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OUR FILE NO. :

January 25, 2000

VIA FACSIMILE & U. S. MAIL
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2000 JAN 26 P 2:14
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Mr. Dennis Dickerson
Executive Officer
Regional Water Quality Control
Board/Los Angeles
320 W. 4th Street
Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

This is submitted on behalf of the Cities of Alhambra, Compton, El Segundo, Lomita, Hawthorne, Torrance, Industry and Santa Clarita. Those Cities appreciate what appears on initial review of the January 18, 2000, Staff Report and Record of Decision to be continued improvements and refinements. However, please note the language "what appears on initial review...." This language was used to make the point that time has permitted only a most preliminary review. There has been insufficient time for Cities, to say nothing of those who will be affected by the SUSMP, to make any kind of detailed analysis, much less to prepare comments for the Board's consideration and your staff's evaluation.

Of course there has been no opportunity to evaluate the "Change Sheet" and the impact of "clarifications" in that document which, to my knowledge, is not yet available for public review. It is for these reasons, as a matter of procedural due process, that I am constrained to now ask you and the Board to delay this item until March, 2000, at the earliest. Recitals of the notice provided for earlier versions of the SUSMP are interesting, but they are no substitute for adequate notice of the latest changes. We must make the point that the adequacy of

notice is not determined by averaging the notice given to all prior versions of the SUSMP, it depends on how much notice was provided as to the version which is to be adopted, with all modifications, including those in the January 18, 2000, Staff Report and Record of Decision and the yet-to-be promulgated Change Sheet.

Please print this Facsimile and include it, in its entirety (and not just as a summary), in the administrative record of this matter as comments by the Cities of Alhambra, Compton, El Segundo, Lomita, Hawthorne, Torrance, Industry and Santa Clarita, and each of them.

In addition, the Cities of Alhambra, Compton, El Segundo, Lomita, Hawthorne, Torrance, Industry and Santa Clarita, and each of them, reserve the right to address the Board at the Meeting and Hearing on January 26, 2000, or any adjourned or continued meeting and hearing.

Sincerely,

STEPHEN R. ONSTOT
OF BURKE, WILLIAMS & SORENSEN, LLP

Cc: Affected City Attorneys

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OUR FILE NO.
00006-0876; 01047-0011
00111-0639; 00408-0051
03478-0001; 00219-0117
02012-0181; 01518-0027

January 14, 2000

RECEIVED
JAN 18 2000
BY:----------

VIA FACSIMILE TO: (213) 576-6600
and (213) 576-6640

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board-Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Re: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

The undersigned hereby requests the opportunity to speak on behalf of the cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance at the Public Hearing on the Standard Urban Storm Water Mitigation Plan at the Board's meeting on January 26, and any dates to which it may be continued.

Very truly yours,

RUFUS C. YOUNG, JR.
of BURKE, WILLIAMS & SORENSEN, LLP

RCY

cc: City Managers/Administrators, Public Works Directors, Planning Directors and City Attorneys of the Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance

LA #39464 v1

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OUR FILE NO. :
00006-0875; 01047-0011
00111-0539; 00408-0051
03476-0001; 00219-0117
02012-0181

January 11, 2000

VIA FACSIMILE TO: (213) 576-6600
and (213) 576-6640

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board-Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Re: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

For the record, please make the SUSMP comment letter submitted by this firm for the Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance, dated January 5, 2000, in its entirety, part of the administrative record in this matter, as comments filed by ***each*** of the foregoing cities. In addition, when you respond to comments, please indicate that the comments in that letter were the comments of those cities, and each of them, and not those of my law firm, which simply represents those cities.

Very truly yours,

RUFUS C. YOUNG, JR.
of BURKE, WILLIAMS & SORENSEN, LLP

RCY

Ref#: 39198

R0068969

cc: City Managers/Administrators, Public Works Directors, Planning Directors and City Attorneys of the Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance

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2000 JAN 12 P 1:18

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LOS ANGELES REGION

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OUR FILE NO. :
00006-0875; 01047-0011; 00111-0539; 00408-0051; 03476-0001; 00219-0117; 02012-0181

January 5, 2000

VIA FACSIMILE TO: (213) 576-6600
and (213) 576-6640

Mr. Dennis Dickerson
Executive Director
California Regional Water Quality Control Board-
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Re: Standard Urban Storm Water Mitigation Plan; Comments and Request for Recirculation

Dear Mr. Dickerson:

This letter offers comments on the proposed Standard Urban Storm Water Mitigation Plan ("SUSMP") as revised and dated December 7, 1999. This letter is submitted on behalf of the Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance. We congratulate you and your staff on the considerable improvements in the revised SUSMP, but believe that a great deal more remains to be done. In view of the number and complexity of our comments and those of others, and the costs of implementation of the SUSMP, we urge you to defer adoption of the SUSMP until it can be recirculated for comment following incorporation of suggested revisions. With that said, the following comments are offered for your consideration.

General Comments

1. Action on the two new categories added in the December 7, 1999, revision of the SUSMP, i.e., "Location adjacent to or discharging to an Environmentally Sensitive Area" and "Parking Lot for 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff" should be deferred to permit considered and thoughtful analysis. As I trust you understand, the revised SUSMP did not reach the hands of a number of staff persons in a number of cities until the December holidays were upon us. Thus time has been limited for the sort of analysis which a document of this importance merits.

2. General Comment: The SUSMP should not, as a matter of law, apply to storm water runoff which flows directly from the roofs of structures into the storm water system, without flowing across a source of pollutants, such as a parking lot, because no pollutants are implicated in such runoff. It is for this reason that the US EPA has exempted such runoff. See, e.g., the exemption of office buildings and associated parking lots separate from industrial activities from the US EPA's definition of *Storm water discharge associated with industrial activity,* found in 40 C.F.R. § 122.26(b)(14).

3. General Comment: The definitions should appear in alphabetical order.

4. General Comment: Where a defined term is drawn from another source, the specific source, such as a particular section of the CEQA Guidelines, should be cited. This would permit those who will implement, and judges who may be called upon to construe, the SUSMP to appreciate the context and the intended meaning.

5. General Comment: The SUSMP should be consistent in the use of the term "storm water" (two words), as used by US EPA, and not "stormwater."

Comments on Specific SUSMP Requirements

6. The new parking lot category should include a credit (against the threshold size of 5,000 square feet) for use of vegetation and planted parking lot islands. As the SUSMP is drafted, there would be a negative incentive for installing a vegetated parking lot if the island (oasis?) would cause the parking lot to exceed 5,000 square feet.

7. Requirement 1 uses the terms "rates" and "levels" interchangeably, but these are not interchangeable terms. Moreover, "foreseeable" is one thing, "reasonable foreseeability" is yet another. **Please revise the requirement to state "Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development *rate* for developments where it is *reasonably* foreseeable that the increased peak storm water discharge rate *will* result in increased downstream erosion.**

8. In Requirement 2, "CONSERVE NATURAL AREAS" on page 5 of 17, in the first bullet, "Every effort shall be made to concentrate or cluster development..." should be changed to "When feasible, development should be concentrated or clustered..." Reason: the term "Every effort..." is absolute and it could give rise to arguments that it means maximum effort, regardless of cost or aesthetics, and permits no flexibility. An attempt to impose such an absolute requirement might invite claims that such a restriction on land use constitutes a taking of private property for public use. Recall that what is at issue here is the imposition of governmental requirements, for public use, on private property, i.e., a "taking.".

9. In Requirement 6, on page 7 of 17, in the interest of clarity, the first bullet should be revised to read "Materials which would contribute pollutants to the storm water system shall be placed...."

10. In Requirement 8, beginning on page 7 of 17, no legal authority is cited in the SUSMP, nor are we aware of any legal mechanism for a local government Permittee to enforce the requirement that "This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any treatment control BMPs to be included in the sales or lease agreement for that property and will be the owner's responsibility." Moreover, the just-quoted sentence is ambiguous. To which transfer does the term "This transfer" refer? The "all properties" transfer in the first part of the preceding sentence? Or does "This transfer" refer to the transfer to the public entity? What if the sales or lease agreement ***does not*** include those BMP maintenance terms? Please explain, and the SUSMP should make clear just what authority the Board contemplates would serve as a legal basis for a Permittee City to take remedial action against a private party. Against a public entity which is a state agency? What standing, in what forum, would a Permittee City have?

11. In E.1, on page 12 of 17, in the interest of clarity, please revise the last part of the first sentence to read "...that are deposited on parking lots by motor vehicles." Please also revise the first bullet to read: "Minimize, to the extent consistent with other laws (e.g., those requiring handicapped parking) the impervious coverage of parking lots, while allowing credit for the installation of vegetation strips and parking lot islands planted with trees and other vegetation."

12. The definition of "Redevelopment" should be revised to expressly exempt *de minimis* increases.[1] For example, adding a flat, vertical sign to the side of a building, which sign increases the square footage by 24 square inches should not trigger the applicability of the Redevelopment SUSMP. Consider revising the SUSMP to expressly state, as we believe that, as a matter of law it must, that it would apply only in cases in which the redevelopment adds more than a given *de minimis* percent of impervious surface.

Comments on Definitions

In many respects, the definitions are the heart of the SUSMP, as it is the definitions which will establish just what must be done and the instances in which it must be done. For that reason, the definitions must be as free from ambiguity as possible. With that in mind, the following comments are offered.

---

[1] Please be aware that the Supreme Court of the United States stated in *Wisconsin Department of Revenue v. William Wrigley, Jr., Co.*, 505 U.S. 214, 231, (1992), "de minimis . . . is part of the established background of legal principles against which all enactments are adopted, and . . . which all enactments are deemed to accept."

13. The definition of **"100,000 Square Foot Commercial Development"** is less than clear, because the current wording seems to say neither lot size nor building footprint is the right way to measure the 100,000 square feet. If "total impermeable area" is to be the measure, the definition should say so directly. **Consider revising the definition to state "100,000 Square Foot Commercial Development" means any commercial development which makes at least 100,000 square feet of land, including land covered by structures, impermeable to infiltration where storm water flows may come into contact with pollutants before flowing into a storm drain, or without first flowing across a per*meable* land area (*e.g.* a lawn).**

14. The inclusion of the undefined term "primarily engaged" in the definition of "Retail Gasoline Outlet" is somewhat vague. Consider revising the definition to read **"Retail Gasoline Outlet" means any retail business which derives *more than 50% of its average annual gross receipts* from the combined sales of gasoline, lubricating oils, tires, batteries, other automobile parts, and automotive services.**

15. As drafted, the definition of **"Parking Lot"** would include unpaved overflow parking areas, which don't create significant, if any, runoff. It would also include areas used even occasionally for parking. It would also seem to include parking buildings with roofs, the runoff from which is, or should be, generally exempt, as no pollutants are implicated. We suggest that the definition be revised to state: **"Parking Lot" means *any area of land made impermeable to infiltration* the primary purpose of which is the temporary parking or storage of motor vehicles used personally, in business, or in commerce.**

16. The definition of "Best Management Practice (BMP)" imposes too heavy a burden of proof of effectiveness of BMPs, the effectiveness of which is open to debate. As drafted, the definition requires that BMPs, "...when implemented prevent, control, remove or reduce pollution." Worthy objectives to be sure. Considering how hard it is to measure non-point source water pollution and to determine the causes of the pollution, it is unfair, and probably a denial of due process, to require cities to adopt BMPs which they must be prepared to prove, in defending a suit under the Clean Water Act, were effective. It should be enough that a city has a reasonable belief that its BMPs are as likely as any others to reduce this pollution. The definition of "Source Control BMP" recognizes this point by requiring only that practices "***aim to***" prevent stormwater pollution by reducing the "***potential***" for it. It is recommended that the definition of **"Best Management Practice (BMP)" be revised to state that it means the use of methods, programs, processes, technologies, engineered systems, or siting criteria which *are reasonably believed and intended to* prevent, control, remove, or reduce pollution.**

17. The definition of **"Directly Connected Impervious Area"** should be revised, for the reasons stated in comment 2, above. If the storm water runoff flows directly into the storm water system without first coming into contact with sources of pollutants, such as petroleum drippings from incontinent motor vehicles sometimes found on parking lots, the storm water flow should be

exempt. Consider revising the definition to state **"Directly Connected Impermeable Area" means *land* covered by *impermeable* pavement, *or* other impermeable surfaces where storm water flows may come into contact with pollutants before flowing into a storm drain, or without first flowing across a permeable land area (*e.g.* a lawn).**

18. The definition of **"New Development"** should be revised. Consider revising the definition to read **"New Development" means the process of subdividing land and then disturbing it substantially, either by making it impermeable to infiltration, by building structures where storm water flows may come into contact with pollutants before flowing into a storm drain, without first flowing across a permeable land area (*e.g.* a lawn).**

19. The definition of **"Redevelopment"** is flawed, as it would seem to apply to remodeling and maintenance activities which have no impact on storm water runoff. Consider revising the definition to state **"Redevelopment" means an enlargement of the area of impermeable *horizontal* surfaces, on an already developed site, such as by building new structures or substantially enlarging existing ones, *which is neither de minimis nor the result of routine maintenance,* where storm water does not drain directly into a storm drain but where the storm water flow comes into contact with pollutants and then flows into a storm drain, without first flowing across a permeable land area (*e.g.* a lawn).**

The cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance commend your considerable efforts. More remains, and we ask you to give thoughtful consideration to the foregoing comments.

Very truly yours,

RUFUS C. YOUNG, JR.
of BURKE, WILLIAMS & SORENSEN, LLP

RCY

cc: City Managers/Administrators, Public Works Directors, Planning Directors and City Attorneys of the Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance

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LOS ANGELES REGION

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TELECOPY MESSAGE

TO: Dennis Dickerson, CRWQCB

DATE: 11/29/99

FROM: Rufus C. Young, Jr., Esq.

ACCOUNT #: 00006-0875

SUBJECT: Request for Delay

FAX #: 213/576-6640

TOTAL NUMBER OF PAGES (INCLUDING THIS PAGE): 4

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TIME SENT:

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DATE: 11/29

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OUR FILE NO.
00006-0876, 01047-0011
00111-0539, 00408-0051
03476-0001, 00219-0117
02012-0181

November 29, 1999

VIA FACSIMILE TO: (213) 576-6600
and (213) 576-6640

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board-Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Re: Standard Urban Storm Water Mitigation Plans; Request for Delay in Issuance in Light of Phase I Storm Water Efficiency Reports Required by Recent Legislation

Dear Mr. Dickerson:

This letter requests that you delay issuance of the proposed Standard Urban Storm Water Mitigation Plans ("SUSMPs") As you may already be aware, § 431 of PL 106-74, which the President signed on October 20, requires the Administrator of the U.S. EPA to make two reports to Congress. Within 120 days after PL 106-74's enactment, EPA must report on its "Phase I" storm water regulations to the Senate Committee on Environment and Public Works and to the House Committee on Transportation and Infrastructure. EPA must also report to these committees before publishing its "Phase II" storm water regulations. The agency must publish both reports in the Federal Register for public comment.

The report on the "Phase I" storm water regulations must ***explain in detail*** what improvement, if any, they have caused in national water quality. This report must describe specific measures which have or have not been successful.

The "Phase II" storm water report must contain four elements. First, it must analyze the likely effect of the regulations on urban, suburban, and rural local governments. In particular, EPA must estimate the costs of compliance with six "minimum control measures" in these storm water regulations; and of reducing the construction threshold from five acres to one. Second, EPA must explain why it reduced this threshold, stating what qualitative information it used to determine it. The agency must also explain, "in light of recent court decisions," why it was less arbitrary to choose one acre as its measure, instead of five. (This apparently is a reference to

American Trucking Ass'ns v. United States Environmental Protection Agency, 175 F.3d 1027 (D.C. Cir., 1999).[1] Third, EPA must demonstrate that storm water runoff is generally a problem in cities with populations between 50,000 100,000. In particular, the Administrator must explain why the population of a place, and not its water quality, determines whether it is regulated. Fourth, the report must contain information to support EPA's determination that it should administer the "Phase Two" storm water regulations as part of the NPDES.

Much of what the Congress is requiring of the Administrator quite clearly calls the SUSMPs now under your consideration into question. On behalf of the cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance, I ask you to report to the Regional Board that the Congress has passed legislation requiring the Administrator of the U.S. EPA to prepare "efficiency reports" on the Phase I storm water regulations and on aspects of the Phase II storm water regulations which have provisions parallel to the SUSMPs now under consideration. I further request that you delay, or seek the Board's approval to delay, issuance of the SUSMPs until the EPA Administrator's report is published and can be evaluated For your convenience, a copy of § 431 of Public Law 106-74 is enclosed.

Very truly yours,

RUFUS C. YOUNG, JR.
of BURKE, WILLIAMS & SORENSEN, LLP

RCY

cc: City Managers/Administrators, Public Works Directors, Planning Directors and City Attorneys of the Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance

[1] In the *American Trucking* case, the U.S. Court of Appeals for the District of Columbia Circuit held that the EPA's issuance of certain regulations under the Clean Air Act was based on an interpretation which constituted an unconstitutional delegation of the legislative authority of Congress. The court also held that EPA's selection of PM_{10} rather than some other size of soot as the threshold for regulation, was arbitrary and capricious)

Sec. 431. Promulgation of Stormwater Regulations.

(a) Stormwater Regulations.--The Administrator of the Environmental Protection Agency shall not promulgate the Phase II stormwater regulations until the Administrator submits to the Committee on Environment and Public Works of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report containing-- (1) an in-depth impact analysis on the effect the final regulations will have on urban, suburban, and rural local governments subject to the regulations, including an estimate of-- (A) the costs of complying with the six minimum control measures described in the regulations; and (B) the costs resulting from the lowering of the construction threshold from 5 acres to 1 acre; (2) an explanation of the rationale of the Administrator for lowering the construction site threshold from 5 acres to 1 acre, including-- (A) an explanation, in light of recent court decisions, of why a 1-acre measure is any less arbitrarily determined than a 5-acre measure, and (B) all qualitative information used in determining an acre threshold for a construction site; (3) documentation demonstrating that stormwater runoff is generally a problem in communities with populations of 50,000 to 100,000 (including an explanation of why the coverage of the regulation is based on a census-determined population instead of a water quality threshold); and (4) information that supports the position of the Administrator that the Phase II stormwater program should be administered as part of the National Pollutant Discharge Elimination System under section 402 of the Federal Water Pollution Control Act (33 U.S.C. 1342)

(b) Phase I Regulations.--No later than 120 days after the enactment of this Act, the Environmental Protection Agency shall submit to the Environment and Public Works Committee of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives a report containing a detailed explanation of the impact, if any, that the Phase I program has had in improving water quality in the United States (including [[Page 113 STAT. 1097]] a description of specific measures that have been successful and those that have been unsuccessful).

(c) Federal Register.--The reports described in subsections (a) and (b) shall be published in the Federal Register for public comment.

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TELECOPY MESSAGE

TO: Dennis Dickerson, Executive Officer
CRWQCB-Los Angeles Region

DATE: Nov. 9, 1999

FROM: Rufus C. Young, Jr., Esq.

ACCOUNT #: 00006-0875; 01047-0011
00111-0539; 00408-0051
03476-0001; 00219-0117
02012-0181

SUBJECT: Standard Urban Storm Water Mitigation Plans

FAX #: (213) 576-6600 and
(213) 576-6640 ✓

TOTAL NUMBER OF PAGES (INCLUDING THIS PAGE): 12

NOTE:

TIME SENT: DATE:

OPERATOR'S INITIALS:

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OUR FILE NO.
00008-C875; 01047-0011
00111-C639; 00408-0051
03678-C001; 00219-0117
020?2-0181

November 9, 1999

VIA FACSIMILE TO: (213) 576-6600
and (213) 576-6640

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board-Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Re. Standard Urban Storm Water Mitigation Plans

Dear Mr. Dickerson:

Please accept my apologies for the delay in submitting this set of informal comments on the proposed Draft Standard Urban Storm Water Mitigation Plans ("SUSMPs"). These comments are submitted on behalf of the Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance

Here are some of the items in the SUSMPs which, in my view, raise serious legal issues:

1. In the "**BACKGROUND**" section of each SUSMP, in the second paragraph, the sole legal basis given is the 1987 amendments to the Clean Water Act. If a City were to attempt to defend its reliance on the Storm Water Permit, (and it may, if a developer says "you can't require me do to that.") the City should have all possible legal authority at its disposal. The SUSMPs reliance on only one source, the '87 CWA amendments, is not, in my view, a good legal move. It would put a city in the position of betting the outcome of the lawsuit on one, but only one, source of authority. The corrective action I'd cite the federal and California Constitutions, Porter-Cologne, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and the Health & Safety codes, too.

2. In the "**BACKGROUND**" section of each SUSMP, in the third paragraph, the third sentence is directive in nature: "This SUSMP outlines ***the necessary*** Best Management Practices (BMPs) which ***must*** be incorporated into design plans for [name of SUSMP] projects." Please note that the sentence does not say "some of which" or "Cities may select the appropriate measures from among..." This language, unless modified, it could be argued, leaves a **City with no discretion at all:** a City would have to require that **all measures in a SUSMP** must be incorporated into all design plans for that type of development. Yes, that may not be what was intended. But it could be argued to be the plain meaning of what is in the SUSMPs, and that is how a judge might construe it. The fix: Make it clear that the SUSMPs contain BMPs which, as **appropriate**, are among those which a City may require of a developer. Add a variance procedure, to deal with the inevitable situation when none of the BMPs will work.

3. In Section 3 ("PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE") (a requirement in every SUSMP), in the second bullet point: no hint is given that anything less than placement of signs along ***every*** channel and ***every*** creek, both upstream and downstream, ***from the mountains all the way to the sea***, is what is required. Am I making this up? No (Remember, in 2, above, the language is directive: "...***the necessary*** Best Management Practices (BMPs) which ***must*** be incorporated ...") Just how a developer is to gain access to a stream bank owned by a third party, to place those signs, is also not explained. The "takings issues" (of private riverfront property for the public use of erecting the signs, without just compensation) and First Amendment problems (forcing, somehow, property owners of property adjacent to streams to be unwilling hosts of forced speech, i.e., the anti-dumping signs) raise possibly insurmountable Constitutional issues. The correction: Make it clear that the sign requirement is among those which may be appropriate, but that it is limited to those streams and storm drains adjacent to the project in question.

4. The design requirements of the SUSMPs should be reviewed by Building Officials and Fire Departments for consistency with UBC, UFC, etc..

5. As to "BMP MAINTENANCE" requirements, the requirement to have the developer "sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred" is a nice concept, but enforcement would be difficult or impossible. If the "statement" is not a contract, it could be argued that the City has no standing to enforce the "statement." As to maintenance after the transfer of property, the notion that the City, through the use of the "statement," could require the seller to impose conditions on a buyer, which

are not part of any CUP, contract or ordinance could be viewed as an unconstitutional restraint on alienation, and could subject the City to a "takings" claim under the federal and state constitutions. Enforcing this "condition" against the buyer, or worse yet, the third or fourth buyer down the chain of title, without benefit of a CUP, CEQA mitigation requirement or ordinance, could be difficult at best. Suggestion: Recall that these SUSMPs are to apply only to discretionary projects, triggering, one assumes, CEQA. If so, make these conditions CEQA mitigation requirements. And make them part of any CUP, if a CUP is required. In addition, and of great concern, is that the SUSMPs do not provide for any sort of funding mechanism for the new roles thrust upon the Cities in the area of enforcement of SUSMP maintenance enforcement.

In summary, some problems may be encountered with the present methodology. Some of the language is, I think, overbroad. (The wrong saddle on the right horse.) There are other ways to accomplish the goals. I hope these initial comments are helpful. I have also taken the liberty of preparing a revised sample SUSMP It is enclosed.

The Cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita and Torrance wish to make clear that the submission of these comments on their behalf should not be construed as a waiver of further comments, or at to the right to raise any further objections to the Draft SUSMPs

Very truly yours,

RUFUS C. YOUNG, JR.
of BURKE, WILLIAMS & SORENSEN, LLP

RCY

RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption. The term "restaurant" includes, but is not limited to ~~including~~ stationary lunch counters and refreshment stands ~~selling~~ where prepared foods and drinks are sold for immediate consumption. (All facilities within SIC code 5812 are included in the term "Restaurant.")

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) (NPDES No. CAS614001) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, ~~required~~ requires the development and implementation of a program addressing ~~stormwater~~storm water pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on, among other things, ~~the primary objectives of~~ Section 402(p) of the Clean Water Act, the Coastal Zone Act Reauthorizations Amendments of 1990 ("CZARA"), the California Water Code, the Comprehensive Enviromental~~Environmental Response, Compensation and Libility~~Liability Act ("CERCLA"), 42 U.S.C. §§ 9601, et seq., and the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901, et seq. ~~t~~The 1987 amendments to the Clean Water Act ~~that~~ established a framework for regulating ~~stormwater~~storm water discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives of the Municipal Storm Water requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from ~~stormwater~~storm water conveyance systems to the Maximum Extent Practicable.

This Standard Urban ~~Stormwater~~Storm water Mitigation Plan (SUSMP) was developed as part of the program to addressing Development ~~Planning for~~ by the private sector. The Permittees are to~~will use this~~ SUSMPs as guides for development into ~~develop~~ their ~~own~~ respective ~~city~~ jurisdiction-wide SUSMPs. The SUSMPs apply only to Discretionary projects (as defined by CEQA), that fall into one of the seven categories: (10-99 Home Subdivision, 100- Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant). Permitees are to require project proponents~~will need~~ to implement, to the extent practicable, ~~the appropriate~~ appropriate SUSMP requirements into ~~their~~ project plans. This SUSMP outlines ~~the necessary~~ Best

Management Practices (BMPs) which must be considered for possible ~~incorporated~~ incorporation, to the extent practicable, into design plans for Restaurant projects. Should any SUSMP provision conflict ~~be discovered with the new guidelines and~~ any pre-existing regulation or ordinance, such as, for example, a Building Code requirement, the pre-existing regulation ~~will~~ shall control ~~prevail~~.

For development projects where the cost of new improvements exceeds a ~~pre-determined~~ threshold determined by the Permitee, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the ~~pre determined~~ threshold determined by the Permitee, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate ~~may~~ foreseeable will cause ~~result in an increased potential for~~ downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, ~~the~~ project plans must include those BMPs which are practicable to implement and which are consistent with ~~local~~ the Permitee's codes and ordinances, to decrease the potential of slopes and/or channels from eroding and impacting ~~stormwater~~storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- With approval of all agencies with jurisdiction, e.g., the Army Corps of Engineers and the California Department of Fish & Game, ~~Install~~ install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels

that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids ~~to the~~ a ~~stormwater~~storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following requirements, consistent with building codes:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer or retention tank.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer or retention tank.

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4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the ~~stormwater~~storm water conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All new storm drain inlets and catch basins constructed as part of the project not already ~~stencilled~~stenciled, must be stenciled with prohibitive language (such as: "NO DUMPING - DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along the portion of channels and creeks, if any, which are adjacent to the project, if it is preacticablepracticable to obtain legal approval from the property owner.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors ~~can~~ could allow ~~toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids~~ pollutants to enter the ~~stormwater~~storm water conveyance system. Where proposed project plans or activities ~~may result in~~ include outdoor areas for storage or uses ~~of materials~~ that may contribute pollutants to the ~~stormwater~~storm water conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

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- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas on projects subject to this SUSMP must meet the following requirements:

- ~~Trash container areas must have drainage~~Drainage from ~~adjoining~~ roofs and pavement shall be diverted around trash container areas~~the area(s)~~.
- Trash container areas must be screened or walled to prevent unintended off-site transport of trash.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittees ~~staff~~ will require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to structural ~~dseign~~design, legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

~~For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.~~

If structural BMPs are located within a public area proposed for transfer of title to a public agency, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. ~~The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.~~

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TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area ~~Stormwater~~Storm water Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area ~~Stormwater~~Storm water Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of ~~Stormwater~~Storm water Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different ~~stormwater~~storm water filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323

R0068990

Design Manual for Use of Bioretention in ~~Stormwater~~Storm water Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of ~~Stormwater~~Storm water Management (1997) Provides a thorough look at ~~stormwater~~storm water practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

R0068991

Arroyo Verdugo Cities

Burbank - Glendale - La Canada Flintridge

January 13, 2000

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality
Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Dear ~~Mr. Dickerson~~, DENNIS

A Chairman of the Arroyo Verdugo Steering Committee, I wish to share my written opposition to the proposed numeric storm water retention/treatment requirements presented by the California Regional Water Quality Control Board, Los Angeles Region. I understand the revised SUSMP addresses some of the recently expressed concerns, but I believe the changes have made the SUSMP more stringent encouraging the cost of development.

The Arroyo Verdugo Steering Committee has met several times to discuss this issue and has worked to state their opposition in the attached draft resolution. The action to adopt the resolution was placed on our January agenda, but due to lack of quorum the Committee was unable to make the vote official. The Committee is looking to meet again prior to your January 26 Regional Board meeting, and if the resolution is adopted, an Arroyo Verdugo Cities staff member will present the document at your meeting.

Please accept my gratitude for taking the time to consider these comments. It is my intent to help develop effective standards without compromising water quality.

Sincerely,

Bill Wiggins
Chairman, Arroyo Verdugo Cities
Vice-Mayor, City of Burbank

DENNIS - HOPE TI SEE YOU SOON - IT'S BEEN A LONG TIME SINCE YOU WERE AT AUTOMATION PLASTIC

R

C: Arroyo Verdugo Steering Committee

R0068992

1327 Foothill Boulevard, La Canada Flintridge, CA 91011 PH: (818) 790-8880 FAX: (818) 790-7536

RESOLUTION NO. 21

A RESOLUTION OF THE ARROYO VERDUGO CITIES COUNCIL OF GOVERNMENTS ADVISING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, OF ITS INTENTION TO PETITION THE STATE WATER RESOURCES CONTROL BOARD FOR RELIEF FROM UNREASONABLE RUNOFF POLLUTION CONTROLS FOR NEW DEVELOPMENTS

Whereas, the Arroyo Verdugo Cities Council of Governments (hereinafter "Arroyo Verdugo COG"), is a sub-region of the Southern California Association of Governments, consisting of Burbank, Glendale and La Canada Flintridge;

Whereas, on September 16, 1999, the California Regional Water Quality Control Board, Los Angeles Region (hereinafter "regional board") convened a public hearing to discuss requiring cities in Los Angeles County to impose stringent numeric storm water retention/treatment requirements (hereinafter "numeric requirements") on certain categories of new developments, through so-called Standard Urban Storm Water Management Plans (hereinafter "SUSMPs") -- a requirement of the development planning program component of the NPDES permit;

Whereas, such numeric limits were intended to retain or treat about 80-85% of runoff from the subject new developments, which include 10-99 home sub-divisions, 100-plus home sub-divisions, and 100,000 square foot commercial developments;

Whereas during aforementioned public hearing, 50 cities expressed opposition to the proposed numeric storm water retention/treatment requirements because of the following:

i. they were inflexible to the extent cities that cities would have been required to meet the numeric standard, even if it were difficult or possible to do so because of economy, practicality, or the new risk of creating another environmental problem;

ii. they were largely based on a settlement agreement between County of Los Angeles and the Natural Resources Defense Council;

iii. they were targeted at reducing oil, grease, and unspecified metals without specifying the purpose of such a stringent requirement, such as protecting a beneficial use of particular a receiving water (e.g., ground-water recharge areas of the Los Angeles and San Gabriel Rivers);

iv. they would have been the most stringent new development runoff pollution control requirement in the State; and

v. they are not authorized either under the NPDES permit or the development planning program, which calls for SUSMPs.

Whereas on September 16, 1999, the Executive Officer of the regional board recommended to continue discussion of this issue to another time, now set for January 26, 2000;

Whereas, on December 7, 1999, the Executive Officer issued a revised SUSMP and proposed its adoption through a tentative RESOLUTION APPROVING THE RECORD FOR STANDARD URBAN STORM WATER MITIGATION PLAN FOR MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS IN LOS ANGELES COUNTY;

Whereas, although the revised SUSMP addresses several of the concerns expressed in the Arroyo Verdugo Cities COG resolution, it made the SUSMP more stringent by requiring a numeric-based design standard for retaining or treating runoff from ANY PARKING LOT WITH 25 OR MORE SPACES OR GREATER THAN 5000 SQUARE FEET -- instead of requiring a numeric standard just for housing sub-divisions and 100,000 square feet commercial developments as initially called proposed;

Whereas, if approved, the revised SUSMP would increase the cost of development to a higher level than was initially considered by the regional board, notwithstanding the absence of any scientific evidence demonstrating that the more stringent requirements would result in a tangible improvement of water quality for any receiving water;

NOW, THEREFORE, the Arroyo Verdugo Cities COG does hereby resolve as follows:

Section 1. Advise regional board members of its opposition to the regional board's proposed tentative resolution;

Section 2. Recommend that the regional board approve the Standard Urban Storm Water Mitigation Plan, which does not include broad numeric limits, as proposed by the Executive Advisory Committee on August 11, 1999;

Section 3. Notify the regional board that if it or its Executive Officer adopts any requirement calling for a numeric standard to treat or retain storm water runoff from any development project, or controlling runoff from a surface area of any new development, without the consent of the Arroyo Verdugo Cities COG, that this COG shall, within 30 days of the action, prepare a petition with the State Water Resources Control Board enabling its members to challenge such action.

Adopted this 21st day of January, 2000.

Chair, Arroyo Verdugo Cities

Attest:

Executive Director

R0068994

State of California, County of Los Angeles

I, NINA POTTER, Executive Director for Arroyo Verdugo Cities, certify that the foregoing resolution was adopted by the Arroyo Verdugo Cities Steering Committee, representing the cities of Burbank, Glendale and La Canada Flintridge, by a majority of the members thereof, at its special meeting held on the 21st day of January, 2000, and that the same was adopted by the following vote:

Ayes:	Wiggins, Liu
Noes:	None
Absent:	Baker

Nina Potter

Executive Director

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
CITY OF BURBANK

00 JAN 24 AM 11:56

City of Azusa
Department of Community Development
Engineering Division

August 31, 1999

Mr. Dennis Dickerson
Executive Officer
CRWQCB - LA
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

RE: OPPOSITION TO SUSMP NUMERIC LIMITS

Dear Mr. Dickerson:

The City of Azusa has reviewed the proposed SUSMP numeric limits by the Board and objects to their inclusion in the development planning modal program. As we have pointed to other aspects of the current NPDES permit, certain permit requirements are imposed on the Cities without an appropriate cost to benefit studies. In rush to impose more and more regulations, regulatory agencies often neglect to consider the economic side of the requirements.

County of Los Angeles Cities should not contend with numerical limits, while the Cities in the neighboring Counties of Orange and Riverside do not. These limits invite an inherent regional inequity to Southern California.

In fact, no other municipal permit in California requires numerical limits for the retention or treatment of storm water run-off. The LA region permit has led the State in controversy from the date it was adopted. We should allow the approved model programs take effect, without the numerical limits, and properly assess their effectiveness on the water quality before over-burdening the LA region with additional requirements.

In case of questions, please feel free to call me at 626/812-5261.

Sincerely,

Nasser Abbaszadeh
City Engineer

R0068996

BALDWIN
P · A · R · K

January 12, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board, Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

SUBJECT: STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP)

Dear Mr. Dickerson:

The City of Baldwin Park appreciates the challenges that the Regional Board has encountered during the development of the Planning and Development guidelines for the cities of the Los Angeles Region. The City is also continuously faced with many policy-making issues which are often controversial or difficult to implement due to various social or economic reasons. Through this process, the City is continuously updating and reviewing its policies to ensure the community's quality of life as well as the protection of its natural resources. It is from this point of reference that we believe the overall goal of imposing SUSMP requirements on new development and redevelopment must be practical, efficient and feasible to effectively mitigate pollution in stormwater and urban runoff.

As an environmentally-concerned community, we wish to support the Board and its staff in establishing basic and realistic SUSMP standards, which also allow the use of alternative mitigation methods that achieve the same result, if found to be necessary or appropriate due to site specific limitations. Such an approach, we believe, would effectively meet the goals of the SUSMP program in an effective and reasonable manner. The City is continuing to implement its current SUSMP requirements and will progressively assess their outcomes. This will continue to be a very dynamic and progressive procedure that will only improve with time and experience.

R0068997

CITY OF BALDWIN PARK · 14403 EAST PACIFIC AVENUE · BALDWIN PARK · CA · 91706 · (626) 960-4011 · FAX (626) 962-2625

The City of Baldwin Park believes that it is a partner with the Regional Board in the protection of the Region's environment and looks forward to the development of SUSMP standards which meet the mutual goals of our two agencies. Should you have any questions related to this matter, or if you desire any information related to the City's stormwater/urban runoff program, please feel free to contact me.

Sincerely,

Wendy Lemm-Harris
Public Works Supervisor, Environmental Services Division

CITY OF
BELLFLOWER

16600 CIVIC CENTER DRIVE
• BELLFLOWER, CALIFORNIA 90706-5494
(562) 804-1424
FAX (562) 925-8660

September 1, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: Opposition to SUSMP Numeric Limits

Dear Mr. Dickerson:

The City of Bellflower understands that the Regional Board will be considering incorporating numeric limits into the Standard Urban Stormwater Mitigation Plan (SUSMP) at its September 16, 1999 meeting. The numeric limits proposed by Regional Board staff are aimed at retaining and/or treating .75" of storm water during a 24-hour storm event for seven (7) categories of new developments. The City also understands that the County of Los Angeles — the principal permittee under the Los Angeles County Municipal NPDES Permit ("NPDES permit") — has already agreed to this standard by way of its settlement agreement with the environmental community.

The City writes to inform you of its opposition to this proposed requirement for the following reasons:

- No other municipal permit in California requires a numeric limit for the retention or treatment of storm water runoff.

- Although other counties in California, such as Alameda and Ventura, require post-construction controls for new developments, they afford cities broad discretion in determining which types of projects and structural controls to impose on developers.

- If approved, the numeric limits would require cities to impose upon seven (7) types of new development costly structural controls (infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof), without regard for whether such controls are needed or whether they would be effective or necessary insofar as protecting a beneficial use of receiving water.

R0068999

JOE CVETKO, Mayor
RANDY BOMGAARS, Mayor Pro Tem
RUTH GILSON, Councilwoman
JOHN PRATT, Councilman
RAY SMITH, Councilman

- The structural controls required to meet a numeric retention/treatment limit would 1) require a high degree of maintenance, which cities would be responsible for enforcing; and 2) if not properly maintained, could become sources of pollution rather than pollution mitigants.

- The numeric limits constitute an unfunded state mandate and have not been evaluated for cost-effectiveness --as required under California Law.

- The numeric limits now being considered were not based on science or engineering, but on a negotiated agreement, and are therefore arbitrary.

- The structural controls necessitated by numeric limits would be required without regard to siting factors (soil conditions and other environmental considerations).

- The use of some structural controls such as detention basins/ponds and vegetative buffers are even more undesirable because they reduce the amount of developable area.

Given the aforementioned problems, the absence of numeric limits in the SUSMP's would be in the interest of this and other cities. In addition, cities should be allowed sufficient time to allow the Council of Government (COGs) to review and comment on NPDES permit issues. Since the COGs meet monthly, thirty (30) days notice is simply not enough time for member cities to take action on such important issues.

As you may also be aware of, two (2) years ago the Southern California Association of Governments (SCAG) petitioned the State water Resources Control Board to involve it and its sub-regional COGs in the discussion of the NPDES permit matters. This action was taken because storm water management is an important regional planning issue that demands the involvement of SCAG, a regional planning agency.

Sincerely,

Michael J. Egan
City Administrator

cc: file

CITY OF BURBANK
PUBLIC WORKS DEPARTMENT
275 EAST OLIVE AVENUE, P O BOX 6459, BURBANK, CALIFORNIA 91510-6459

JAN 1 8 2000

January 13, 2000

VIA FAX
(213) 576-6640

Dr. Xavier Swamikannu
Storm Water Program
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: PROPOSED STANDARD URBAN STORM WATER MITIGATION PLAN PUBLIC HEARING

Dear Dr. Swamikannu:

This is to notify you that the Arroyo Verdugo Cities Council of Governments (COG) would like to speak at the subject public hearing on January 26, 2000. We anticipate that Bruce S. Feng, Public Works Director for the City of Burbank, or his designee, will represent this COG. He will require approximately three (3) minutes of speaking time.

Thank you.

Sincerely,

Bruce S. Feng
Public Works Director

BSF:pf

cc: Elroy Kiepke, Acting Public Works Director, La Cañada Flintridge
Kerry Morford, Public Works Director, Glendale
Nina Potter, Executive Director, Arroyo Verdugo Cities

R0069001

Malibu Creek Watershed Management Committee

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
Regional Water Quality Control Board, Los Angeles Region
320 W. 4th St , Suite 200
Los Angeles CA 90013

SUBJECT: SUSMP Policy and Implementation

Dear Mr. Dickerson:

The Malibu Creek Watershed Management Committee (WMC) decided the following on its January 13, 2000 meeting:

1) The Malibu Creek WMC supports the revised SUSMP that had been worked on by several parties but was removed from discussion this week. This version provides flexibility, but also requires specific water quality actions that will result in restored beneficial uses of our waterways.

2) The Malibu Creek WMC supports the policy statement approved by Southern California Association of Governments (SCAG) as the implementation counterpart of the SUSMPs, including the idea of using a Total Maximum Daily Load (TMDL) driven numeric standard rather than a volume based numeric standard. We also encourage the Regional Board to make the SCAG policy more formal by adopting a revised resolution, commit and coordinate resources as outlined in the policy, and direct staff to use TMDLs for developing the numeric standard.

3) The Malibu Creek WMC wishes to express its concern over the letter dated December 22, 1999 from Rutan and Tucker regarding objections to the SUSMPs. The Executive Advisory Committee (EAC) did vote to have a formal presentation on three aspects of the SUSMP issue to the Regional Board members during the SUSMP agenda item, the legal aspect being one of the three. However, the EAC did not review the contents of the letter prior to Rutan and Tucker sending it to you. The Malibu Creek WMC believes it inappropriate for that firm to say it is acting on behalf of the EAC

when the contents and tone of the letter were not made available to the group to discuss, edit as appropriate, and vote upon.

Thank you for your time and consideration.

Sincerely,

Tim Plasky, Chair
Malibu Creek Watershed Committee

cc: **Honorable Regional Board Members**
City of Agoura Hills, Jedediah Ireland
City of Calabasas, Heather Lea Merenda
City of Malibu, Richard Morgan
City of Westlake Village, Jim Taylor
Chair, Ballona Creek Watershed
Chair, Los Angeles River Watershed
Chair, Dominguez Channel Watershed
Chair, San Gabriel River Watershed
Chair, Santa Clara River Watershed
Chair, Executive Advisory Committee

To: Regional Council

From: Daniel E. Griset, Sr. Planner (213.236.1985), email: griset@scag.ca.gov

Date: December 15, 1999

RE: Proposed Standard Urban Storm Water Mitigation Plan

RECOMMENDED ACTION:

Adopt the following statement of policy on storm water runoff mitigation.

The Southern California Association of Governments recommends:

- *that the Regional Board encourage pilot programs similar to those underway by Los Angeles County in which the implementation of a numeric standard for runoff volumes produced by new developments can be monitored and evaluated in a various watershed settings.*
- *that the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *that the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *that the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *that the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *that the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *that the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *that the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

SUMMARY:

At its January 26, 2000 meeting the Regional Board will consider new provisions for a storm water runoff mitigation plan with a numeric standard requiring retention and treatment of up to ¾ of an inch of runoff on a specific site. The proposed plan would be inserted into both the new Long Beach storm water permit as well as the existing Los Angeles County permit. The

plan would materially impact many new development and redevelopment sites in Los Angeles County. The EEC is scheduled to consider this same item at its meeting also on January 6.

BACKGROUND:

The current Los Angeles County Storm Water Permit that was issued in 1996 (as well as the City of Long Beach Storm Water Permit issued earlier this year) called for various programs to be developed by the permittees. Among these programs was one for addressing storm water pollution issues that may result from development planning for private projects. In August the Executive Officer of the Los Angeles Regional Board announced a new proposed rule for managing pollution carried by urban storm water runoff from certain new development sites. This rule required that these sites would need to retain and possibly treat up to the first ¾ of an inch of storm water collected on these sites from a 24 hour storm event. At a public hearing on September 16, 1999 local government and private industry responses to this proposal raised many questions and objections to the implementation of a "numeric standard" as an appropriate way to manage pollutants associated with urban storm water runoff. These responses suggested that a numeric standard was a "volume" strategy, not a water quality strategy. A numeric standard dealt with quantities of water rather than with specific pollution problems associated with a given location and general hydrology.

Following the September hearing the Water Policy Task Force scheduled two months of testimony on this issue. A wide cross section of interested parties appeared before the Task Force to give comments and suggestions on the proposed new policy. These parties included local governments in the region who have different approaches for managing this pollution, Caltrans, the storm water specialist from the Regional Board, the building industry association, the National Resources Defense Council, automobile recycling and gasoline station representatives, and a fast food restaurant representative.

In response to this testimony the Task Force instructed staff to pursue informal discussions among the various parties to search for new ideas for improving runoff water quality and preventing more runoff pollution. These discussions were convened and were helpful in highlighting the importance of looking at this runoff pollution problem as a regional or watershed problem (rather than just a problem for specific development sites) and as a problem requiring much better identification (rather than just retaining urban runoff everywhere).

These concerns were presented by Mark Pisano to Dennis Dickerson, Executive Officer of the Regional Board, at a meeting in mid-November. Following that meeting a SCAG memorandum (attached) was sent to the Executive Officer, urging him to implement a watershed management approach with BMP development and monitoring in various locations. From these efforts and with SCAG's assistance the use of a numeric standard could be used as a "backup" policy, not a "front-end" policy, when identified priority pollution problems are not mitigated. This approach would allow solutions to be tailored to actual, identified pollution occurring in specific reaches of waterbodies throughout the County. Similarly, this approach would feature larger-scale solutions (not just site-by-site runoff

volume retention) that more successfully and economically stem runoff pollution and increase the beneficial uses of our region's waters.

Following this consultation with SCAG and many others interested in this issue, Mr. Dickerson issued the attached revised policy proposal on December 7, 1999. This proposal not only maintained the original numeric standard it introduced other new mitigation requirements and provisions. Initially this proposal was scheduled to be considered by the Board on January 6, 2000. In response to widespread concern about the holidays and the conflict with schedules such as our Regional Council on that day, the hearing on this new proposal has now been shifted to January 26.

The Executive Officer's transmittal memo (attached) recommends a sequence of actions: first, the Board would vote to implement the new policy as a part of the Long Beach permit and, second, the Executive Officer would then implement the new policy as a part of the Los Angeles County permit.

Also included for Regional Council review are the following documents: the Summary of Comments Received and Response, the Tentative Draft Resolution for Board consideration, and the slideshow frames from the National Resource Defense Council presentation in November.

CITY OF CERRITOS

CIVIC CENTER · 18125 BLOOMFIELD AVENUE
P.O. BOX 3130 · CERRITOS, CALIFORNIA 90703-3130
PHONE: (562) 860-0311 · FAX: (562) 916-1373

September 9, 1999

OFFICE OF THE MAYOR
GRACE HU

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: **SUSMP Numeric Limits**

Dear Mr. Dickerson:

The City of Cerritos is aware that the Regional Board is considering the use of numeric limits in the Standard Urban Stormwater Mitigation Plan (SUSMP). Cerritos supports the use of Best Management Practices (BMP's) as guidelines that can be customized to suit the needs of individual projects. However, Cerritos has the following specific concerns with this proposal:

- Developers could easily chose to build in neighboring Orange County and still serve the Cerritos area without paying for potential unnecessary structural controls that make part of the property undevelopable.
- The groundwater table in Cerritos is very high. Retention basins or swales have the potential for causing pollutants to leach and contaminate groundwater.
- Cerritos prides itself on the clean and attractive appearance of our City. However, we do not have the staff, experience or budget to support the maintenance required with the structural controls suggested for use in complying with the proposed numeric limit.

Cerritos supports a study of the effectiveness of these controls, as well as a plan to monitor the pollutants found in storm water runoff in our City. Unless the effectiveness and the economic viability of this proposal can be demonstrated, Cerritos will oppose the blanket requirement for all cities in Los Angeles County to retain and treat 0.75" of stormwater during a twenty-four hour event.

Please contact the City's Director of Public Works, Mr. Vince Brar, at (562) 916-1220 should you have any questions.

Sincerely,

Grace Hu
Mayor

dt

R0069007

CITY OF CLAREMONT

City Hall
207 Harvard Avenue
P.O. Box 880
Claremont, CA 91711-0880
FAX (909) 399-5492

City Council • (909) 399-5444
Sandy Baldonado
Paul Held
Algird Leiga
Karen Rosenthal
Suzan Smith

January 11, 2000

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board--Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

Request for Delay in Issuance of SUSMP

We have reviewed Mr. Rufus Young's letter of January 5, 2000 (copy enclosed) sent on behalf of the cities of Alhambra, Compton, El Segundo, Hawthorne, Industry, Lomita, Santa Clarita, and Torrance regarding the proposed Standard Urban Storm Water Mitigation Plan (SUSMP), and asking that the adoption of the SUSMP be deferred.

We have also reviewed the December 22, 1999 letter from Desi Alvarez, Chairman of the Executive Advisory Committee of the Los Angeles County Permittees (copy enclosed) which requests that a revised SUSMP be distributed to the Permittees for comments.

The City of Claremont shares the concerns expressed, and we also urge you to postpone issuance of the SUSMP until the SUSMP can be recirculated for comment following review and incorporation of the suggested revisions.

Sincerely,

Karen M. Rosenthal
Mayor

Enclosures

c: Nicolas T. Conway, Executive Director, San Gabriel Valley Council of Governments
Rufus C. Young, Jr., Burke, Williams & Sorensen, LLP
Desi Alvarez, Chairman, Executive Advisory Committee
Craig Bradshaw, City Engineer[F]

R0069008

CITY OF CLAREMONT Community Development Department

City Hall
207 Harvard Avenue
P.O. Box 880
Claremont, CA 91711-0880
FAX (909) 399-5492

Building • (909) 399-5471
Planning • (909) 399-5470
Engineering • (909) 399-5465
Community Improvement • (909) 399-5467
Economic Development • (909) 399-5341

September 14, 1999

Via Facsimile, (213) 576-6660
Attention: Xavier Swamikannu

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

NUMERICAL MITIGATION MEASURES

I would like to express opposition to the recommendation by the California Regional Water Quality Control Board, Los Angeles Region, to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs).

The City of Claremont is aware that the Regional Board is under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Given the concerns and associated questions with regards to the incorporation of the numeric mitigation measures, I support the approval of the SUSMPs as originally submitted by Los Angeles County without the numeric measures.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation.

If you have any questions regarding my position, please call me at (909) 399-5474.

Sincerely,

Craig Bradshaw
City Engineer

R0069009

CITY OF CLAREMONT

City Hall
207 Harvard Avenue
P.O. Box 880
Claremont, CA 91711-0880
FAX (909) 399-5492

City Council • (909) 399-5444
Sandy Baldonado
Paul Held
Algird Leiga
Karen Rosenthal
Suzan Smith

September 2, 1999

Via Facsimile (213) 576-6660
Attention: Xavier Swamikannu

Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

Numerical Mitigation Measures - OPPOSE

The City of Claremont opposes the recommendation by the California Regional Water Quality Control Board, Los Angeles Region, to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMP).

The Development Planning Model Program required the County of Los Angeles, as principal permittee under the Los Angeles County Municipal NPDES Permit (NPDES permit), in consultation with the co-permittee cities, to develop the SUSMP for seven types of projects listed in the current NPDES Permit. Los Angeles County, on behalf of permittees, submitted the SUSMP for your approval on July 22, 1999 with revisions made on August 12, 1999. As submitted and revised, the SUSMP did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMP and was intentionally left out for reasons that will be discussed below.

As proposed, the numeric mitigation measures would require cities to impose on developers and/or property owners structural Best Management Practices (BMP) aimed at retaining and/or treating the first 0.75 inches of rainfall within a 24-hour storm event for the following projects: 100+ Home Subdivision; 10-99 Home Subdivision; 100,000+ Square-Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant; or Hillside-Located Single Family Dwelling. Such BMP would be extremely costly, both in terms of construction and ongoing maintenance. This BMP would cover 85% of all storms in this area.

The City of Claremont strongly opposes the proposed language for the following reasons:

- The current Los Angeles County NPDES Permit, as with other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat any volume of stormwater runoff from new developments.

- The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for many years.

- The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers will simply move to neighboring counties to escape the unjustified requirements should they be approved.

- Similar types of requirements have been tried and found to be nearly impossible to implement without more flexibility.

- The costs associated with the proposed numeric mitigation measures constitute an unfunded state mandate. As such, the requirements should have been subject to the same cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities. Lacking such analysis, the City of Claremont thinks that the numeric measures being considered are not based on science or engineering practices.

- The controls necessitated by the numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

- The controls required to meet a numeric retention/treatment limit would (1) require a high degree of maintenance, which cities would be responsible for enforcing; and (2) if not properly maintained, could become sources of pollution rather than pollution mitigants.

The City of Claremont is aware that the Regional Board is under pressure to approve the SUSMP, which were required to be implemented by July 30, 1999. Given the aforementioned concerns and associated questions with regard to the incorporation of the numeric mitigation measures, the City of Claremont supports the approval of the SUSMP as originally submitted by Los Angeles County without the problematic numeric measures.

The City would also suggest that in the future, the Regional Board staff provide cities sufficient time to allow the Council of Governments (COG) to review and comment on NPDES permit issues before they are considered by the Board. Because the COG meets monthly, 30 days notice is not enough time for member cities to take action on such important issues.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation. Perhaps such research could be completed before the issuance of the next municipal permit scheduled in two years.

If you have any questions regarding the City of Claremont's position, please call Craig Bradshaw, City Engineer, at (909) 399-5474.

Sincerely,

Karen M. Rosenthal
Mayor

v:\ah\SUSMPfromcounci

c: City Council
Glenn D. Southard, City Manager
Anthony Witt, Director of Community Development
Craig Bradshaw, City Engineer

City of Commerce

LOS ANGELES REGION

Lela R. Leon
Mayor

Raquel Arriaga
Mayor Pro Tem

Hugo A. Argumedo
Councilmember

Rosalina G. Lopez
Councilmember

Sylvia Muñoz
Councilmember

Raul T. Romero
City Administrator

September 7, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 W. 4th Street Suite 200
Los Angeles, CA 90013

Subject: Opposition to SUSMP Numeric Limits

Dear Mr. Dickerson:

The City of Commerce (hereinafter "City") understands that the regional board will be considering incorporating numeric limits into the Standard Urban Stormwater Mitigation Plan (SUSMP) at its September 16, 1999 meeting. The numeric limits proposed by regional board staff are aimed at retaining and/or treating .75" of storm water during a 24-hour storm event from seven (7) categories of new developments.' The City also understands that the County of Los Angeles the principal permittee under the Los Angeles County Municipal NPDES Permit ("NPDES permit") has already agreed to this standard by way of its settlement agreement with the environmental community.

The City writes to inform you of its opposition to this proposed requirement for the following reasons:

- The NPDES permit contains no language requiring cities to retain/treat any volume of storm water runoff from new developments.

- No other municipal permit in California requires a numeric limit for the retention or treatment of storm water runoff.

- Although other counties in California, such as Alameda and Ventura, require postconstruction controls for new developments, they afford cities broad discretion in determining which types of projects and structural controls to impose on developers.

2535 Commerce Way
Commerce, CA 90040
Phone: 323•722•4805
Fax: 323•888•6841

R0069013

- Although the City of Santa Monica has required numeric limits on retaining/treating storm water runoff through rigid runoff coefficients, its experience with developers has proven that such requirements are difficult to meet.

- If approved, the numeric limits would require cities to impose upon 7 types of new developments costly structural controls (infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof), without regard for whether such controls are needed or whether they would be effective or necessary insofar as protecting a beneficial use of a receiving water.

- The structural controls required to meet a numeric retention/treatment limit would (1) require a high degree of maintenance, which cities would be responsible for enforcing; and (2) if not properly maintained, could become sources of pollution rather than pollution mitigants.

- The numeric limits constitute an unfunded state mandate and have not been evaluated for cost-effectiveness - as required under California law.

- The numeric limits now being considered were not based on science or engineering, but on a negotiated agreement, and are therefore arbitrary.

- The structural controls necessitated by numeric limits would be required without regard to siting actors (soil conditions and other environmental considerations).

- The use of some structural controls such as detention basins/ponds and vegetative buffers are even more undesirable because they reduce the amount of developable area.

- Because cities and developers have little experience in the use of detention/treatment structural controls - coupled with the fact that the SUSMP would require their immediate imposition there is the danger that such controls could be mis-prescribed, as has happened in other parts of the country.

It should also be noted that the NPDES municipal permit Executive Advisory Committee
(EAC) has also taken a position against numeric limits.

The City is aware that the regional board is under pressure to approve the Standard Urban Storm Water Mitigation Plans because the permit requires approval by July 30, 1999. Given the aforementioned problems associated with numeric limits, their absence in the SUSMPs would be in the best interest of this

and other cities. This subject could be reopened for evaluation during discussion of the next municipal NPDES -presumably against a more objective background.

Lastly, in the future regional board staff should provide cities sufficient time to allow the Council of Governments (COGS) to review and comment on NPDES permit issues bearing a significant cost impact. Because the COGs meet monthly, 30 days notice is simply not enough time for member cities to take action on such important issues. As you know, this was an issue raised by the City of Long Beach in its writ of mandate complaint against the regional board.

And as you may also be aware, two years ago the Southern California Association of Governments (SCAG) petitioned the State Water Resources Control Board to involve it and its sub-regional COGs in the discussion of NPDES permit matters. This action was taken because storm water management is an important regional planning issue that demands the involvement of SCAG, a regional planning agency.

Should you have any questions, please feel free to contact me.

Sincerely,

Bob Zarrilli
City Planner

CITY OF COVINA

125 East College Street • Covina, California 91723-2199

August 30, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board - Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: Opposition to SUSMP Numeric Limits

Dear Mr. Dickerson:

The City of Covina understands that the regional board will be considering incorporating numeric limits into the Standard Urban Stormwater Mitigation Plans (SUSMPs) at its September 16, 1999 meeting. The numeric limits proposed by regional board staff are aimed at retaining and/or treating .75" of stormwater during a 24-hour storm event from seven categories of new developments.[1] The City also understands that the County of Los Angeles -- the principal permittee under the Los Angeles County Municipal NPDES Permit ("NPDES permit") -- has already agreed to this standard by way of its settlement agreement with the environmental community.

I am writing to inform you of the City's opposition to this proposed requirement for the following reasons:

- The NPDES permit contains no language requiring cities to retain/treat any volume of stormwater runoff from new developments.
- No other municipal permit in California requires a numeric limit for the retention or treatment of stormwater runoff.
- Although other counties in California, such as Alameda and Ventura, require post-construction controls for new developments, they afford cities broad discretion in determining which types of projects and structural controls to impose on developers.
- Although the City of Santa Monica has required numeric limits on retaining/treating stormwater runoff through rigid runoff coefficients, its experience with developers has proven that such requirements are difficult to meet.[2]

[1]Gas stations; restaurants; automotive repair facilities (including parts shops); 10-99 home sub-divisions; 100-plus home sub-divisions; single home hillside developments; and 100,000 square foot commercial developments.

[2]Many developers in Santa Monica found the runoff coefficient-type numeric limits impossible to meet. The City of Santa Monica has exempted developers from this requirement in exchange for contributing money to the construction of a low-flow dry weather diversion system.

- If approved, the numeric limits would require cities to impose upon seven types of new developments costly structural controls (infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof), without regard for whether such controls are needed or whether they would be effective or necessary insofar as protecting a beneficial use of a receiving water.

- The structural controls required to meet a numeric retention/treatment limit would: (1) require a high degree of maintenance, which cities would be responsible for enforcing; and (2) if not properly maintained, could become sources of pollution rather than pollution mitigants.

- The numeric limits constitute an unfunded state mandate and have not been evaluated for cost-effectiveness -- as required under California law.

- The numeric limits now being considered were not based on science or engineering, but on a negotiated agreement, and are therefore arbitrary.

- The structural controls necessitated by numeric limits would be required without regard to siting factors (soil conditions and other environmental considerations).[3]

- The use of some structural controls such as detention basins/ponds and vegetative buffers are even more undesirable because they reduce the amount of developable area.

- Because cities and developers have little experience in the use of detention/treatment structural controls -- coupled with the fact that the SUSMPs would require their immediate imposition -- there is the danger that such controls could be mis-prescribed, as has happened in other parts of the country.

It should be noted that the NPDES municipal permit Executive Advisory Committee (EAC) has also taken a position against numeric limits.

The City is aware that the regional board is under pressure to approve the Standard Urban Stormwater Mitigation Plans because the permit required approval by July 30, 1999. Given the aforementioned problems associated with numeric limits, their absence in the SUSMPs would be in the best interest of this and other cities. This subject could be reopened for evaluation during discussion of the next municipal NPDES permit -- presumably against a more objective background.

In the future, regional board staff should provide cities sufficient time to allow the Councils of Governments (COGs) to review and comment on NPDES permit issues bearing a significant cost impact. Because the COGs meet monthly, 30 days notice is simply not enough time for member cities to take action on such important issues. As you know, this was an issue raised by the City of Long Beach in its writ of mandate complaint against the regional board.

And as you may also be aware, two years ago the Southern California Association of Governments (SCAG) petitioned the State Water Resources Control Board to involve it and its sub-regional COGs in the discussion of NPDES permit matters. This action was taken because stormwater management is an important regional planning issue that demands the involvement of SCAG, a regional planning agency.[4]

---

[3]For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Further, if a detention basin, pond, or similar device were sited in an area where underlying soil contains a high degree of clay, the detained stormwater could pond, thereby attracting vectors such as mosquitoes. This could pose a serious health problem, especially if the device is sited in a mosquito abatement district.

[4]The Clean Water Act requires involvement of regional planning agencies such as SCAG in the development of municipal NPDES permits.

Should you have any questions, please contact Charles Redden at (626) 858-7204.

Sincerely,

Francis M. Delach
City Manager

FMD:crr

cc: Mr. Scott Pomrehn, Chairman, San Gabriel River Watershed Committee
File

City of Diamond Bar

21660 E. Copley Drive, Suite 100 · Diamond Bar, CA 91765-4177

(909) 860-2489 · Fax (909) 861-3117

www.CityofDiamondBar.com

RECEIVED
JAN 13 2000
BY:.....

January 11, 2000

Dennis Dickerson, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Re: Opposition to Proposed Adoption of Numerical Mitigation Measures for the Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

Pursuant to your correspondence of December 7, 1999, the City of Diamond Bar (City) would like to express its ***opposition*** to the proposed adoption of numerical design standards as the minimum standards for post-construction BMPs to be required under the Standard Urban Storm Water Mitigation Plan (SUSMP). Rather than simply reiterate our previously stated positions, we have identified other concerns with the process of how the numeric standards have been considered and proposed, and how SUSMP comments from the public were addressed in the accompanying "Summary of Comments Received and Response."

First, we do approve of specific changes made to the SUSMP, which indicate that the Regional Board has been in part responsive to concerns of the permittee cities. Among the positive changes since the initial draft, include 1) eliminating numeric standards as an across the board requirement for subject new developments which would seem to indicate, for instance, that treating and retaining runoff from rooftops has been eliminated, 2) additional format changes such as condensing SUSMPs into one section, rather than redundant sections addressing each development type separately, and 3) provision of a waiver process (albeit even one that may unfairly penalize some projects) that recognizes the need for an "out clause" in the event that installing controls are infeasible.

Nonetheless, the changes do not, in any way, lessen our objections to the imposition of the numeric standards, especially proposed so late in the existing permit without adequate scientific study, economic analysis, and public comment. We understand the desire of the Regional Board to respond to intense lobbyist

Deborah H. O'Connor
Mayor

Eileen R. Ansari
Mayor Pro Tem

Wen Chang
Council Member

Carol Herrera
Council Member

Robert S. Huff
Council Member

Recycled paper

pressure and negative media publicity regarding beach pollution. However, to institute a stringent policy and requirements without adequate local scientific study is not justified.

This represents the second part of our objection to the proposed inclusion of numeric standards into the SUSMPs. A cursory review of the "Summary of Comments Received and Response" shows that virtually all comments provided by the cities were summarily rejected without adequate reason, while opposition arguments were often incorporated. One instance of this is the enlargement of the scope of SUSMPs from the existing seven development types to include two new categories, parking lots and environmentally sensitive areas. Both of these types were raised as developments for regulation by the environmental lobby; and while the Board indicated at the time, according to the record, that it wouldn't enlarge the scope at this time, it apparently had decided to do so. This would clearly seem to warrant the re-opening of the permit. We wonder if the Board has purposely done so with the intent of forcing re-permitting issues well in advance of the readiness of the permittees to address.

Another concern of the process is the timing of this document and the resolution. In September, the Regional Board indicated that the January meeting would be a workshop. By proposing adoption of the resolution and the incorporated numeric standards, the Board seems to be reneging on its promise to properly consider the cities' concerns. We understand that the date for adoption has been pushed back to January 26, 2000. However, we still have some concerns that by proposing adoption in January, the Board is effectively precluding any reasoned response by the regulated communities. Most, if not all permittees' offices are closed during the holidays, making it extremely difficult to meet, to plan, and to organize for the meeting. We simply do not understand why the Board wants to pressure the regulated community with a short deadline and a forced decision on such an important issue?

The City is extremely upset about the process as well as the attempt to revise the existing permit without following specified procedures that have been approved by the Board. Section G.1, Administrative Review. appears to stipulate the need for the Board to issue a Notice to Meet and Confer (NTMC) in the event that a storm water program is insufficient to meet permit requirements. Imposition of numeric standards this late in the permit would argue, as the environmental lobby has so succinctly put it that the existing permit is inadequate and needs to be upgraded. Since no NIMC has been issued, we believe that inadequate grounds exist for the Board to impose both numeric standards and additional development types.

Finally, we request that the Board formally consider our comments, and that the Executive Director consider making a request at the January 26th meeting to postpone any vote on the SUSMP until an adequate local study is performed concerning economic and technical

feasibility. Should you have any questions regarding Diamond Bar's position, please contact Mr. David G. Liu, Deputy Director of Public Works, 909/396-5671, or Mr. J. Michael Huls, Integrated Environmental Services Coordinator, 626/969-7816.

Sincerely,

Deborah H O'Connor

Deborah H. O'Connor
Mayor

DHO:nbw

c: Regional Water Quality Control Board Members
Diamond Bar City Council
Terrence L. Belanger, City Manager
David G. Liu, Deputy Director of Public Works
J. Michael Huls, Integrated Environmental Services Coordinator

City of Diamond Bar

21660 E. Copley Drive, Suite 100 · Diamond Bar, CA 91765-4177

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RECEIVED
SEP 14 1999
BY:.....

September 13, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: OPPOSITION TO NUMERICAL MITIGATION MEASURES

Dear Mr. Dickerson:

The City of Diamond Bar would like to express our strong opposition to the recommendation by Los Angeles Regional Water Quality Control Board (Regional Board) staff to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs). As you know, the Development Planning Model Program required the County, in consultation with Cities, to develop the SUSMPs for seven types of projects listed in the current NPDES Permit. After months of development and countless meetings, Los Angeles County, on behalf of Permittees, submitted the SUSMPs for your approval on July 22, 1999 with revisions made on August 12, 1999. As submitted and revised, the SUSMPs did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMPs and was intentionally left out for numerous reasons that will be discussed below.

As proposed, the numeric mitigation measures would require cities to impose on developers and/or property owners structural Best Management Practices (BMPs) aimed at retaining and/or treating the first .75 inches of rainfall within a 24-hour storm event for the following projects: 100^{+} Home Subdivision; 10-99 Home Subdivision; $100{,}000^{+}$ Square-Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant; or Hillside-Located Single-Family Dwelling. Such BMPs would be extremely costly, both in terms of construction and on-going maintenance.

Diamond Bar strongly opposes the proposed language for the following reasons:

Wen Chang
Mayor

Deborah H. O'Connor
Mayor Pro Tem

Eileen R. Ansari
Council Member

Carol Herrera
Council Member

Robert S. Huff
Council Member

Recycled paper

- The current Los Angeles County NPDES Permit, like all other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat stormwater runoff from new developments. Diamond Bar feels Board staff has decided to propose such language as a result of pressure from the environmental community and not sound science or engineering practices. Diamond Bar strongly urges the Regional Board to ask staff what data was used in determining the need for such standards and the level at which the standards were set. In light of the lack of region specific studies, detailed cost-benefit analysis and a decisive link between such mitigation measures and improvement of our receiving waters, the Board should reject the proposed recommendation.

- While other NPDES permits, such as Alameda and Ventura Counties, require post st-construction controls for new developments, both permits afford city discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.post-construction controls for new developments, both permits afford city discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for many years. Having recently suffered through the downsizing of the defense industry, State take-aways and the worst recession in modern times, Diamond Bar can ill afford to implement any requirements that could jeopardize our recent achievements in the economic development arena. Without thorough studies on the effects of such requirements on economic development in the region, such action by the Board will be strongly opposed by local government and the interests they represent.

- As it stands, incorporation of the proposed language will tie the hands of cities and impose standards in Los Angeles County that are not found anywhere else in the State. Economic development will not only suffer on a local basis, but as a region Los Angeles County stands to lose both jobs and revenue to neighboring counties where similar requirements are nonexistent.

  The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers will simply move to Orange, Riverside or Ventura counties to escape the unjustified requirements should they be approved.

- Similar types of requirements have been tried and found to be nearly impossible to implement without some flexibility. The City of Santa Monica requires the retaining and/or treatment of stormwater runoff based on similar numeric mitigation measures to the ones proposed by Board staff. The City of Santa Monica used a runoff coefficient formula to determine what structural controls must be constructed on all development projects. Based on the difficulty developers had in siting the necessary facilities and meeting the goals of the program, the city modified the program to allow developers to make monetary contribution towards the construction of a low-flow dry weather treatment facility.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded state mandate. As such, the requirements should have been subject to the same cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities. Lacking such analysis, Diamond Bar feels the numeric measures being considered were not based on science or engineering practices, but are arbitrary and a direct result of the influence of the environmental community on Board staff.

- The structural controls necessitated by numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

Diamond Bar is aware that the Regional Board is under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Given the aforementioned concerns and associated questions with regards to the incorporation of the numeric mitigation measures, Diamond Bar supports the approval of the SUSMPs as originally submitted by the Los Angeles County without the problematic numeric measures.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation. Hopefully such research could be completed before the issuance of the next municipal permit scheduled in two years.

Diamond Bar would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government. Hopefully, you will agree with us that without supportive evidence that such requirements will achieve measurable goals and the cost benefit analysis justifies such mandates, the issue should be tabled.

Should you have any questions regarding Diamond Bar's position, please contact David G. Liu, P.E., Deputy Director of Public Works, at 909/396-5671, or J. Michael Huls, REA, Integrated Environmental Services Coordinator, at 626/969-7816.

Respectfully,

Mayor

Cc: Terrence L. Belanger, City Manager
J. Michael Huls, REA, Integrated Environmental Services Coordinator

City of Downey

FUTURE UNLIMITED

September 2, 1999

Dr. Xavier Swamikannu
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: Numerical Mitigation Measures for BMP Design Criteria

Dear Dr. Swamikannu:

The City of Downey is strongly opposed to the numerical mitigation measures proposed by the Regional Water Quality Control Board staff. We are surprised to find that the Regional Board has unilaterally chosen to insist on inserting numerical standards in the SUSMPs. The SUSMPs were developed through the lengthy efforts between the permittees and the Regional Board where it was decided there is insufficient documentation to support the use of numerical standards.

At this point, we would like to iterate the reasons why the inclusion of numerical standards in the SSUMPs is unwarranted:

1. There is insufficient information regarding levels of relevant pollutants in receiving waters to justify the Treatment Control BMPs dictated by the numerical standards. There are no studies that indicate which pollutants of concern are above acceptable levels in the receiving waters.

2. There is insufficient stormwater monitoring data available to demonstrate that the types of activities regulated by the numerical standards are actually causing a negative impact to the receiving water. We may incorrectly be placing BMPs in locations where they will have no impact on storm runoff or on the reduction of target pollutants.

3. An in-depth analysis has not been performed regarding the effectiveness of the approved BMPs that provide criteria for the selection of BMPs to achieve the numerical standards being recommended. If we are required to treat a certain amount of water flowing from the site, we need to choose BMPs which effectively treat the flow rate due to the design storm. There needs to be criteria for calculating contact time, settling rates, and other deisgn parameters that are not known at this time.

R0069026

4. A set numerical standard that may be applicable for certain developments in one area may not be appropriate in another area. The amount of rainfall varies dramatically within the L.A. basin, and the 85% storm will vary dramatically. This is well known and documented in the design guidelines for hydrology studies within Los Angeles County.

5. Research has not been performed to determine the possibility of contamination of groundwater and soil from the percolation of runoff from impervious areas. The contaminants do not simply "go away" when percolated into the ground. Some contaminants will be consumed by bacteria in the ground, but others such as heavy metals will remain in the soil or may leach into the groundwater.

6. Storm water treatment and retention numeric standards are not specifically mandated in the municipal NPDES permit, or with any other municipal NPDES permits issued in the State of California.

7. Numerical standards have been applied in Santa Monica, and the implementation has proven to be difficult or impossible on many sites. Santa Monica is often looked upon as the test case for new ordinances and stormwater quality techniques. The implementation of numerical standards similar to those being proposed in the SUSMPs have proven to be difficult and expensive to implement.

8. Imposing such unproven and questionable numeric standards on cities constitutes an un-funded state mandate, one that has not been evaluated in cost-effective terms, as required by state law.

9. Imposing numerical standards will be extremely costly, and will reduce the funds that developers will be able to spend on other improvements desired by the cities. There is only a certain amount of money available to remedy deficiencies related to a property. Every dollar taken to comply with numerical standards reduces the amount of dollars available for other required improvements such as traffic mitigation or utility upgrades.

10. Numerical standards contradict drainage laws if they prohibit or reduce the legal discharge from a site. Local cities will find themselves in a situation in which they will be unable to act in a lawful manner as the laws will be contradictory.

11. These types of numerical standards are not found anywhere else in the state of California. Economic development will not only suffer on a local basis, but as a region Los Angeles County stands to lose both jobs and revenue to neighboring counties where numerical standards are non-existent.

We strongly recommend that numerical standards not be included in the SUSMPs at this time. The numerical standards are premature, ineffective, and place an unnecessary burden on our community.

Downey would like to thank the Regional Board and staff for their support and understanding of the concerns raised during NPDES implementation. Hopefully, you will agree with us, and the numerical standards will be removed from the SUSMPs.

Should you have any questions, please do not hesitate to call me at (562) 904-7110.

Sincerely,

Allan Rigg, P.E.
Principal Engineer

H:\pubworks\shared\npdes\1999\susmp\comment2.doc

CITY OF EL MONTE
PUBLIC WORKS ENGINEERING DEPARTMENT
11333 VALLEY BOULEVARD • EL MONTE, CA 91731-3293
(626) 580-2056 • FAX: (626) 580-2293
www.elmonte.org

January 12, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board, Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

SUBJECT: STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP)

Dear Mr. Dickerson:

The City of El Monte has been implementing it's SUSMP program for some time now and appreciates the challenges that the Regional Board has encountered during their development of a single, comprehensive program for all of the cities of the Los Angeles Region. The City is currently and has been for some time, requiring treatment controls for major projects prior to permit issuance. The City is continuously updating and reviewing its policies to ensure the community's quality of life as well as the protection of its natural resources. The City supports the Board in its effort to develop a practical, efficient and feasible process. We believe the overall goal of SUSMP requirements for new development and redevelopment must be to effectively reduce pollution in stormwater and urban runoff.

While El Monte supports the Board and its staff in establishing realistic baseline SUSMP standards, it is important that the Board also allow the use of alternative mitigation methods so long at the goal remains the achievement of cleaner stormwater runoff. This approach would effectively meet the goals of the SUSMP program in an effective and reasonable manner. The City's SUSMP program continues to be a very

dynamic and progressive procedure that will only improve with time and experience.

The City of El Monte believes that it is a partner with the Regional Board in the protection of the Region's environment and looks forward to the development of SUSMP standards which meet the mutual goals of our two agencies. Should you have any questions related to this matter, or if you desire any information related to the City's stormwater/urban runoff program, please feel free to contact me at (626) 580-2056.

Sincerely,

Kev Tcharkhoutian, P.E.
City Engineer

Fm. 213-576-6654

Gateway Cities

COUNCIL OF GOVERNMENTS
SOUTHEAST LOS ANGELES COUNTY

TO: Dr. Xavier Swamikanna

ORGANIZATION: Regional Water Quality Control Board

FAX NUMBER 213-576-6660

FROM: Richard Powers

SUBJECT:

Total Pages Including Cover: 3

MESSAGE:

7300 Alondra Boulevard, Suite 103 ~ Paramount, California 90723 ~ Tel: (562) 663-6850 ~ Fax: (562) 634-8216

R0069031

RESOLUTION NO. 99-7

A RESOLUTION OF THE GATEWAY CITIES COUNCIL OF GOVERNMENTS URGING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, NOT TO IMPOSE NUMERIC LIMITS WITHIN THE STANDARD URBAN STORMWATER RUNOFF MITIGATION PLANS.

WHEREAS, the Gateway Cities Council of governments is a sub-region of the Southern California Association of Governments consisting of 27 member cities;

WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region (hereinafter "the Board") is considering the incorporation of numeric limits into the Standard Urban Storm Water Runoff Mitigation Plan component of the Model Development Planning Program - a requirement associated within the Los Angeles County Municipal NPDES permit;

WHEREAS, such numeric limits are intended to retain or treat the 85th percentile of storm water runoff (first 3/4 inch) from seven categories of new development projects, including 10-99 home subdivisions, 100+ home subdivisions, single family homes on hillsides, gas stations, auto service facilities, restaurants and 100,000+ square-foot commercial developments;

WHEREAS, meeting the proposed numeric limits would necessitate the imposition of structural controls such as infiltration basins, vegetative swales, permeable pavement or catch basin inserts on new development projects;

WHEREAS, there is insufficient information regarding the levels in receiving waters to justify the additional expense of installing and maintaining the structural controls and no cost analysis having been performed by the Board;

WHEREAS, capturing the 85th percentile has not been shown to have a corresponding positive impact on the quality of storm water runoff and potential negative impact to soil or groundwater from infiltration have not been adequately addressed;

WHEREAS, strict numerical limits may be applicable for certain developments in some areas but not applicable in others;

WHEREAS, numerical limits are not included in the Standard Urban Storm Water Runoff Mitigation Plans as developed for the Planning Model Program by the Co-permittees and is not required under the Municipal permit.

NOW, THEREFORE THE EXECUTIVE COMMITTEE OF THE BOARD OF DIRECTORS OF THE GATEWAY CITIES COUNCIL OF GOVERNEMNTS DOES HEREBY RESOLVE:

SECTION 1. Advise the Board Members of its opposition to numeric storm water treatment and retention limits; and

SECTION 2. Recommend the Board approve the Standard Urban Storm Water Mitigation Plans that do not include numeric limits.

R0069032

PASSED, APPROVED, AND ADOPTED THIS 8th DAY OF SEPTEMBER 1999.

ATTEST:

SECRETARY
STATE OF CALIFORNIA)
COUNTY OF LOS ANGELES) ss

I, Richard Powers, Executive Director of the Gateway Cities Council of Governments, hereby certify that the foregoing Resolution was duly adopted by the Executive Committee of the Board of Directors of the Gateway Cities Council of Governments at a regular meeting thereof, held on September 8, 1999, by the following vote:

AYES: ALL MEMBERS PRESENT

Allan Zolnekoff, Gene Daniels, Wayne Piercy, Marcine Shaw, Edward Wilson, Frank Colonna, Keith McCarthy Bruce Barrows, Hector De La Torre, Beatrice Proo

Executive Director

R0069033

CITY OF GLENDORA CITY HALL (626) 914-8200
116 East Foothill Blvd., Glendora, California 91741
www.ci.glendora.ca.us

September 17, 1999

Dr. Xavier Swamikannu
California Regional Water Quality Control Board – Los Angeles Region
320 West Fourth Street, Suite 200
Los Angeles, Ca. 90013-1105

Re: Standard Urban Stormwater Mitigation Plans.

Dear Dr. Xavier Swamikannu,

I attended the Regional Board's meeting on Thursday, September 16, 1999, and observed with great interest the testimony that was presented by the many Cities and other public and private agencies. As always, the environmental community presented an impassioned and zealous plea for progress to be made in reducing pollutant loading from new and redeveloping properties. I was saddened somewhat by the comments by David Beckman that suggested public and private agencies who expressed opposition to the proposed SUSMP revisions were "foot draggers" or "incompetent". I understand Mr. Beckman's frustration, however, and of course we all share their goals. I was particularly moved by your compelling arguments supporting the revisions, and your responses to the questions from the Board. I have always had great respect for your opinions and perspectives on the issues that have confronted us all since the inception of the NPDES program here in Los Angeles. As I left the Board room and made my way back to Glendora I pondered the comments we had heard and in particular, your closing view points. However, something in the SUSMP revisions continue to make me uncomfortable.

I believe that it is my experiences and observations here in Glendora that are causing my discomfort regarding the proposed structural control BMPs. Since 1995 Glendora has tried to achieve the goals of the NPDES permit by requiring some developments to submit an "Urban Runoff Pollution Mitigation Plan" as a condition of project approval. The purpose of this plan is for the developer to incorporate "design elements and principles that will increase permeable areas, minimize runoff directed to impermeable areas, maximize storm water detention, and reduce parking lot pollution". Glendora included a design goal of producing a 10% reduction in post-construction storm water runoff, (to generate 10% less post-construction runoff than would have been generated without the structural mitigation measures). Since 1995 I have reviewed dozens of commercial, industrial, and residential Glendora developments that have met the dictates of this ordinance, and the vast majority of these projects have chosen to use underground infiltrator type systems to meet the 10% reduction in runoff. These systems are well designed and have thus far performed their function without apparent problem. However, only time will tell if these systems will prove to be a benefit or a

detriment in our effort to protect the environment. Allow me to explain why I am concerned.

Since 1980 I have reviewed the engineered drawings for well over 400 subdivisions, commercial and industrial plazas, and hundreds of small commercial developments in Glendora. Many, if not all, of these projects have included some form of private onsite storm drain system. Many were substantial in size, and most of those constructed within the last five years include some form of infiltrator chamber to capture the mandated 10% of a 25 year rainfall event. I have had the rare opportunity to observe first hand how well these systems are being maintained over time. I have examined systems that are five, ten, fifteen and twenty years old, and many are totally inoperative due to a lack of maintenance. This is particularly true with small businesses where the merchant is a tenant with no involvement in facility maintenance, and the owner is absent, relying on contracted services for land management items. The opportunity for accidental or unintentional pollutant discharges are very great with these types of businesses, and if an infiltrator system is included in the private on-site storm drain, a high likelihood exists that the pollutant will end up in the underground chamber and remain there undetected indefinitely.

Anyone who thinks that Cities can regulate and monitor the perpetual maintenance of these private onsite systems is simply out of touch with reality. Even if cities were to miraculously find a funding resource that would enable them to hire adequate staff and administrative support for such a grand Orwellian venture, the opportunity for an undetected spill to contaminate an underground infiltrator system remains an unacceptable risk.

From a Civil Engineering perspective, the simple solution is often the best. Our heavily urbanized watershed contains hundreds of thousands of small businesses that require a non-point solution allowing the highest level of detection with the least amount of intrusion into private property. Human nature being as it is, we can expect most citizens to comply with "soft cost" BMPs that involve common sense behavior modifications, while a few citizens will pollute regardless of our efforts whenever the behavior in question is cheaper or easier than doing the responsible thing. Having individual onsite "capture" systems by the thousands throughout the watershed will only increase the chances of pollutants being discharged directly into the ground without detection.

Although I personally assisted in the development of Glendora's current Urban Runoff Mitigation ordinance, I am now questioning the logic of the capture and infiltrate method for good long term non-point source pollutant control. I now believe that our historic practice of delivering urban storm water runoff efficiently into the nearest publicly maintained storm drain system might in fact be the best protection for our environment. Our original vision included a network of monitoring stations throughout the storm drain network to detect pollutant discharges. These discharges could then be traced back to their source, or at least the tributary area of their origin, and then an investigation by the local regulating agency can take place to remedy the problem. Private onsite infiltration should be carefully restricted to include only tributary areas where no possible contact with pollutants can occur. I would suggest only considering runoff from landscape areas for infiltration. I would also suggest not directing runoff from paved areas into landscape areas.

I believe that ground water recharge should be carefully limited to public facilities where water quality can be monitored prior to diversion into a recharge basin. First flush runoff may not be suitable for this use, and if not, then centralized public treatment facilities will be our only long-term recourse to protect receiving waters. The quality of the water entering our storm drain system will always depend on the level of understanding and commitment demonstrated by the public at large. Public concern cannot be legislated or mandated. It cannot come from without, it must come from within. If the success of our efforts depends upon the responsible maintenance of thousands of private runoff filtration systems and the ability of local cities to monitor and regulate that maintenance, I fear we are creating a future problem of tragic proportion.

Therefore, I respectfully submit that I must disagree with the concept of onsite capture and most forms of onsite infiltration. I am convinced based on personal observation and the rare insight I have gained from twenty years of local municipal engineering, plan checking and private construction inspection, that this policy direction will not significantly improve water quality over the long term. I am fearful that this approach will divert problems into an area of our environment that will be even more difficult to control and correct.

If you have any questions, or if I can be of any assistance please contact me at (626) 914-8246.

Sincerely,

Brad Miller
Civil Engineering Associate

cc: Gary Napper, City Manager
Richard Cantwell, City Engineer/ Public Works Director

City of
HUNTINGTON PARK california

6550 MILES AVENUE, HUNTINGTON PARK, CALIFORNIA 90255

Tel. (213) 582-6161 • Fax (213) 588-4577

ENGINEERING DEPARTMENT

September 1, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: OPPOSITION TO NUMERICAL MITIGATION MEASURES

Dear Mr. Dickerson:

The City of Huntington Park would like to express our strong opposition to the recommendation by Regional Board staff to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs). As you know, the Development Planning Model Program required the County, in consultation with Cities, to develop the SUSMPs for seven types of projects listed in the current NPDES Permit. After months of development and countless meetings, Los Angeles County, on behalf of Permittees, submitted the SUSMPs for your approval on July 22,1999 with revisions made on August 12, 1999. As submitted and revised, the SUSMPs did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMPs and was intentionally left out for numerous reasons that will be discussed below.

As proposed, the numeric mitigation measures would require cities to impose on developers and/or property owners structural Best Management Practices (BMPs) aimed at retaining and/or treating the first .75 inches of rainfall within a 24-hour storm event for the following projects: 100^{+} Home Subdivision; 10-99 Home Subdivision; $100{,}000^{+}$ Square-Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant; or Hillside-Located Single-Family Dwelling. Such BMPs would be extremely costly, both in terms of construction and on-going maintenance.

Maywood strongly opposes the proposed language for the following reasons:

- The current Los Angeles County NPDES Permit, like all other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat stormwater runoff from new developments. Huntington Park feels Board staff has decided to propose such language as a result of pressure from the environmental community and not sound science or

engineering practices. Huntington Park strongly urges the Regional Board to ask staff what data was used in determining the need for such standards and the level at which the standards were set. In light of the lack of region specific studies, detailed cost-benefit analysis and a decisive link between such mitigation measures and improvement of our receiving waters, the Board should reject the proposed recommendation.

- While other NPDES permits, such as Alameda and Ventura Counties, require post-construction controls for new developments, both permits afford city discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for many years. Having recently suffered through the downsizing of the defense industry, State take-aways and the worst recession in modern times, Huntington Park can ill afford to implement any requirements that could jeopardize our recent achievements in the economic development arena. Without thorough studies on the effects of such requirements on economic development in the region, such action by the Board will be strongly opposed by local government and the interests they represent.

- As it stands, incorporation of the proposed language will tie the hands of cities and impose standards in Los Angeles County that are not found anywhere else in the State. Economic development will not only suffer on a local basis, but as a region Los Angeles County stands to lose both jobs and revenue to neighboring counties where similar requirements are nonexistent.

  The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers will simply move to Orange, Riverside or Ventura counties to escape the unjustified requirements should they be approved.

- Similar types of requirements have been tried and found to be nearly impossible to implement without some flexibility. The City of Santa Monica requires the retaining and/or treatment of stormwater runoff based on similar numeric mitigation measures to the ones proposed by Board staff. The City of Santa Monica used a runoff coefficient formula to determine what structural controls must be constructed on all development projects. Based on the difficulty developers had in siting the necessary facilities and meeting the goals of the program, the city modified the program to allow developers to make monetary contribution towards the construction of a low-flow dry weather treatment facility.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded state mandate. As such, the requirements should have been subject to the same cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities. Lacking such analysis, Huntington Park feels the numeric measures being considered were not based on science or engineering practices, but are arbitrary and a direct result of the influence of the environmental community on Board staff.

- The structural controls necessitated by numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

Huntington Park is aware that the Regional Board is under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Given the aforementioned concerns and associated questions with regards to the incorporation of the numeric mitigation measures, Huntington Park supports the approval of the SUSMPs as originally submitted by the Los Angeles County without the problematic numeric measures.

As a follow-up to this letter and to more formally express Huntington Park's opposition to the proposed numeric measures, the Huntington Park City Council will be requested to adopt a Resolution opposing such measures at its September 20th meeting. The Resolution will be presented to the Regional Board to be formally entered into the public record.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation. Hopefully such research could be completed before the issuance of the next municipal permit scheduled in two years.

Huntington Park would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government. Hopefully, you will agree with us that without supportive evidence that such requirements will achieve measurable goals and the cost benefit analysis justifies such mandates, the issue should be tabled.

Should you have any questions regarding Huntington Park's position, please contact Wes Lind, City Engineer/Building Official at 626-585-0767, or Patrick Fu, Assistant City Engineer at 323-584-6253.

Respectfully,

Wes Lind
City Engineer/Building Official

CITY OF INDUSTRY

Incorporated June 18, 1957

September 9, 1999

Dr. Xavier Swamikannu
California Regional Water
Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, California 90013

Subject: **Standard Urban Storm Water Mitigation Plan**

Dear Dr. Swamikannu:

The City of Industry City Council recently adopted Resolution No. 1810 urging the California Regional Water Quality Control Board not to impose numerical limits on the treatment or retention of storm water runoff from new developments. Please add this document to the agenda for the Boards consideration at the September 16, 1999 public hearing.

If you have any questions or require additional information, please advise.

Sincerely,

John D. Ballas
City Engineer

JDB:jk:jl

R0069040

P.O. Box 3366, City of Industry, California 91744-0366 • Administrative Offices: 15651 E. Stafford St. • (626) 333-2211 • Fax (626) 961-6795

RESOLUTION NO. 1810

A RESOLUTION OF THE CITY OF INDUSTRY URGING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, NOT TO IMPOSE NUMERIC LIMITS ON THE TREATMENT OR RETENTION OF STORM WATER RUNOFF FROM NEW DEVELOPMENT PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL STORM WATER NPDES PERMIT (ORDER NO. 96-054, NPDES NO. CAS614001)

Whereas, the City of Industry (the "City") is a co-Permittee to the "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles" National Pollutant Discharge Elimination System (NPDES) permit; hereinafter, " Municipal Storm Water Permit."

Whereas, the City is informed that the California Regional Water Quality Control Board, Los Angeles Region (hereinafter "Regional Board") is considering the incorporation of numeric limits into the Standard Urban Storm Water Runoff Mitigation Plan component of the model development planning program – a requirement to be incorporated into the Municipal Storm Water Permit.

Whereas, such numeric limits would be applied to seven categories of new development projects, including individual retail gasoline outlets, individual restaurants, individual auto repair facilities, subdivisions of 10-99 homes, subdivisions of 100 or more homes, single-family hillside homes, and 100,000 square foot commercial developments (based on total impermeable area, including parking area, and not building footprint);

Whereas, imposition of numeric limits as post-construction controls is ***not*** required by the US EPA's requirements for municipal NPDES permits

Whereas, compliance with the proposed numeric limits would necessitate the City to require structural controls on new developments, including but not limited to construction and maintenance of wetlands and ponds (which would render the property owner subject to the Clean Water Act, the Endangered Species Act and the Migratory Bird Treaty Act with respect to maintenance of the wetland), extended detention basins, infiltration basins/ponds (which reduce the amount of developable space), storm drain-connected oil/grit separators, catch basin inserts, grassy swales, and other devices, many of which have not been proven to be efficient of cost-effective;

Whereas, imposition of post-construction controls including construction and maintenance of wetlands, detention ponds, infiltration basins and trenches, catch basin

inserts, swales, and the like is ***not*** required by the US EPA's requirements for municipal NPDES permits

Whereas, such structural controls would require post-construction operation and maintenance, at the owners' expense, and would require the City to develop an inspection and enforcement program, at further expense to the City;

Whereas, such controls, if not properly designed or maintained, could become sources of pollution rather than a pollution mitigation measure;

Whereas, storm water treatment and retention numeric limits are ***not*** required by the US EPA's requirements for municipal NPDES permits and to the City's understanding are not a requirement of any other municipal NPDES permits issued in the State of California.

Whereas, the Regional Board has not informed the City that there is any evidence in the administrative record which provides compelling justification for the use of numeric limits for treating or retaining storm water runoff from new developments in the post-construction, operational stage;

Whereas, the Regional Board has not demonstrated that there is any evidence in the administrative record that storm water retention/treatment numeric limits would result in the improvement or protection of a beneficial use of the receiving waters within the Los Angeles Regional Board's Jurisdiction;

Whereas, imposing such unproven and questionable numeric limits on the City of Industry constitutes an unfunded state mandate, has not been evaluated in cost-effective terms as required by state law; is arbitrary and capricious, and exceeds the requirements of the US EPA regulations and the federal Clean Water Act,

NOW, THEREFORE, the City of Industry does hereby resolve as follows:

Section 1. The City Staff is directed to advise the Regional Board members of the City's opposition to the Board's adoption of storm water treatment/retention numeric limits as proposed; and

Section 2. The City recommends to the Board that the Regional Board approve the Standard Urban Storm Water Mitigation Plan, which does not include numeric limits, as proposed by the Executive Advisory Committee on August 11, 1999.

PASSED, APPROVED, AND ADOPTED this 9th day of September, 1999.

Dave Winn, Mayor

ATTEST:

Jodi Scrivens, City Clerk

R0069043

STATE OF CALIFORNIA	)	CITY CLERK'S CERTIFICATE
COUNTY OF LOS ANGELES	) ss.	RE: ADOPTION OF CITY RESOLUTION
CITY OF INDUSTRY	)	

I, Jodi L. Scrivens, City Clerk of the City of Industry, California, do HEREBY CERTIFY that the foregoing Resolution was duly adopted by the City Council of the City of Industry at a regular meeting of said City Council held on the 9th day of September, 1999, and that the same was passed and adopted by the following vote, to wit:

AYES:	COUNCIL MEMBERS:	Tom Durant, John P. Ferrero, Jack Phillips, Dean Winn, Mayor Dave Winn
NOES:	COUNCIL MEMBERS:	None
ABSENT:	COUNCIL MEMBERS:	None
ABSTAIN:	COUNCIL MEMBERS:	None

Jodi L. Scrivens, Deputy City Clerk

I hereby certify that the above and foregoing document is a true and correct copy of the original record on file in this office.

Date: Oct. 9, 1999

City Clerk

R0069044

CITY OF INDUSTRY

Incorporated June 18, 1957

September 2, 1999

Dr. Xavier Swamikannu
California Regional Water
Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Subject: **Consideration of Approval of the Standard Urban Storm Water Mitigation Plans (SUSMP) - Los Angeles County Municipal Storm Water Permit**

Dear Dr. Swamikannu:

This letter is in response to the Regional Board's staff recommendation to impose numerical mitigation measures to the County and Co-permittee's submittal of the SUSMP. The BMP design criteria is based on the "mitigation" of small storms to capture 0.75 inches of runoff events, runoff volumes and pollutant loads.

The City of Industry disagrees with this numerical limits for many reasons. Such reasons include but are not limited to, a lack of definition of the "pollutants of concern"; the financial burden placed upon development projects and the property owners; the required cost of structural BMPs such as infiltration basin/areas and detention ponds; the potential ground water contamination and the attractive nuisances of those BMPs.

At this time, there are a lack of studies that quantify and qualify the "pollutants of concerns" and their long term degradation to the beneficial uses of a water body. It is also unclear as to the level of pollutants which would constitute the need to capture, contain and treat large volumes of storm water runoff.

A frequent development project consisting of twenty-five acres of impervious area would require a permanent structural BMP that would capture approximately 467,500 gallons of storm water runoff. This volume of runoff would require a structure approximately 6 feet in depth, 80 feet in width and 1,060 feet in length. This is an impractical way to construct a development project due to the lack of space needed for the structural BMP. Any mandatory permanent structural BMPs would be considered an inefficient method to mitigate storm water quality. The cost associated with this BMP would impose an economic hardship on the owner and would exceed the economically feasible.

R0069045

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Additionally, capturing the runoff will require postponing the discharge to the local storm drains after some level of treatment. It is unclear as to who will be qualified to perform storm water treatment controls and monitoring prior to discharge.

In the case of an infiltration pit and in areas where the ground water table is high, any storm water runoff will not be fully clarified by the effects of percolation. This will result in contamination of the ground water supply and a violation of the Safe Drinking Water and Toxic Enforcement Act of 1986.

In the case of a detention pond, standing water poses a health hazard due to algae and bacteriological growth. These ponds can be unsafe and attract the nuisances such as playful children in mosquito infested waters. Security fences will be required and deemed unsightly.

The City of Industry believes the BMP's of parking lot sweeping, catch basin stenciling, landscape maintenance, litter control, and storm water education outreach are more practical and effective methods to control pollutant loads than capturing quantities of storm water runoff and constructing costly permanent structural BMP's.

The City of Industry requests that the Regional Board approve the Standard Urban Storm Water Mitigation Plans as submitted by the County, on behalf of the copermittees.

Please include these comments in your agenda folder before the public hearing of September 16, 1999. Should you require further discussion, please call me.

Sincerely,

John D. Ballas
City Engineer

JDB:JK:jl

c: John Kao, CNC Engineering

Municipal SW

CITY OF IRWINDALE

5050 North Irwindale Avenue • Irwindale, California 91706
(818) 962-3381 • Facsimile: (818) 962-4209

September 7, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 W. 4th Street Suite 200
Los Angeles, CA 90013

Subject: Opposition to SUSMP Numeric Limits

Dear Mr. Dickerson:

The City of Irwindale (hereinafter "City") understands that the regional board will be considering incorporating numeric limits into the Standard Urban Stormwater Mitigation Plan (SUSMP) at its September 16, 1999 meeting. The numeric limits proposed by regional board staff are aimed at retaining and/or treating .75" of storm water during a 24-hour storm event from seven (7) categories of new developments.[1] The City also understands that the County of Los Angeles -- the principal permittee under the Los Angeles County Municipal NPDES Permit ("NPDES permit") -- has already agreed to this standard by way of its settlement agreement with the environmental community.

The City writes to inform you of its opposition to this proposed requirement for the following reasons:

The NPDES permit contains no language requiring cities to retain/treat any volume of storm water runoff from new developments.

No other municipal permit requires a numeric limit for the retention or treatment of storm water runoff.

Although other counties in California, such as Alameda and Ventura, require post-construction controls for new developments, they allow cities broad discretion in determining which types of projects and structural controls to impose on developers.

Although the City of Santa Monica has required numeric limits on retaining/treating storm water runoff through rigid runoff coefficients, its experience with developers has proven that such

[1]Gas stations; restaurants; automotive repair facilities (including parts shops); 10-99 home sub-divisions; 100-plus home sub-divisions; single home hillside developments; and 100,000 square feet commercial developments.

requirements are difficult to meet.[2]

If approved, the numeric limits would require cities to impose upon 7 types of new developments costly structural controls (infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof), without regard for whether such controls are needed or whether they would be effective or necessary insofar as protecting a beneficial use of a receiving water.

The structural controls required to meet a numeric retention/treatment limit would (1) require a high degree of maintenance, for which cities would be responsible for enforcing; and (2) if not properly maintained, such controls could become sources of pollution rather than pollution mitigants.

The numeric limits constitute an unfunded state mandate and have not been evaluated for cost-effectiveness -- as required under California law.

The numeric limits now being considered were not based on science or engineering, but on a negotiated agreement, and are therefore arbitrary.

The structural controls necessitated by numeric limits would be required without regard to siting factors (soil conditions and other environmental considerations).[3]

The use of some structural controls such as detention basins/ponds and vegetative buffers are even more undesirable because they reduce amount of developable space.

Because cities and developers have little experience in the use of detention/treatment structural controls -- coupled with the fact that the SUSMP would require their immediate imposition -- there is the danger that such controls could be mis-prescribed, as has happened in other parts of the country.

It should also be noted that the NPDES municipal permit Executive Advisory Committee (EAC) has also taken a position against numeric limits.

The City is aware that the regional board is under pressure to approve the Standard Urban Storm Water Mitigation Plans because the permit requires approval by July 30, 1999. Given the

---

[2]Many developers in Santa Monica found the runoff coefficient-type numeric limits impossible to meet. The City of Santa Monica has exempted developers from this requirement in exchange for contributing money to the construction of a low-flow dry weather diversion system.

[3]For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Further, if a detention basin, pond, or similar device were sited in an area where underlying soil contains a high degree of clay, the detained storm water could pond, thereby attracting vectors such as mosquitoes. This could pose a serious health problem, especially if the device is sited in a mosquito abatement district.

aforementioned problems associated with numeric limits, their absence in the SUSMPs would be in the best interest of this and other cities. This subject could be reopened for evaluation during discussion of the next municipal NPDES -- presumably against a more objective background.

Lastly, it is recommended that in the future regional board staff provide cities with sufficient time to allow the Council of Governments (COGs) to review and comment on NPDES permit issues bearing a significant cost impact. Because the COGs meet monthly, 30 days notice is simply not enough time for member cities to take action on such important issues. As you know, this was an issue raised by the City of Long Beach in its writ of mandate complaint against the regional board. And as you may also be aware, two years ago the Southern California Association of Governments (SCAG) petitioned the State Water Resources Control Board to involve SCAG and its sub-regional COGs in the discussion of NPDES permit matters. This is because storm water management is an important regional planning issue that should involve SCAG, a regional planning agency.[4]

Should you have any questions, please feel free to contact me.

Sincerely,

Robert Griego
City Manager

[4]The Clean Water Act requires involvement of regional planning agencies such as SCAG in the development of municipal NPDES permits.

RECEIVED

1999 DEC 23 P 2:56

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Mayor
Carol Liu

Mayor Pro Tem
David A. Spence

City Council
Jerry G. Martin
Deborah K. Orlik
Anthony J. Portantino

December 21, 1999

Mr. Dennis Dickerson
Executive Director
California Regional Water
Quality Control Board – Los Angeles
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Proposed Standard Urban Storm Water Mitigation Plans (SUSMP's)

Dear Mr. Dickerson:

I am writing to address my understanding of the controversial ¾-inch figure you are proposing to include in the Los Angeles County SUSMP's. Several people have called this figure a "numerical limit". If this figure were a "numerical limit" I would join the battle against it.

A "numerical limit" is an enforcement target, which establishes the maximum quantity of a pollutant that may be present in storm runoff to be in compliance with a regulatory permit. The ¾-inch figure does not impose that burden on permittee's. If samples of storm water runoff are taken from a drainage system in Los Angeles County the testing agency cannot determine if any pollutants were caused by the ¾-inch of runoff from sites upstream. The storm runoff cannot be tested in that way.

I believe that the figure is in fact a "design standard" to be used by designers and cities alike to establish the amount of runoff that must be "treated" by priority projects, as defined in the Los Angeles County NPDES permit. The use of a design standard will allow all applicants to obtain uniform and fair treatment in every City that they approach. Currently, several cities are known to be strong proponents of Clean Water and enforce stringent rules on new development. Most cities comply with the permit requirements, but do not have well established design standards to reference. Thus, differing levels of compliance are obtained on the same issue. This unequal enforcement is not a problem as long as the minimum level of enforcement complies with relevant standards.

R0069050

1327 Foothill Boulevard • La Cañada Flintridge • California 91011-2137 • (818) 790-8880 • FAX: (818) 790-7536

A "design standard" is a tool to be used by designers and cities alike. As a design tool engineer and other design professionals can use their professional judgement to assure that the "design standard" is applied in a fair manner. The design professional identifying a problem with the standard as it would apply to his project can present facts to the City for consideration. If the City is convinced of the logic of an argument it can grant approval for an alternative design.

This flexibility is the key difference between a "numerical limit" and a "design standard". Professional judgement cannot be applied to a "numerical limit". I would encourage the Board to recognize ¾-inch rainfall as a design standard to be used to design facilities.

I will not be able to attend the Boards hearing on January 26, 2000, but I feel strongly that the reaction to the ¾-inch figure as a "numerical limit" is wrong.

Sincerely

CITY OF LA CAÑADA FLINTRIDGE

Elroy L. Kiepke
City Engineer

Wayne E. Piercy
Vice Mayor

Marc Titel
Council Member

Larry Van Nostran
Council Member

Robert G. Wagner
Council Member

Joseph Esquivel
Mayor

September 1, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: OPPOSITION TO NUMERICAL MITIGATION MEASURES

Dear Mr. Dickerson:

The City of Lakewood would like to express our strong opposition to the recommendation by Regional Board staff to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs). As you know, the Development Planning Model Program required the County, in consultation with Cities, to develop the SUSMPs for seven types of projects listed in the current NPDES Permit. After months of development and countless meetings, Los Angeles County, on behalf of Permittees, submitted the SUSMPs for your approval on July 22,1999 with revisions made on August 12, 1999. As submitted and revised, the SUSMPs did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMPs and was intentionally left out for numerous reasons that will be discussed below.

As proposed, the numeric mitigation measures would require cities to impose on developers and/or property owners structural Best Management Practices (BMPs) aimed at retaining and/or treating the first .75 inches of rainfall within a 24-hour storm event for the following projects: 100^{+} Home Subdivision; 10-99 Home Subdivision; $100{,}000^{+}$ Square-Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant; or Hillside-Located Single-Family Dwelling. Such BMPs would be extremely costly, both in terms of construction and on-going maintenance.

Lakewood strongly opposes the proposed language for the following reasons:

- The current Los Angeles County NPDES Permit, like all other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat stormwater runoff from new developments. Lakewood feels Board staff has decided to propose such language as a result of pressure from the environmental community and not sound science or engineering practices. Lakewood strongly urges the Regional Board to ask staff what data was used in determining the need for such standards and the level at which the standards were set. In light of the lack of region specific studies, detailed cost-benefit analysis and a decisive link between such mitigation measures and improvement of our receiving waters, the Board should reject the proposed recommendation.

5050 N. Clark Avenue, Lakewood, CA 90712 • (562) 866-9771 • Fax (562) 866-0505 • Email: Service1@LakewoodCity.org

- While other NPDES permits, such as Alameda and Ventura Counties, require post-construction controls for new developments, both permits afford city discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for many years. Having recently suffered through the downsizing of the defense industry, State take-aways and the worst recession in modern times, Lakewood can ill afford to implement any requirements that could jeopardize our recent achievements in the economic development arena. Without thorough studies on the effects of such requirements on economic development in the region, such action by the Board will be strongly opposed by local government and the interests they represent.

- As it stands, incorporation of the proposed language will tie the hands of cities and impose standards in Los Angeles County that are not found anywhere else in the State. Economic development will not only suffer on a local basis, but as a region Los Angeles County stands to lose both jobs and revenue to neighboring counties where similar requirements are nonexistent.

  The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers will simply move to Orange, Riverside or Ventura counties to escape the unjustified requirements should they be approved.

- Similar types of requirements have been tried and found to be nearly impossible to implement without some flexibility. The City of Santa Monica requires the retaining and/or treatment of stormwater runoff based on similar numeric mitigation measures to the ones proposed by Board staff. The City of Santa Monica used a runoff coefficient formula to determine what structural controls must be constructed on all development projects. Based on the difficulty developers had in siting the necessary facilities and meeting the goals of the program, the city modified the program to allow developers to make monetary contribution towards the construction of a low-flow dry weather treatment facility.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded state mandate. As such, the requirements should have been subject to the same cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities. Lacking such analysis, Lakewood feels the numeric measures being considered were not based on science or engineering practices, but are arbitrary and a direct result of the influence of the environmental community on Board staff.

- The structural controls necessitated by numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

Lakewood is aware that the Regional Board is under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Given the aforementioned concerns and associated questions with regards to the incorporation of the numeric mitigation measures, Lakewood supports the approval of the SUSMPs as originally submitted by the Los Angeles County without the problematic numeric measures.

As a follow-up to this letter and to more formally express Lakewood's opposition to the proposed numeric measures, the Lakewood City Council is scheduled to adopt a Resolution opposing such measures at its September 14th meeting. The Resolution will be presented to the Regional Board at their September 16th meeting to be formally entered into the public record.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation. Hopefully such research could be completed before the issuance of the next municipal permit scheduled in two years.

Lakewood would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government. Hopefully, you will agree with us that without supportive evidence that such requirements will achieve measurable goals and the cost benefit analysis justifies such mandates, the issue should be tabled.

Should you have any questions regarding Lakewood's position, please contact Scott K. Pomrehn, Senior Management Analyst, at 562-866-9771, extension 3507.

Respectfully,

Joseph Esquivel

Joseph Esquivel
Mayor

CITY OF
LA MIRADA

City Hall
13700 La Mirada Boulevard
La Mirada, California 90638
P.O. Box 828
La Mirada, California 90637-0828
(562) 943-0131 FAX (562) 943-1464

Dedicated to Service

September 9, 1999

Mr. Dennis Dickerson, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: STANDARD URBAN STORM WATER MITIGATION PLANS

Dear Mr. Dickerson:

Please be advised that the City Council of the City of La Mirada, at its regular meeting of September 7, 1999, adopted Resolution No. 99-58 urging the California Regional Water Quality Board, Los Angeles Region, not to impose numeric limits on the treatment or retention of storm water runoff from new developments.

Enclosed is a certified copy of the Resolution. If we can provide any additional information, please do not hesitate to contact the undersigned,

Very truly yours,

CITY OF LA MIRADA

Marilyn L. Wagner
City Clerk

Enclosure

cc: Mr. Gary Sloan, City Manager
Mr. Gerald R. Winterburn, Assistant City Manager/Director of Planning

R0069055

BOB CHOTINER Mayor | DR. C. DAVID PETERS Mayor Pro Tem | PETE DAMES Councilman | STEVE JONES Councilman | HAL MALKIN Councilman | GARY K. SLOAN City Manager

RESOLUTION NO 99-58

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LA MIRADA URGING THE CALIFORNIA REGIONAL WATER QUALITY BOARD, LOS ANGELES REGION, NOT TO IMPOSE NUMERIC LIMITS ON THE TREATMENT OR RETENTION OF STORM WATER RUNOFF FROM NEW DEVELOPMENTS PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL NPDES PERMIT

A. **Recitals.**

(i) The California Regional Water Quality Control Board, Los Angeles Region ("regional board") is considering the incorporation of numeric limits into the Standard Urban Storm Water Runoff Mitigation Plan component of the model development planning program as required by the Los Angeles County Municipal NPDES permit ("municipal NPDES permit"); and

(ii) Such numeric limits are intended to retain or treat storm water runoff volume (either .60" or .75" OF rain) from seven categories of new development projects including gas stations, restaurants, auto repair facilities, 10-99 housing subdivisions, 100-plus housing subdivisions, single-family hillside homes, and 100,000 square foot commercial development; and

(iii) Meeting the proposed numeric limits would necessitate the imposition of structural controls on new developments, including but not limited to extended detention basins, wet ponds, infiltration basins/ponds (reducing the amount of developable space), storm drain-connected oil/grift separators, catch basin inserts, grassy swales, and other devices many of which have not been proven to be cost-effective; and

(iv) Such structural controls would require post-construction operation and maintenance which cities would be required to enforce; and if not properly designed or maintained, could become sources of pollution rather than pollution mitigants; and

(v) Storm water treatment and retention numeric limits are not specifically mandated in the municipal NPDES permit and are not a requirement associated with other municipal NPDES permits issued in the State of California; and

(vi) Neither the regional board nor any other interested party has provided compelling justification for the use of numeric limits for treating or retaining storm water runoff from new developments;

(vii) Neither the regional board nor any other interested party has demonstrated that storm water retention/treatment numeric limits would result in the improvement or protection of a beneficial use of a receiving water; and

(viii) Imposing such unproven and questionable numeric limits on cities constitutes an unfunded state mandate which has not been evaluated in cost-effective terms as required by State law.

B. Resolution

NOW, THEREFORE, BE IT FOUND, DETERMINED AND RESOLVED as follows:

1. The City Council of the City of La Mirada hereby advises the regional board members of its opposition to storm water treatment/retention numeric limits; and

2. The City Council of the City of La Mirada recommends that the regional board approve the Standard Urban Storm Water Mitigation Plan, which does not include numeric limits, as proposed by the Executive Advisory Committee on August 11, 1999.

APPROVED AND ADOPTED this 7th day of September, 1999.

/s/_____
Mayor Chotiner

ATTEST:

I, MARILYN L. WAGNER, City Clerk of the City of La Mirada do hereby certify that the foregoing Resolution was adopted at a regular meeting of the City Council of the City of La Mirada held on the 7th day of September, 1999.
MOTION CARRIED BY THE FOLLOWING ROLL CALL VOTE:

AYES:	**Councilmembers: Dames, Jones, Malkin, Mayor pro tem Peters, and Mayor Chotiner**
NOES:	**None**
ABSENT:	**None**

Marilyn L. Wagner
Marilyn L. Wagner, City Clerk

C I T Y O F
L A M I R A D A

City Hall
13700 La Mirada Boulevard
La Mirada, California 90638
P.O. Box 828
La Mirada, California 90637-0828
(562) 943-0131 FAX (562) 943-1464

Dedicated to Service

September 3, 1999

Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

SUBJECT: STANDARD URBAN STORM WATER MITIGATION PLAN OPPOSITION TO PROPOSED SUSMP NUMERIC LIMITS

Dear Mr. Dickerson:

The City of La Mirada (hereinafter "City") understands that the regional board will be considering incorporating numeric limits into the Standard Urban Storm Water Mitigation Plan (SUSMP) at its September 16, 1999 meeting. The numeric limits proposed by regional board staff are aimed at retaining and/or treating .75" of storm water during a 24-hour storm event from seven (7) categories of new developments. The City also understands that the County of Los Angeles - the principal permittee under the Los Angeles County Municipal NPDES Permit ("NPDES permit") - has already agreed to this standard by way of its settlement agreement with the environmental community.

The City hereby informs you of its strong opposition to this proposed requirement for the following reasons:

- The NPDES permit contains no language requiring cities to retain/treat any volume of storm water runoff from new developments.
- No other municipal permit in California requires a numeric limit for the retention or treatment of storm water runoff.
- Although other counties in California, such as Alameda and Ventura, require post-construction controls for new developments, they afford cities broad discretion in determining which types of projects and structural controls to impose on developers.
- Numeric limits would require cities to impose costly structural controls on new developments such as infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof, without regard for whether such controls are needed or whether they would be effective or necessary insofar as protecting a beneficial use of receiving water.

R0069058

BOB CHOTINER, Mayor | DR. C. DAVID PETERS, Mayor Pro Tem | PETE DAMES, Councilman | STEVE JONES, Councilman | HAL MALKIN, Councilman | GARY K. SLOAN, City Manager

- The structural controls required to meet a numeric retention/treatment limit would (1) require a high degree of maintenance, which cities would be responsible for enforcing; and (2) if not properly maintained, could become sources of pollution rather than pollution mitigants.

- The numeric limits now being considered were not based on science or engineering but on a negotiated agreement and are therefore arbitrary.

- The structural controls necessitated by numeric limits would be required without regard to siting factors (soil conditions and other environmental considerations).

The City is aware that the regional board is under pressure to approve the Standard Urban Storm Water Mitigation Plans but given the aforementioned problems associated with numeric limits, their absence in the SUSMPS would be in the best interest of this and other cities. This subject could be reopened for evaluation during discussion of the next municipal NPDES - presumably against a more objective background.

The City respectfully requests in the future the board staff involve the Council of Governments (COGs) to review and comment on NPDES permit issues bearing a significant cost impact. Because the COGs meet monthly, 30 days notice is simply not enough time for member cities to take action on such important issues. As you know, this was an issue raised by the City of Long Beach in its writ of mandate complaint against the regional board.

The City understands that two years ago the Southern California Association of Governments (SCAG) petitioned the State Water Resources Control Board to involve it and its sub-regional COGs in the discussion of NPDES permit matters. This action was taken because storm water management is an important regional planning issue that demands the involvement of SCAG, a regional planning agency.

Your consideration in ensuring that these numeric limits will not be included in the SUSMP, thereby adversely affecting the City of La Mirada will be greatly appreciated.

Sincerely,

CITY OF LA MIRADA

Gary K. Sloan
City Manager

R0069059

GKS:pda

CITY COUNCIL

KEN BLACKWOOD
MARGARET ESTRADA
ROBERT T. HARGRAVE
TIMOTHY KING
BEN TRAINA

CITY OF LOMITA

ADMINISTRATION

MICHAEL O'CONNOR
CITY ADMINISTRATOR

DAWN TOMITA
CITY CLERK

September 9, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 W. 4th Street Suite 200
Los Angeles, CA 90013

Subject: Opposition to SUSMP Numeric Limits

Dear Mr. Dickerson:

The City of Lomita (hereinafter "City") understands that the regional board will be considering incorporating numeric limits into the Standard Urban Stormwater Mitigation Plan (SUSMP) at its September 16, 1999 meeting. The numeric limits proposed by regional board staff are aimed at retaining and/or treating .75" of storm water during a 24-hour storm event from seven (7) categories of new developments.[1] The City also understands that the County of Los Angeles -- the principal permittee under the Los Angeles County Municipal NPDES Permit ("NPDES permit") -- has already agreed to this standard by way of its settlement agreement with the environmental community.

The City writes to inform you of its opposition to this proposed requirement for the following reasons:

- The NPDES permit contains no language requiring cities to retain/treat any volume of storm water runoff from new developments.
- No other municipal permit in California requires a numeric limit for the retention or treatment of storm water runoff.
- Although other counties in California, such as Alameda and Ventura, require post-construction controls for new developments, they afford cities broad discretion in determining which types of projects and structural controls to impose on developers.

[1]Gas stations; restaurants; automotive repair facilities (including parts shops); 10-99 home sub-divisions; 100-plus home sub-divisions; single home hillside developments; and 100,000 square feet commercial developments.

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- Although the City of Santa Monica has required numeric limits on retaining/treating storm water runoff through rigid runoff coefficients, its experience with developers has proven that such requirements are difficult to meet.[2]

- If approved, the numeric limits would require cities to impose upon 7 types of new developments costly structural controls (infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof), without regard for whether such controls are needed or whether they would be effective or necessary insofar as protecting a beneficial use of a receiving water.

- The structural controls required to meet a numeric retention/treatment limit would (1) require a high degree of maintenance, which cities would be responsible for enforcing; and (2) if not properly maintained, could become sources of pollution rather than pollution mitigants.

- The numeric limits constitute an unfunded state mandate and have not been evaluated for cost-effectiveness -- as required under California law.

- The numeric limits now being considered were not based on science or engineering, but on a negotiated agreement, and are therefore arbitrary.

- The structural controls necessitated by numeric limits would be required without regard to siting factors (soil conditions and other environmental considerations).[3]

- The use of some structural controls such as detention basins/ponds and vegetative buffers are even more undesirable because they reduce the amount of developable area.

- Because cities and developers have little experience in the use of detention/treatment structural controls -- coupled with the fact that the SUSMP would require their immediate imposition -- there is the danger that such controls could be mis-prescribed, as has happened in other parts of the country.

It should also be noted that the NPDES municipal permit Executive Advisory Committee (EAC) has also taken a position against numeric limits.

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[2]Many developers in Santa Monica found the runoff coefficient-type numeric limits impossible to meet. The City of Santa Monica has exempted developers from this requirement in exchange for contributing money to the construction of a low-flow dry weather diversion system.

[3]For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Further, if a detention basin, pond, or similar device were sited in an area where underlying soil contains a high degree of clay, the detained storm water could pond, thereby attracting vectors such as mosquitoes. This could pose a serious health problem, especially if the device is sited in a mosquito abatement district.

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The City is aware that the regional board is under pressure to approve the Standard Urban Storm Water Mitigation Plans because the permit requires approval by July 30, 1999. Given the aforementioned problems associated with numeric limits, their absence in the SUSMPs would be in the best interest of this and other cities. This subject could be reopened for evaluation during discussion of the next municipal NPDES -- presumably against a more objective background.

Lastly, in the future regional board staff should provide cities sufficient time to allow the Council of Governments (COGs) to review and comment on NPDES permit issues bearing a significant cost impact. Because the COGs meet monthly, 30 days notice is simply not enough time for member cities to take action on such important issues. As you know, this was an issue raised by the City of Long Beach in its writ of mandate complaint against the regional board.

And as you may also be aware, two years ago the Southern California Association of Governments (SCAG) petitioned the State Water Resources Control Board to involve it and its sub-regional COGs in the discussion of NPDES permit matters. This action was taken because storm water management is an important regional planning issue that demands the involvement of SCAG, a regional planning agency.[4]

Should you have any questions, please feel free to contact me.

Sincerely,

Gary D. Irwin
Assistant City Administrator

[4]The Clean Water Act requires involvement of regional planning agencies such as SCAG in the development of municipal NPDES permits.

OFFICE OF THE CITY ATTORNEY
Long Beach, California

2000 JAN 14 P 4:16

ROBERT E. SHANNON
City Attorney

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Assistant City Attorney

Barbara D. de Jong
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Lisa Peskay Malmsten
Belinda R. Mayes
James N. McCabe
Susan C. Oakley
J. Charles Parkin
Michael M. Peters
Carol A. Shaw

January 14, 2000

VIA FAX

Dennis A. Dickerson
Executive Officer
California Regional Water Quality
Control Board
101 Centre Plaza Drive
Monterey Park, CA 91754-2156

Re: **Standard Urban Stormwater Mitigation Plans (SUSMPs) for the City of Long Beach**

Dear Mr. Dickerson:

Please provide copies of this letter to the members of the Board and include it in the administrative record of the hearing on the above subject.

The City of Long Beach thanks the Regional Board and its staff for its efforts on behalf of stormwater runoff pollution mitigation. As part of its own continuing efforts in this regard, the City of Long Beach requests that the following comments be considered and addressed in the adoption of SUSMPs for the City of Long Beach as part of its separate permit. The primary issues, which will be elaborated upon in the body of this letter, are:

1. The findings contained in the Tentative Resolution should be revised to remove confusing references to "the permit" when two permits, Regional Board Order No. 96-054 (the "Countywide Permit") and Regional Board Order No. 99-060 (the "City of Long Beach Permit")are affected.

2. Pursuant to prior agreement, the implementation dates for those SUSMPs applicable to the City of Long Beach must be concurrent with those for the cities subject to the Countywide permit to avoid putting the City at an economic disadvantage.

3. The inclusion of numerical design standards as minimum design criteria should be deferred until such time as empirical data on the efficacy of such standards, obtained in this region or another region with a similar climate, is available.

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The Findings

The findings in the Tentative Resolution should be revised to reflect that two separate permits are affected by this resolution. These two permits were reached through two very different processes, and contain different procedures for modification and implementation. Finding 21 should be revised to reflect this. Similarly, Finding 13 should separately identify "Priority Projects" for each permit. Finding 5 should be revised to include references to the City of Long Beach, its receiving waters, its monitoring program, and its permit.

Implementation of SUSMP Requirements for the City of Long Beach

During negotiations for the settlement of the litigation between the City of Long Beach and the Regional Board, it was agreed that SUSMP requirements for the City would not take effect prior to the effective date for SUSMPs under the Countywide Permit. This issue arose during the hearing which resulted on the City of Long Beach's proposed permit, at which time it was agreed that the City should not be placed at an economic disadvantage by having its SUSMP effective prior to the requirements affecting the majority of the County. Members of the Regional Board staff have confirmed this sequence of events, which should be reflected in the Board's resolution. The Tentative Resolution is silent as to the implementation schedule for the SUSMP for the City of Long Beach.

The Countywide Permit anticipated that SUSMPs would be implemented 90 days following the next fiscal year following their adoption but no later than July 1999. While the City acknowledges that this date has past, a similar schedule of implementation is needed to avoid anticipated "taking" or related challenges from affected parties who have already initiated the planning review process with the City, development requirements should be scheduled to be implemented no sooner than 90 days following the start of the next fiscal year, but no sooner than the implementation date adopted under the Countywide Permit.

Numerical Design Standards

The adoption of numerical design standards as minimum design criteria is not supported by relevant empirical data or by any cost-benefit analysis. For these reasons, it fails to comport with either State or Federal law. Inclusion of numerical design standards as a voluntary standard or as part of an incentive program would assist in the collection of data relevant to this region and provide cities with a legal basis on which to defend the requirement.

Comments Submitted by the Executive Advisory Committee

As you are aware, the City of Long Beach has been an active participant in the development of the SUSMPs through the Executive Advisory Committee. To the extent that they apply to the four priority project categories contained in the City of Long Beach Permit, we join in the concerns expressed by the Executive Advisory Committee and its counsel.

We appreciate the opportunity to submit these comments as part of the administrative record for the January 26th hearing and hope you will give them thoughtful consideration. The City of Long Beach reserves the right to submit further comments at the hearing. Thank you for your efforts.

Very truly yours,

ROBERT E. SHANNON, City Attorney

By
LISA PESKAY MALMSTEN
Deputy City Attorney

LPM:et

CITY OF LONG BEACH

DEPARTMENT OF PUBLIC WORKS

333 WEST OCEAN BOULEVARD • LONG BEACH, CA 90802 • (562) 570-6383 • FAX (562) 570-6012

January 13, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

RE: Request for Clarification of items in your letter dated December 7, 1999 and in the Tentative Resolution document

Dear Mr. Dickerson,

Two critical areas of ambiguity have arisen in connection with your letter of December 7, 1999 and the Tentative Resolution document as it pertains to the City of Long Beach. This letter reflects the clarifications, provided under your direction, by Dr. Xavier Swamikannu to Rose Collins, Clean Water Program Manager, for the City of Long Beach in a telephone conference on December 10,1999, and seeks confirmation of these clarifications. This letter is not intended to constitute the City's comments pursuant to your invitation for public comment on the Tentative Resolution.

The first area of ambiguity concerns the statement contained in the Tentative Resolution, page 2 of 17, which states:"This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES permit." Our understanding is that, as to Long Beach, the only project categories to which the Standard Urban Mitigation Plan (SUSMP) will apply are:

a. 10-99 home subdivisions
b. 100 or more home subdivisions
c. 100,000 or more square foot commercial developments, and
d. environmentally sensitive areas.

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Consistent with the terms of the Long Beach permit, the additional project categories listed in the Tentative Resolution do not apply to the City of Long Beach. This understanding has been confirmed in an internet e-mail on December 13,1999, by Dr.Swamikannu.

Second, on the first page of your December 7th letter, you state:

> If adopted by the Regional Board, the Tentative Resolution would approve the City of Long Beach Standard Urban Stormwater Mitigation Plan (SUSMP) while encouraging the Executive Officer to approve the Los Angeles Standard Urban Mitigation Plan.

During negotiations, all parties agreed that the City's SUSMP would not take effect prior to the effective date of the SUSMPs for the Countywide permit. This issue arose at the hearing of the City's permit as well, where it was again agreed that the City should not be placed at an economic disadvantage by having its SUSMP effective prior to that which affected the majority of the County. Dr. Swamikannu also confirmed, in a telephone conversation on December 10,1999, that the City of Long Beach SUSMP will become effective concurrently with the SUSMPs for the Countywide permit.

Please confirm that you agree with the clarifications herein by signing where indicated below and returning a copy to this office. Your courtesy and cooperation are appreciated.

Sincerely,

Edward T. Putz

EDWARD T. PUTZ
CITY ENGINEER

I confirm the clarifications contained in this letter.

Dated: _____

_____
Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region

ETP:rc

CITY OF LONG BEACH

DEPARTMENT OF PUBLIC WORKS

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September 10, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles CA 90013

Subject: Standard Urban Storm Water Mitigation Plans (SUSMPs) Submitted For Approval To The Executive Officer Under The Los Angeles County Municipal Storm Water Permit (Public Notice No. 99-047)

Dear Mr. Dickerson:

The City of Long Beach has reviewed the Regional Water Quality Control Board's proposal to incorporate numeric mitigation measures (the first 0.75 inches of rainfall within a 24-hour storm event) into the SUSMPs. While the City of Long Beach fully supports stormwater pollution reduction programs, we must express our concern with the numeric mitigation measures and offer some alternatives prior to the adoption of the SUSMPs.

On June 30, 1999 the California Water Quality Control Board unanimously adopted Order No 99-060 making the City of Long Beach the first City in Los Angeles County to administer and implement its own Municipal Stormwater Permit. The Permit already incorporates many BMPs and site specific SUSMP requirements. For example, at a minimum, peak runoff rates can not exceed pre-development levels, for developments where the potential for increased storm water discharge rates can result in an increase in downstream erosion potential and 25% of required landscape areas for new developments must be vegetated with xeriscape. Therefore, the City of Long Beach is fully committed to the development of citywide SUSMPs, for the specific development categories detailed in our Permit, and requests the Board to consider the following prior to adoption:

- Studies to determine the "Pollutants of Concern" from storm drains in local/regional receiving waters and their true impact on beneficial uses. Is the 0.75" runoff mitigation appropriate and effective?

- Site specific studies to determine the impacts of runoff mitigation on water tables, soils and other environmental concerns unique to certain areas/cities.

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- Studies to determine the 0.75" runoff mitigation's economic impact on new development and on Cities' economies implementing SUSMPs containing these numeric limits.

- Cost Analysis for the implementation and ongoing maintenance of Treatment Control BMPS.

- Cost benefit and effectiveness analysis of the 0.75" retention/treatment within the 24-hour period on the pollutants of concern on the receiving waters and impact on beneficial uses.

- Local/regional receiving water studies and multi-year region specific monitoring and related data collection.

The City of Long Beach supports the cities of Los Angeles and Lakewood, the San Gabriel COG, Gateway Cities COG and the Executive Advisory Committee in their opposition to the prescriptive measures and respectfully requests the Board give cities the opportunity to study and select programs that will result in real water quality improvements without significant unnecessary expenditures.

Sincerely,

Edward T. Putz

EDWARD T. PUTZ
CITY ENGINEER

ETP:lc
a:001-38.ltr

cc: Henry Taboada, City Manager
Raymond T. Holland, Director of Public Works
Eugene Zeller, Director of Planning and Building

CLA MEMORANDUM

DATE: January 24, 2000

TO: The Honorable City Council

FROM: Ronald F. Deaton RFD
Chief Legislative Analyst

RECOMMENDATIONS REGARDING THE LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD'S PROPOSED REVISIONS TO THE LOS ANGELES COUNTY STANDARD URBAN STORMWATER MITIGATION PLAN

The development of a Standard Urban Stormwater Mitigation Plan (SUSMP)is required by the Municipal Stormwater Permit (Permit), under which the City is one of 85 co-permitted Los Angles County municipalities. The cities are responsible for developing the SUSMP, with minimum requirements for the plan outlined in the Permit. The Executive Director of the Regional Water Quality Control Board, Los Angeles Region (RWQCB) has approval oversight of the SUSMP as meeting the requirements of the Permit. The SUSMP was presented by the County of Los Angeles (Principal Permittee) to the Executive Officer of the RWQCB for review.

The RWQCB Executive Officer has proposed significant modifications to the SUSMP, including mandating a numeric standard for rain water run-off retention/treatment, which was not supported by the co-permittee cities. The proposed numeric standard was discussed at the September 16, 1999, RWQCB Governing Board meeting. At that time the City expressed concern that the lack of information presented by the RWQCB regarding the proposed requirement prevented the City from being able to evaluate the appropriateness of the proposed requirement.

The RWQCB's most recent proposed SUSMP revision was released on December 7, 1999, with the staff report, which provides the supporting documentation, only being released January 18, 2000. The Chief Legislative Analyst (CLA) Office has reviewed the RWQCB proposed revisions to the SUSMP in coordination with the Bureau of Sanitation, Stormwater Management Division, within the context of the requirements of the Municipal Stormwater Permit which the City supported and the limited review period provided, and recommends the following for City Council action:

RECOMMENDATIONS:

1) City Council establish City policy:

a) Supporting implementation of a pilot program through the Standard Urban Stormwater Mitigation Plan for the Los Angeles County and Cities in Los Angeles County (SUSMP)

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requiring new commercial developments of 100,000 square feet or larger and new industrial facilities subject to General Permit as listed in 40 CFR 122.26(b)(14) (Phase I facilities) the requirements retain or treat approximately the volume of run-off produced from a 3/4 inch of rainfall in a 24 hour period (85% retention/treatment) with appropriate variance procedures and multi-media impact assessment provided, with the appropriateness of the requirement being re-evaluated upon the termination of the pilot program.

b) Supporting control of liquid leaks from on- and off-road vehicles/equipment at their source, rather than including parking lots in the SUSMP.

2) Request the Regional Water Quality Control Board, Los Angeles Region (RWQCB) to:

a) Pursue liquid leak source control measures for on- and off-road vehicles/equipment on a state and federal basis. Such controls should include public education efforts through the state smog-check program.

b) Establish a regional workgroup consisting of local governments, regulated industry, environmental groups, and other stakeholders as appropriate to establish recommended best management practice water quality monitoring protocols and methodologies to assess the costs and benefits of the 85% retention/treatment requirement during the pilot program, as well as other BMPs, for Board consideration. Recommended protocols should be released for a minimum of a 30-day public review prior to Board consideration.

c) As a responsible agency, review and comment on CEQA documents submitted to the LARWQCB.

d) Establish a policy requiring review, evaluation, and assessment of potential multi-media environmental impacts for all control measures contemplated by the Board. Such evaluation should be released for a minimum of a 30-day public review and comment prior to consideration of control measures by the Board.

e) Establish a regional ambient water quality monitoring program and implement BMP pilot programs for other sources.

3) City Council direct all City departments to:

a) as part of the "L.A. CEQA Threshold Guide" pilot program, to establish a standard California Quality Act mitigation measure requiring the retention and/or treatment of the volume of run-off produced from a 3/4 inch of rainfall in a 24 hour period (85% retention/treatment) for new commercial developments of 100,000 square feet or larger and new industrial facilities subject to the State's Stormwater Permit, with appropriate

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variances provided, and to report to the Stormwater Management Division regarding such projects.

b) to incorporate into all City owned development projects the 85% retention/treatment of rainfall run-off standard, as feasible, and report to the Bureau of Sanitation, Stormwater Management Division on all development projects, measures to be implemented to achieve the standard, costs, reasons for variances, and any difficulties/benefits associated with the requirement.

4) Direct the Bureau of Sanitation, Stormwater Management Division to:

a) track the implementation of the 85% retention/treatment requirement as it is implemented within the City, document costs, reasons for variances, and other information necessary to fully evaluate the control option.

b) monitor the water quality benefits of the 85% retention/treatment requirements at selected facilities, consistent with the protocols developed by the proposed RWQCB regional workgroup.

5) Direct the Chief Legislative Analyst Office, in coordination with the Bureau of Sanitation, to prepare and submit written comments, consistent with the policies set forth above and existing City policy, to the Los Angeles Regional Water quality Control Board on the proposed Standards Urban Stormwater Mitigation Plan for the Los Angeles County and Cities in Los Angeles County (SUSMP), by January 26, 2000.

Public Process

The RWQCB released a staff report in August 1999 regarding the proposed RWQCB revisions to the SUSMP. The report did not provide water quality or cost information, but rather cited several reports as justification for the proposal. However, when CLA staff visited the RWQCB offices in August, the reports were not available for public review. The City subsequently submitted a written request for a 30-day public review period for the data (see attached letter). The data was not made readily available for public review and comment prior to the September RWQCB Governing Board meeting where the proposed RWQCB revisions were discussed and the item continued.

The RWQCB subsequently released a revised SUSMP proposal on December 7, 1999. However, the City learned early in January 2000 that the RWQCB would not release the staff report with supporting information and data until January 14, 2000. The City immediately submitted a written request asking that 30-days be provided to review and comment on the staff report and associated data. The staff report was released January 18, 2000. The Governing Board of the RWQCB is scheduled to consider the proposed revisions to the SUSMP January 26, 2000.

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Proposed RWQCB SUSMP Revisions

Basically, the RWQCB proposed revisions to the SUSMP mandate a numeric standard of 85% retention and treatment of rain event run-off and introduces two new categories of projects that must be addressed and monitored by local governments through the SUSMP: parking lots of 25 spaces or greater and construction projects in environmentally sensitive areas. Specifically the RWQCB proposed revisions mandate that the following new development categories implement controls to achieve an 85% retention/treatment of rain event run-off:

- 10-100+ home subdivisions
- 100,000 square -foot commercial development
- automotive repair facilities
- retail gasoline outlets
- restaurant (greater than 5,000 square feet)
- parking lots with more than 25 spaces (or greater than 5,000 square feet)
- hillside located single family dwelling
- construction projects in environmentally sensitive areas

Issues

The main issues of concern raised by the cities, including the City of Los Angeles, and business and industry regarding the RWQCB proposed SUSMP revisions are the lack of water quality data, cost information, and evaluation of potential multi-media impacts available to evaluate the appropriateness of the proposed 85% retention/treatment requirement. In addition, there is uncertainty as to how the requirement would be achieved in practice and what structural best management practices would be appropriate. Potential impacts to small business is also of concern. Without the information to evaluate the proposal, the City is constrained in its ability to address the above issues. It is the responsibility of the RWQCB to disclose for public review and comment the information and data supporting its proposal.

The RWQCB staff report released on January 18, 2000, does not present any information regarding pollution reduction or control cost associated with the RWQCB's proposal. Rather the staff report cites various studies as a method of supporting and justifying the proposed revisions. Although the CLA's Office has not had adequate time to fully review the various studies cited in the January 18, 2000, RWQCB staff report, those we have reviewed appear to contradict, rather than support, the proposed revisions and clearly more information is needed.

The RWQCB staff report cites the City's Consent Decree -Strip Filter report dated March 16, 1999. The City's Bureau of Sanitation, Stormwater Management Division conducted a pilot program to test strip filters as a method of reducing pollution from parking lot run-off. The report concluded that "the strip-filter should be kept at an experimental stage. Maintenance frequency appears to be on a storm-to-storm level which is impractical." The report further indicates that the City continues

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to experiment to find an alternative design to assist in extending the useful performance of the structure. However, "at this stage of stormwater management research, the sand filter is not recommended for further implementation."

The RWQCB also cites the study "Results of a Retail Gasoline Outlet and Commercial Parking Lot Stormwater Runoff" (Western States Petroleum Association (WSPA) and American Petroleum Institute (1994). Although the CLA's Office does not have the study itself, we are in possession of two studies that discuss the WSPA study. Apparently the study concludes that fueling activities at normally operated and maintained retail gasoline stations do not contribute additional significant concentrations of measured constituents to stormwater run-off. In addition, the fuel related constituents from pump islands were either not detected or below the applicable maximum contaminant levels.

Finally, regarding the debate of which controls are most appropriate, there is some recent work done by Pat Ashley, a student of the California State University, Fullerton Environmental Studies program not discussed in the RWQCB staff report. Although the study is preliminary in nature, it appears to indicate that fuel island canopies may be as effective at reducing pollutants from gas stations as structural "treatment" controls. The results of the study further indicate that "there was no measurable difference in petroleum hydrocarbons for stormwater entering and existing station clarifiers." This clearly needs additional investigation, as it indicates the structural BMP has limited water quality benefit for those pollutants. It may however have benefits of reducing other pollutants of concern not tested for as part of the study.

Recommendations

Resolve Data Issues

Although it is not the responsibility of the City or the other co-permittees to obtain information to support proposed RWQCB regulations, to assist in moving stormwater quality programs forward it is recommended that the City support a pilot program requiring large commercial and industrial development projects to implement the 85% retention/treatment through the SUSMP as a method of collecting basic water quality data, cost information, and an understanding of implementation issues. Specifically the CLA recommends supporting implementation of a pilot program in the SUSMP requiring new commercial developments of 100,000 square feet or larger and new industrial facilities subject to General Permit as listed in 40 CFR 122.26(b)(14) (Phase I facilities) to retain or treat approximately 85% of rainfall run-off, with appropriate variance procedures and multi-media impact assessment provided, with the appropriateness of the requirement being re-evaluated upon the termination of the pilot program.

This will allow the opportunity to obtain basic data and information regarding the proposed 85% retention requirement. The requirement would be re-evaluated at the end of the pilot period to evaluate the appropriateness of the control, appropriate categories of variances (if any), and potential environmental impacts associated with implementation of the requirement. The duration of the pilot

period needs to be discussed as the program is initiated. The existing Permit expires in 18 months. It should be the goal to have information adequate to evaluate the 85% retention requirement for inclusion in the next permit. However, even with the immediate implementation of the requirement, development projects incorporating the requirement would most likely be just completing development within that time frame. Water quality testing would require that the quality of water during rain events be monitored. Therefore, the pilot period may need to be longer than 18 months.

It has been the City's experience that "one size does not fit all." Variances from City, air quality management district, and other regulatory agency requirements have always been accommodated. Therefore, there needs to be an opportunity to determine when variance from the retention/treatment requirement may be appropriate. It has been discussed that in areas of high groundwater or high liquefaction potential certain controls may not be appropriate. In addition, it may be determined that due to construction constraints a lower level of retention, such as 50%, may be appropriate. Finally, since the benefits of the water pollution/treatment are currently uncertain, if controls become too expensive, it may be appropriate to allow less expensive control options. It is recommended that developers be allowed to appeal to the Stormwater Management Division for re-evaluation if the 85% retention/treatment requirement exceeds 0.5% of the total project costs during the pilot study period. There may be other cases, as the requirement is implemented, where it is determined appropriate for variance allowances.

Also of concern is that there has been no documented evaluation of the potential environmental impacts associated with the proposed retention/treatment requirement. Concern has been expressed regarding the potential for proposed retention-infiltration best management practices (BMP) to negatively impact groundwater. In addition, in some cases, such as treatment through grassy swells where suspended solid pollutants are reduced, there may be a potential to increase dissolved pollutants associated with herbicides and pesticides. Although these impacts are not currently envisioned as being insurmountable, clearly they warrant evaluation to ensure that BMPs are designed and engineered to address these issues. The BMP design and implementation requirements must be thoughtful to prevent new environmental problems, such as has been experienced with MTBE. The polit program would allow for such issues to be examined.

To ensure that the information collected and water quality testing methodology is consistent among agencies and not questioned at the end of the proposed pilot program, it is recommended that the City request the RWQCB to establish a regional workgroup consisting of local governments, regulated industry, environmental groups, and other stakeholders as appropriate to establish recommended best management practice water quality monitoring protocols and methodologies to assess the costs and benefits of the 85% retention/treatment requirement during the pilot program, as well as other BMPs, for Board consideration. Recommended protocols should be released for a minimum of a 30-day public review prior to Board consideration.

Without development of such basic data collection protocols and methodologies, the basic science of the stormwater program will always be at question, serving to delay needed water quality improvements with each proposed new requirement. Therefore, early development of such

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procedures and collection of baseline data is essential to the stormwater program.

It is further recommended that City request the RWQCB to establish a regional ambient water quality monitoring program. This network should be similar to the ambient air quality network administered by the South Coast Air Quality Management District, which measures air quality at representative locations throughout the air basin. Such baseline data would assist in measuring benefits of the stormwater program overall. It is anticipated, that as with the air quality program, as water quality improvements are documented the regulatory program will increase in credibility and gain more public support. The ambient monitoring will also assist in providing baseline scientific data for the upcoming total maximum daily load regulatory processes.

Finally, to gain additional experience with the retention/treatment requirement it is recommended that the City incorporate the 85% retention/treatment in all new City development projects as feasible. In addition, it is recommended that the City request the RWQCB to initiate pilot programs for other development categories, such as restaurants, gasoline stations, and housing developments with industry groups such as the California Restaurant Association, Western States Petroleum Association, and the Building Industry Association, and municipalities.

New Categories

The RWQCB proposes to add parking lots of 25 spaces or greater and construction projects in environmentally sensitive areas to the SUSMP. The 85-cities included parking lots of 200 spaces or greater and environmentally sensitive areas within the Model Development Program, a separate program required under the Permit, to address potential stormwater impacts associated with such projects. Therefore, large parking lot projects and projects in environmentally sensitive areas are not neglected, but handled through a separate review process, as determined appropriate by the 85 co-permittee cities.

As noted above, there is controversy as to the exact impact of commercial parking lots, let alone smaller lots. The City of Long Beach Municipal Stormwater Permit (Long Beach was issued a Permit independent of the other 85 co-permittee cities due to litigation) adopted recently includes a requirement to complete a parking lot study due to the controversy over parking lots. The study is scheduled for completion July, 2000. Therefore, including parking lots would appear to be premature without the study results. Also, as discussed above, the best technology for use to address parking lot run-off is still being researched.

Finally, controlling run-off from parking lots would serve to address a very small portion of vehicle related water quality problems. A much more comprehensive approach to address vehicle pollution would seem appropriate and would likely be more cost-effective and require less oversight by all regulatory agencies, thereby minimizing administrative and enforcement costs. The most effective method of water pollution control is to control pollutants at their source. Such control prevents pollutants from ever entering the environment. Source control requires regulation of the source itself, such as consumer products and on- and off-road vehicles, which is generally best

accomplished at the national or state level. National and state regulation of such sources creates a market large enough to sustain the substantial costs associated with research and development necessary to achieve pollutant free or reduced pollutant product reformulation. Regulation of sources on a local or state level cannot create such a market, making such controls too expensive for implementation.

The U.S. EPA and the State of California have successfully worked with engine and car manufactures to reduce vehicle air emissions. There may be opportunities to minimize vehicle/equipment leaks through vehicle modifications. This program could perhaps be supplemented through a public education program implemented in those areas that must comply with smog-check provisions of the Clean Air Act. Since vehicles are called in on a regular basis for emission testing, inspecting cars for leaks, and informing and educating vehicle operators as to the impacts of such leaks would result in minimal additional costs to the state program, while potentially resulting in substantial benefits to water quality. Such a source control approach is more practical and cost-efficient that trying to catch and treat urban run-off contaminated though contact with pollution on streets, highways, parking lots, and homes. It is therefore recommend that the City urge the RWQCB to work with the EPA and the State to undertake similar actions to address liquid leaks from cars, rather than implement parking lot treatment controls through the SUSMP at this time.

Development in environmentally sensitive areas is always difficult and requires special review. Since such projects are afforded special review, it was determined most appropriate to establish stormwater run-off requirements on a case-by-case basis through the planning process. This is consistent with the basic requirements of the Municipal Stormwater Permit.

City Actions

If the proposed RWQCB revisions to the SUSMP are passed by the RWQCB, the RWQCB is not responsible for implementing and enforcing the requirements on developers, rather cities are. The Stormwater Management Division believes that the City will need to adopt ordinances to implement the RWQCB proposed SUSMP requirements. This would require significant City resources, a California Environmental Quality Act (CEQA) evaluation, a public participation process, and Council action approving the ordinance.

It is anticipated that the technical controversy regarding actual water quality benefits and costs presented by business and industry would then the transferred to the City to resolve through its ordinance development process. However, the City Council's discretionary action would be partially constrained since the City would have a Permit requirement mandating that it implement such a measure. Such a regulatory process does not appear to be in the best interest of good public policy. Therefore, it is the recommendation of the CLA's Office that the City work with the RWQCB to document the technical information fundamental to establishing stormwater control requirements and that the RWQCB not adopt such requirements until they are supported by technical information that has been released for meaningful public review and comment.

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As the Stormwater Municipal permit was being negotiated and subsequently supported by the City, it was the recommendation of staff that the SUSMP requirement be implemented through the City's CEQA review process and not via ordinances. Implementation through CEQA would address those projects of greatest concern and minimize the new administrative infrastructure required to implement the program, therefore minimizing costs to the City for program implementation. The language in the Permit clearly reflects this intent by the City.

To implement the proposed 85% retention/treatment pilot program in the City through the City CEQA review processes as originally envisioned, it is recommended that the Council establish the retention and/or treatment of volume of run-off produced from a 3/4 inch of rainfall in a 24 hour period (85% of rainfall run-off) as a standard CEQA mitigation for new commercial developments of 100,000 square feet or larger and new Phase 1 industrial facilities through the "L.A. CEQA Threshold Guide" pilot program. The CEQA process provides the flexibility to accommodate "variances" and environmental multi-media impact review of the requirement.

As discussed above it is further recommended that the City require all City owned development projects (i.e. libraries, sanitation transfer yards, City office buildings, etc.) to include the 85% retention/treatment requirement where feasible to maximize the opportunity to obtain meaningful information prior to renewal of the Municipal Stormwater Permit. Finally, to ensure a coordinated approach to data collection, it is recommended that the Bureau of Sanitation, Stormwater Management Division be directed to monitor the City's implementation of the treatment/retention requirements and monitor water quality at selected developments to assess the benefits/difficulties of the requirement during the pilot period.

The SUSMP also contains several technical issues and jurisdictional issues appropriate for City comment, consistent with existing City policy. It is therefore recommended that the CLA's Office, in coordination with the Bureau of Sanitation, Stormwater Management Division be directed to submit written comments on the SUSMP, consistent with City policy, by January 26, 2000.

R0069078

City Council
of the
City of Los Angeles
City Hall
90012

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RUTH GALANTER
COUNCILMEMBER, SIXTH DISTRICT
PRESIDENT PRO TEMPORE

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2000 JAN 27 P 2:28

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2000 JAN 27 P 3:41
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

January 25, 2000

Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 w. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

I am writing to urge the board's approval of the proposed revisions to the Standard Urban Stormwater Mitigation Plan (SUSMP) submitted to you by Los Angeles County for your consideration. As you know, today I won unanimous approval of the Los Angeles City Council for a motion endorsing of a policy with an 85%/0.75 inch provision as the minimal acceptable standard for development planning.

I laud the work you and your staff have done to help make the goals of the Clean Water Act a reality. While the City of Los Angeles has concerns about certain aspects of the Board's proposal, I trust that the Board can resolve those concerns with City representatives and quickly implement a policy that reduces the insidious effects of stormwater runoff.

While I am proud that my colleagues joined me in calling for approval of your proposal, my feelings are even stronger than the City's consensus statement. I echo the call of several environmental groups and urge you to remove from the proposal the so-called "roofing exclusion."

Section 9 of the current proposal would allow developers to divert runoff from rooftops directly to stormdrains and to take credit for that volume of runoff as it if were being treated. I find this provision disturbing and feel it would allow treatment of less runoff and would actively encourage developers to increase the amount of impervious surface. I strongly urge you to reconsider the inclusion of this provision.

It is of urgent concern that swift and decisive action be taken to protect the environment and safeguard public health. With that modification, approval of your proposal will accomplish that.

Thank you for your time and consideration.

Sincerely,

RUTH GALANTER
President Pro Tempore
Councilmember, Sixth District

RG:mb

R0069079

cc: Mark Gold, Executive Director, Heal the Bay
Alex Helperin, Attorney, National Resources Defense Council
Steve Fleischli, Executive Director, Santa Monica Baykeeper

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CITY HALL
LOS ANGELES, CALIFORNIA 90012

January 26, 2000

Dennis Dickerson
Executive Officer
California Regional Water quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

The City of Los Angeles appreciates the opportunity to comment on the Regional Water Quality Control Board's (RWQCB) proposed revisions to the Standard Urban Stormwater Mitigation Plan (SUSMP) submitted by Los Angeles County for your consideration. The City Council of the City of Los Angeles acted today to support the expeditious implementation of programs and policies to reduce water pollution associated with urban-runoff. The City supports, in concept, the proposed requirement to retain or treat approximately the volume of run-off produced from a 3/4 inch of rainfall in a 24 hour period (85% retention/treatment) included in the proposed revisions to the SUSMP as a minimum acceptable standard for new development planning. However, there are several implementation issues that must be addressed to ensure that the proposed program is successful. The City therefore requests that the RWQCB Governing Board provide a 30-day extension to provide the City with the opportunity to work with RWQCB staff and other stakeholders to resolve implementation issues. The request for additional time to ensure development of a successfully implementable program is intended to minimize delay in the overall implementation of the program, and in no manner is intended to delay the water quality benefits we all seek and support.

Given the relatively large size of the City of Los Angeles and various environmental, public health and safety, and other concerns and mandates of municipalities, program flexibility will be essential to ensuring successful program implementation and integration into the existing City administrative infrastructure. The need for flexibility is also essential to being able to accommodate the different circumstances and abilities of cities of varying sizes, terrains, and resources. Flexibility is also essential to accommodating modifications to the program as additional data and experience is gained. This flexibility must include a firm commitment from the RWQCB Governing Board and

staff to re-evaluate the 85% retention/treatment standard as experience with the retention/treatment requirement is obtained and as the new Municipal Stormwater Permit is negotiated in July, 2001.

The requirements included in the proposed revised SUSMP are anticipated to be implemented by the City through ordinances. The process to draft and approve ordinances can be lengthy and provides several important opportunities for public participation. Therefore, the time frame provided for implementation of the program needs to also be flexible, providing municipalities the full opportunity to engage in their existing public processes and to address concerns expressed as appropriate.

The attached Motion adopted by City Council on January 25, 2000, and comments detail the implementation issues of greatest concern to the City. In addition, technical comments on the SUSMP language are provided.

The City appreciates and supports the substantial efforts of the RWQCB in moving programs to address urban run-off pollution forward. We do respectfully request however that the adoption of the SUSMP be delayed for approximately 30-days to provide adequate time to address the very important and essential implementation issues of the program. You consideration of the City's comments and requests is appreciated.

Very truly yours,

Ronald F. Deaton
Chief Legislative Analyst

CITY OF LOS ANGELES
TECHNICAL COMMENTS ON THE PROPOSED REVISIONS TO THE STANDARD URBAN STORMWATER MITIGATION PLANS (SUSMP)

GENERAL COMMENTS

Public Process

Development of proposed water quality requirements and regulations need to provide for a full and meaningful public participation process. Such a process needs to include the opportunity for the public and stakeholders to review the various documents and studies considered and evaluated by the RWQCB staff in development of regulatory proposals.

The RWQCB released a staff report in August 1999 regarding the proposed RWQCB revisions to the SUSMP. The report did not provide water quality or cost information, but rather cited several reports as justification for the proposal. However, when City staff visited the RWQCB offices in August, the reports were not available for public review. The City subsequently submitted a written request for a 30-day public review period for the data. The data was not made readily available for public review and comment prior to the September RWQCB Governing Board meeting where the proposed RWQCB revisions were discussed and the item continued.

The RWQCB subsequently released a revised SUSMP proposal on December 7, 1999. However, the City learned early in January 2000 that the RWQCB would not release the staff report with supporting information and data until January 14, 2000. The City immediately submitted a written request asking that 30-days be provided to review and comment on the staff report and associated data. The staff report was released January 18, 2000. The Governing Board of the RWQCB is scheduled to consider the proposed revisions to the SUSMP January 26, 2000.

Implementation Issues of Concern

There is uncertainty as to how the proposed requirement to retain or treat approximately the volume of run-off produced from a 3/4 inch of rainfall in a 24 hour period (85% retention/treatment) would be achieved in practice and what structural best management practices would be appropriate. Effective Best Management Practices that achieve the 85 retention/treatment must be identified for each of the proposed land-use categories.

The RWQCB staff report released on January 18, 2000, does not present any information regarding pollution reduction or control cost associated with the RWQCB's proposal. Rather the staff report cites various studies as a method of supporting and justifying the proposed revisions. Although the City has not had adequate time to fully review the various studies cited in the January 18, 2000, RWQCB staff report, those we have reviewed clearly indicate that more information is needed.

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The RWQCB staff report cites the City's Consent Decree -Strip Filter report dated March 16, 1999. The City's Bureau of Sanitation, Stormwater Management Division conducted a pilot program to test strip filters as a method of reducing pollution from parking lot run-off. The report concluded that "the strip-filter should be kept at an experimental stage. Maintenance frequency appears to be on a storm-to-storm level which is impractical." The report further indicates that the City continues to experiment to find an alternative design to assist in extending the useful performance of the structure. However, "at this stage of stormwater management research, the sand filter is not recommended for further implementation."

The RWQCB also cites the study "Results of a Retail Gasoline Outlet and Commercial Parking Lot Stormwater Runoff" (Western States Petroleum Association (WSPA) and American Petroleum Institute (1994). Apparently the study concludes that fueling activities at normally operated and maintained retail gasoline stations do not contribute additional significant concentrations of measured constituents to stormwater run-off. In addition, the fuel related constituents from pump islands were either not detected or below the applicable maximum contaminant levels.

Regarding the concern of which controls are most appropriate for retail gasoline outlets, there is some recent work done by Pat Ashley, a student of the California State University, Fullerton Environmental Studies program not discussed in the RWQCB staff report. Although the study is preliminary in nature, it appears to indicate that fuel island canopies may be as effective at reducing pollutants from gas stations as structural "treatment" controls. The results of the study further indicate that "there was no measurable difference in petroleum hydrocarbons for stormwater entering and existing station clarifiers." This clearly needs additional investigation, as it indicates the structural BMP has limited water quality benefit for those pollutants. It may however have benefits of reducing other pollutants of concern not tested for as part of the study.

It has been the City's experience that "one size does not fit all." Variances from City, air quality management district, and other regulatory agency requirements have always been accommodated. Therefore, there needs to be flexibility to accommodate variances from the retention/treatment requirement as appropriate. It has been discussed that in areas of high groundwater or high liquefaction potential certain controls may not be appropriate. In addition, it may be determined that due to construction constraints a lower level of retention, such as 50%, may be appropriate. Finally, since the benefits of the water pollution/treatment are currently uncertain, if controls become too expensive, it may be appropriate to allow less expensive control options. It is recommended that developers be allowed to appeal to the implementing municipality, in the City of the Los Angeles to Bureau of Sanitation, Stormwater Management Division, for re-evaluation if the 85% retention/treatment requirement exceeds 0.5% of the total project costs during the pilot study period. There may be other cases, as the requirement is implemented, where it is determined appropriate for variance allowances.

The City of Long Beach Municipal Stormwater Permit adopted recently includes a requirement to complete a parking lot study due to the controversy over parking lots. The study is scheduled for completion July, 2000. Therefore, including parking lots could appear to be premature without the

R0069083

study results. Also, as discussed above, the best technology for use to address parking lot run-off is still being researched.

The 85-cities included parking lots of 200 spaces or greater within the Model Development Program, a separate program required under the Permit, to address potential stormwater impacts associated with such projects. Therefore, large parking lot projects are not neglected, but handled through a separate review process, as determined appropriate by the 85 co-permittee cities. The appropriateness of this process in conjunction with the proposed vehicle source control programs (see comments below) should be re-evaluated by the RWQCB.

Although the City supports the proposed 85% retention/treatment control in concept, flexibility to accommodate the technical and cross-media impact uncertainties need to be provided to municipalities to ensure successful implementation of the program, protect against potential litigation, and protect against unintended impacts.

Potential Cross-Media Impacts

Also of concern is that there has been no documented evaluation of the potential environmental impacts associated with the proposed retention/treatment requirement. Concern has been expressed regarding the potential for proposed retention-infiltration best management practices (BMP) to negatively impact groundwater. In addition, in some cases, such as treatment through grassy swales where suspended solid pollutants are reduced, there may be a potential to increase dissolved pollutants associated with herbicides and pesticides. Although these impacts are not currently envisioned as being insurmountable, clearly they warrant evaluation to ensure that BMPs are designed and engineered to address these issues. The BMP design and implementation requirements must be thoughtful to prevent new environmental problems, such as has been experienced with MTBE.

Controlling Pollution at its Source Versus Land-Use Retention /Treatment Requirements

Controlling run-off from parking lots would serve to address a very small portion of vehicle related water quality problems. A much more comprehensive approach to address vehicle pollution would seem appropriate and would likely be more cost-effective and require less oversight by all regulatory agencies, thereby minimizing administrative and enforcement costs. The most effective method of water pollution control is to control pollutants at their source. Such control prevents pollutants from ever entering the environment. Source control requires regulation of the source itself, such as consumer products and on- and off-road vehicles, which is generally best accomplished at the national or state level. National and state regulation of such sources creates a market large enough to sustain the substantial costs associated with research and development necessary to achieve pollutant free or reduced pollutant product reformulation. Regulation of sources on a local or state level cannot create such a market, making such controls too expensive for implementation.

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The U.S. EPA and the State of California have successfully worked with engine and car manufactures to reduce vehicle air emissions. There may be opportunities to minimize vehicle/equipment leaks through vehicle modifications. This program could perhaps be supplemented through a public education program implemented in those areas that must comply with smog-check provisions of the Clean Air Act. Since vehicles are called in on a regular basis for emission testing, inspecting cars for leaks, and informing and educating vehicle operators as to the impacts of such leaks would result in minimal additional costs to the state program, while potentially resulting in substantial benefits to water quality. Such a source control approach is more practical and cost-efficient that trying to catch and treat urban run-off contaminated though contact with pollution on streets, highways, parking lots, and homes. The City therefore urges the RWQCB to work with the EPA and the State to undertake similar actions to address liquid leaks from cars, as a potential alternative to implementing parking lot treatment controls through the SUSMP at this time.

Administrative Implementation Issues

If the proposed RWQCB revisions to the SUSMP are passed by the RWQCB, the RWQCB is not responsible for implementing and enforcing the requirements on developers, rather cities are. The City anticipates adopting ordinances to implement the RWQCB proposed SUSMP requirements. This would require significant City resources, a California Environmental Quality Act (CEQA) evaluation, a public participation process, and Council action approving the ordinance. The process to draft and approve ordinances can be lengthy and provides several important opportunities for public participation. Therefore, the time frame provided for implementation of the program needs to also be flexible, providing municipalities the full opportunity to engage in their existing public processes, to address concerns expressed as appropriate, and comply with all administrative and legal requirements/procedures.

Data Gathering

To ensure that the information collected and water quality testing methodology is consistent among agencies, it is recommended that the RWQCB establish a regional workgroup consisting of local governments, regulated industry, environmental groups, and other stakeholders as appropriate to establish recommended best management practice water quality monitoring protocols and methodologies. Recommended protocols should be released for a minimum of a 30-day public review prior to Board consideration.

Without development of such basic data collection protocols and methodologies, the basic science of the stormwater program will always be at question, serving to delay needed water quality improvements with each proposed new requirement. Therefore, early development of such procedures and collection of baseline data is essential to the stormwater program.

It is further recommended that the RWQCB establish a regional ambient water quality monitoring program. This network should be similar to the ambient air quality network administered by the

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4-A

SUBSTITUTE MOTION

On a daily basis, massive amounts of pesticides, metal residue, oily waste and solid garbage flow into the ocean, polluting our coastal waters. Human viruses and bacteria sicken surfers, swimmers and young children at play in the Santa Monica Bay. The source of this pollution is urban runoff from our lawns, parking lots and streets. In fact, urban runoff is the leading cause of water pollution in our region.

Los Angeles County has the worst urban runoff problem in the nation. While significant efforts have been made in recent years to address the problem, too little progress has been made. The condition of Santa Monica Bay, the Long Beach Harbor, and the Los Angeles River is a disgrace.

We can change that.

On January 26, 2000, the California Regional Water Quality Control Board (RWQCB), Los Angeles Region, is expected to discuss a proposed Standard Urban Stormwater Mitigation Plan (SUSMP). The new standards are far-reaching and promise to increase significantly efforts to reduce the insidious effects of urban runoff.

Under the proposed new standards, cities would have to ensure that new developments capture either 85 percent of the runoff from a storm in a 24-hour period or the first three-fourths of an inch of rain. The standard would apply to new commercial projects of more than 100,000 square feet and all new gas stations, auto repair garages, restaurants and subdivisions of 10 or more houses.

Developers and city planners would have a range of options for compliance. They could leave grassy swales and other open space so runoff could seep into the ground instead of flowing into stormdrains. Developers could also seek other options, such as building detention ponds, using permeable pavement or installing filters in curbside drains. Experts contend that the proposed limits could be achieved with relatively simple and inexpensive design changes.

The proposed new standards make sense. Retaining stormwater on site, allowing it to percolate into the land, not only protects the ocean from pollution, but it also replenishes the groundwater supply, a major source of our drinking water.

During previous meetings of the RWQCB, the office of the Chief Legislative Analyst raised questions about details of the board's proposal. These comments were perceived by many as an official objection by the City of Los Angeles to a sound policy to protect the environment and public health and safety. An editorial in the Los Angeles Times (Oct. 6, 1999) excoriated the City for its position.

Granted, given the enormous size and varied terrain of the City of Los Angeles there are several questions and concerns the city should raise about the proposal. Those are: whether Best Management Practices (BMPs) are effective for parking lots, auto repair garages, restaurants, residences and gas stations; whether the RWQCB will pursue public education programs to reduce emissions from motor vehicles to streets and parking lots; whether the RWQCB will provide a variance process for unusual situations and circumstances, such as areas with high ground water or high liquefaction potential; whether the RWQCB will collect regional ambient water quality data to confirm the effectiveness of the 85th percentile-0.75 inch provision and refine their rules accordingly; and whether the RWQCB will allow for a flexible process for establishing runoff requirements through the planning process for unusual situations.

However, these concerns should not be interpreted as an objection to or opposition of the proposed 85 percent retention/treatment standard. Nor should those concerns be considered reason to unnecessarily delay or obstruct implementation of the board proposal. They should be seen, rather, as a request for additional information, data and analyses on the proposed standard and control measures to be implemented to achieve the standard. The City should assist the Board in obtaining the information necessary to support and implement a retention/treatment standard. The City should encourage the RWQCB to consider and address the City's concerns during its deliberations, but move quickly toward implementation of a policy that protects the environment and public health.

I THEREFORE MOVE that City Council adopt as City policy a position that endorses, in concept, the proposed Standard Urban Stormwater Mitigation Plan currently before the Regional Water Quality Control Board, including the 85th percentile/0.75-inch proposal as the minimal acceptable standard for development planning.

I FURTHER MOVE that the Council encourage Regional Water Quality Control Board to address the City's aforementioned concerns, and develop and implement as quickly as possible a policies that are flexible enough to consider the different circumstances and abilities of cities of varying sizes, terrains and resources, are supported by scientific data, and are subjected to meaningful public review and comment.

I FURTHER MOVE that the Chief Legislative Analyst report back on the status of the board's deliberations to the City Council's Committee on Environmental Quality and Waste Management.

Presented by _____
RUTH GALANTER
Councilmember, Sixth District

Seconded by _____

Tuesday, January 25, 2000

Design Standards for Treatment Control BMPs (Page 9 of 17)

Section 9 part B of the design criteria should be eliminated because the goal of an efficient BMP is improving quality of the runoff not controlling it. Although we concur with the concept, the permit does not include requirements for flood control, nor is flood control within the jurisdiction of the RWQCB. All standard design criteria given in scientific references for BMPs already include provisions for overflow capacity.

We agree with your decision to exempt some roofing surfaces for total area calculation. However, the fourth condition (part "d") will disallow almost all projects from qualifying for this exemption. The condition should be revised to read as follows: "the storm water conveyance system does not directly discharge to a natural stream or unlined channel or channel segment scheduled for restoration".

Waiver (Page 13 of 17)

We concur with the three recognized situations of impracticability. However, it should be also recognized that the list can not be limited to these three only because there may be numerous other very reasonable justifications that may arise in the future, for example, when public safety or human health is at risk. The last two sentences of the first paragraph create a cumbersome process of requesting approval from RWQCB Executive Officer every time such a situation arises. We recommend that the sentences be deleted and replaced with the following: "Any other justification for impracticability may be granted for cause by the municipality. All waivers granted by municipality will be reported to the Executive Officer of the LARWQCB on an annual basis.

Local governments must retain the sole authority to establish mitigation fees or fees of any kind. It is inappropriate for the RWQCB to mandate that municipalities implement fee programs. There are several issues which must be considered by local governments in establishing fee programs. It is therefore requested that the last paragraph of this section be revised as follows: replace "must" with "may"; replace "storm water mitigation" with "municipal".

Alternative Certification for Stormwater Treatment Mitigation (Page 13 of 17)

We agree with the concept of this section of the SUSMP, however, we recommend that the certification be required to be signed by a Civil Engineer or Architect registered in the State of California. This would provide assurance that the design of the BMPs was conducted with technical expertise and also an opportunity for recourse for negligent designs.

Other Issues

Establishing BMP monitoring requirements through property deeds or similar mechanisms is unworkable and should not be included in the SUSMP.

R0069088

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STORMWATER MANAGEMENT DIVISION
650 S. SPRING STREET, SUITE 700
LOS ANGELES, CA 90014
FAX: (213) 847-5443

December 30, 1999

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

CONSIDERATION OF STANDARD URBAN STORM WATER MITIGATION PLAN

I am writing in response to your Notice of Public Hearing for Consideration of the Standard Urban Stormwater Mitigation Plan (SUSMP) on January 26, 2000. The Notice stated that the comments on the SUSMP are due by January 14, 2000 and that the pertinent documents are available for inspection at the Regional Board office. However, my staff contacted Dr. Xavier Swamikannu of your office on December 28, 1999 regarding the documents and was told that the final SUSMP Record of Decision would not be available until January 14, 2000. Without this document available for review, it will not be possible to make comments that are thorough and meaningful by the above mentioned deadline.

I am requesting that your office make these documents available as soon as possible, and that the hearing schedule be adjusted accordingly to provide at least four weeks review period. Thank you for your consideration in this matter. Should you have any questions, please call Mr. Gary Moore at (213) 847-6346.

Sincerely,

James F. Langley for

Judith A. Wilson, Director
Bureau of Sanitation

GLM:MFS:WKT

c: Barb Garrett, CLA
Chris Westhoff, City Attorney
James Langley, Assistant Director, BOS
Gary Moore, BOS
Morad Sedrak, BOS
Wing Tam, BOS

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STORMWATER MANAGEMENT DIVISION
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June 17, 1999

Harry W. Stone, Director
Department of Public Works
County of Los Angeles
P. O. Box 1460
Alhambra. CA 91802-1460

Attn.: Terri M. Grant
Supervising Civil Engineer III
Environmental Programs Division

Dear Mr. Stone:

COMMENTS ON DRAFT STANDARD URBAN STORMWATER MITIGATION PLANS

The City appreciates the opportunity to review and comment on the proposed draft Model Standard Urban Stormwater Mitigation Plans (SUSMPs).

The City is concerned that the draft Model SUSMPs appear to be inconsistent with the requirements of the Development Planning Model Program (Model) and the Municipal Stormwater Permit. This inconsistency will create implementation difficulties for all Permittees and needs to be corrected.

The draft Model SUSMPs do not delineate the anticipated pollutants of concern associated with each development category. Evaluation of potential significant impacts associated with each land-use type would better assist Permittees in understanding the pollutants of most concern associated with each land-use category and in selecting the most appropriate Best Management Practices (BMPs). Therefore. the City requests that the draft Model SUSMPs be modified to include information regarding the specific pollutants of concern associated with each of the seven identified land-use categories.

The benefits of pollution prevention and minimization activities and policies are not addressed in the draft Model SUSMPs or provided as an incentive or option to structural considerations. In several cases pollution prevention and minimization activities could have a much more significant benefit to stormwater quality. and overall environmental quality, than any structural BMPs. The City recommends that the Model SUSMPs include appropriate source-control BMPs.

The City understands the time constraints facing all Permittees as well as the County's deadline for

AN EQUAL EMPLOYMENT OPPORTUNITY - AFFIRMATIVE ACTION EMPLOYER

completing the Model SUSMPs by July 30, 1999. However, we feel the Model SUSMPs is an essential element of achieving stormwater pollution prevention. We request an opportunity to review and provide comments on the revised Model SUSMPs prior to finalization and submittal to the Executive Officer of Los Angeles Regional Water Quality Control Board. We are available to meet with you at your convenience.

Attached, please find the detailed comments on specific BMPs and SUSMPs for your consideration. If you have any questions, please call me or Wing Tam at (213) 847-8346 or (213) 847-5225, respectively.

Sincerely,

Gary Lee Moore, P.E.
Program Manager
Stormwater Management Program

GLM/MS/WKT:bg
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Attachment

cc: Barb Garrett, CLA
Maribel Marin, BPW
Judith Wilson, BOS
Frank Eberhard, CP
Lillian Kawasaki, EAD
Chris Westhoff, City Attorney
Jim Langley, BOS
Morad Sedrak, BOS
Wing Tam, BOS
Shobuz Ikbal, BOS

ATTACHMENT

CITY OF LOS ANGELES COMMENTS ON LOS ANGELES COUNTY MODEL STANDARD URBAN STORMWATER MITIGATION PLANS

SUSMPs Requirements for all "Priority Projects"

The draft Model SUSMPs and the transmitting cover letter imply that all projects which fall into the seven development categories listed in Permit Section III.A.1.c are Priority Projects and therefore require SUSMPs. The Permit defines Priority Projects as projects that have been determined to have a potential significant impact on water quality by the Building Official. The City anticipates reviewing all discretionary projects, not just those listed in Permit Section III.A.1.c. for potentially significant water quality impacts, consistent with the California Environmental Quality Act. We are unaware at this point of any water quality information that indicates that all seven development categories included in Permit Section III.A.1.c. regardless of size, previous land use, ecological sensitivity of adjacent or downstream areas, or elements included in proposed project plans, would result in a potentially significant impacts on water quality. Furthermore, depending upon those and other factors, impacts that may be identified are anticipated to vary from project to project even if they are within the same development category. Therefore, it is important that each Permittee have the ability to review discretionary projects and to mitigate significant impacts via SUSMPs.

The draft Model SUSMPs "Background" section needs to be modified to include clarifying language that preserves and reflects the discretion provided to each Permittee in determining if SUSMPs are required for Priority Projects that do not identify significant water quality impacts. The language which indicates that the SUSMPs "must be incorporated into design plans" for all development projects identified in Permit Section III.A.1.c is inconsistent with the requirements of the Permit and needs to be deleted.

Definition of New Improvement and Redevelopment

While the City agrees it is appropriate to consider redevelopment projects in the application of SUSMPs, we suggest that only those discretionary redevelopment projects with significant stormwater quality impacts be subject to stormwater control measures.

Absence of Source-control BMPs

The benefits of pollution prevention and minimization activities and policies are not addressed in the draft SUSMPs or provided as an incentive or option to structural considerations. In several cases, pollution prevention and minimization activities could have a much more significant benefit to stormwater quality and overall environmental quality, than any structural BMP. The City recommends that the Model SUSMPs include appropriate source-control BMPs.

Proposed Run-Off Reduction Requirement

The 0.6-inch rainfall reduction requirement does not demonstrate a clear nexus as to its appropriateness for all land-use types from a stormwater pollution standpoint. The City requests that the 0.6-inches of rainfall be deleted and replaced with the requirement of the Permit: "minimize, to the maximum extend practicable, the amount of stormwater directed to impermeable areas."

From an equitable standpoint, there is a need to regulate like sources equally. Requiring restaurants to reduce run-off by 0.6-inches of rainfall, while not requiring dry-cleaners, industrial facilities, public facilities, hotels, etc. to do the same appears to be arbitrary and capricious. In addition, some existing developments may have a high percentage of permeable surface, and rather than being rewarded for this progressive development planning, upon any redevelopment they will be penalized by being further required to reduce run-off, despite their previous efforts. The run-off reduction requirement would have significant impacts for those individuals proposing to develop open lots, and could ultimately impact redevelopment efforts. The City requests that the County respond to the legal "taking" issues associated with the proposed run-off reduction requirement and investigate the potential impacts of the requirement on redevelopment programs. In addition, an environmental evaluation addressing potential pollution transfer from one media to another associated with such a requirement should be undertaken.

Comments on Specific SUSMP/BMP

Reducing Post-Development Runoff: Selection of the treatment control BMPs is to be made by considering the characteristics of the land uses first. Several of the selected BMPs are not appropriate for some of the land-use categories. For example, none of the infiltration type BMPs, e.g. Permeable Pavements, Vegetated Swale, Vegetated Strips, Extended Detention Basin, etc., are to be included in the commercial facilities such as Auto Shop or Retail Gasoline Outlet because spilled hazardous material from these facilities may infiltrate ground with stormwater runoff. These and other infiltration type BMPs should be limited to non-commercial land uses where probability of contamination from spilled pollutants is low.

In addition, from an equitable standpoint, BMP requirements should be tailored to the degree of pollution potential within same category of projects based on their size or level of activities. For example, an Auto Shop that has facilities to repair 5 cars a day clearly do not contribute as much pollutant as the one that repairs 20 cars a day. For further information, please see Appendix D of the Model.

Protect Slopes and Channels: Flexibility in application of different slope stabilization and erosion control measures should be at the discretion of the Permittees, because majority of the Permittees have such requirements adopted in their building codes. Allowing Permittees to tailor their SUSMP requirements so that the BMPs do not conflict with building codes will facilitate implementation of the program.

Single Family Hillside Residence: The given definition of "hillside" significantly alters the meaning as intended in the Development Planning Model Program. This definition should be revised to conform to the Development Planning Model Program.

Properly Design Equipment/Accessory Wash Area: The second bullet doesn't state how the wash water and storm runoff is to be conveyed from the wash area. Requirements for proper connection to sanitary sewer with rain water diversion system should be added.

Properly Design Common Trash Storage Areas: (I) This requirement should only be applicable to outdoor storage of materials that have a potential to pollute stormwater. Outdoor storage of inert material would not have a significant impact on stormwater quality. (ii) The definition given for the "common area" is too broad. It should be narrowed down to include only outdoor material storage area.

Property Design Repair/Maintenance Bays: (I) First bullet should be revised as follows: "Repair/maintenance bays must be indoors or designed in such a way that doesn't allow contact with stormwater and stormwater run-on. (ii) The last sentence of the second bullet should be revised to include the statement that "Industrial Waste Discharge Permit will be required if discharge to sanitary sewer is necessary".

Properly Design Vehicle/Equipment Wash Areas: Include the requirement that wash area must prevent stormwater run-on from the surrounding area with berms or grade break or must have a rain water diversion system.

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September 2, 1999

Dennis Dickerson, Executive Officer
Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPS)

The City of Los Angeles (City) would like to thank you for the opportunity to review and comment on the Standard Urban Storm Water Mitigation Plans (SUSMPs) submitted to you for approval and being brought before the Board for their consideration. After reviewing the SUSMPs, the City is concerned the proposed measures inappropriately constrains the City's discretion to approve land development projects and impose appropriate mitigation measures based on City and community requirements and needs, and site specific conditions.

Attached is an edited copy of a SUSMP for the 100+ home subdivision land use category illustrating the City's proposed modifications to be made to all the SUSMPs that would adequately address the following City comments and concerns.

1. **The City advocates implementing reasonable land development control measures that will protect water quality and beneficial uses by evaluating environmental impacts based on site specific conditions for a land development project. The wording provided in the SUSMPs should be revised to ensure selection of BMPs for a site are**:

- Implemented through the environmental impact review (CEQA) process for land development (Permit, Part 2, III.A.1),
- Implemented based on threat to water quality and protection of beneficial uses (Permit, Finding 27),
- Implemented based on site specific conditions (Permit Finding No. 30 and 55Fed. Reg. 48001 (Nov. 16, 1990),
- Justified and feasible both economically and technically, and
- Acceptable to the community.

R0069095

Discussion
Based on experience of other municipalities throughout California, including information provided by Alameda County at the August 10, 1999 workshop held by your staff, treatment BMPs appear to typically be selected for a site based on a list of recommended BMPs without technical or scientific justification. Selecting treatment BMPs should be based on evaluating its treatment efficiency and capability based on site-specific conditions and characteristics, pollutants of concern identified for the proposed land use, and consideration of other source control BMPs being required for a site. Treatment BMPs require a community to incur costs for installation, operation and maintenance. Requiring such expenditures of a community should be justified and result in real environmental benefits. The approach recommended by the City simply ensures the goal of the storm water program and selection of site appropriate BMPs remains focussed on the environment and improving water quality.

The BMPs proposed in the SUSMPs are BMPs that have been used for a number of years in storm water programs across the country. The City is not certain that the BMPs provided in the SUSMPs are appropriate for all projects given the number of site-specific conditions involved in a land development project. Reports of the effectiveness of these BMPs to remove pollutants in stormwater vary considerably, and studies to evaluate the design requirements, removal efficiencies, use and maintenance of these BMPs are still being conducted today. In addition, new technologies continue to be developed. Due to the limited knowledge of storm water treatment capabilities, BMP selection is typically based on best professional judgement that must be left to the discretion of the local agency, at this time.

The City cannot emphasize enough the importance of ensuring the Regional Board or executive officer approve guidance that maintains a focus of establishing treatment requirements based on the local agency evaluation of site characteristics and land use patterns to establish the threat to water quality.

2. **Instead of being labeled "Requirements", BMPs contained in the SUSMPs should be set forth as guidance for Permittees to reference and consider during the selection of mitigation measures during the land development approval process.**

Discussion
Using the SUSMPs as guidance allows flexibility for the City to establish conditions based on actual threats to water quality and protection of beneficial uses, and site specific conditions for each proposed land development project. This flexibility ensures the City's continued authority to control land use policies. Further, State and Federal law, the federal stormwater regulations, and the Permit support the City's understanding:

Laws and Regulations
The Porter-Cologne Water Quality Control Act Section at 13360(a)) states, "*No waste discharge requirement or other order of a regional board or the state board or decree of a court issued under this division shall specify the design, location, type of construction, or particular manner in which compliance may be had with that requirement, order, or decree,*

and the person so ordered shall be permitted to comply with the order in any lawful manner..." This statutory language allows the City to select the actual methods it plans to use for controlling discharges to the maximum extent practicable (MEP). The MEP standard, which incorporates a consideration of technology, cost, competing environmental mandates, and other societal concerns, was intended to allow local governments the opportunity to weigh competing concerns and to involve the public in defining the policies, standards, and expenditures undertaken to implement an effective storm water management program. *See* Clean Water Act, 33 U.S.C. §402(p)(3)(iii); *see also* 55 Fed. Reg. 48037-38 at section 3 (Nov.16, 1990). Furthermore, the federal storm water regulations allow for a great deal of flexibility and variability in municipal storm water programs. *See* Preamble to EPA storm water regulations, 55 Fed. Reg. 48038 (Nov. 16, 1990); *see also* Id. at *48001* ("EPA notes that *each municipal program will be tailored to the conditions in that city.* Differences in regional weather patterns, hydrology, water quality standards, and storm sewer systems themselves dictate that storm water management practices will vary to some degree in each municipality.")(italics added).

Permit

Section 2.III.A.1 of the Permit specifies that the Permittees develop guidance to be used when evaluating and permitting priority and exempt projects. The section then goes on to state the types of Best Management Practices (BMPs) that must be included in the guidance documents. The Permit does not specify which BMPs are mandated for each of the enumerated development projects. Rather, the Permit states the types of projects for which SUSMPs must be prepared and states that the SUSMPs must incorporate the appropriate elements of the recommended BMPs. None of this Permit language requires particular BMPs for particular development projects. Therefore, the mandatory language of the SUSMPs should not go beyond the requirements of the Permit to require that certain BMPs be imposed on each of the specified development projects.

For example, the SUSMP for the 100+ Home Subdivision states: "This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects." All such mandatory language contained in the SUSMPs (as underlined in the sentence above) should be modified to reflect the flexibility possessed by the local government Permittees to "implement, to the maximum extent practicable, requirements established by appropriate governmental agencies under CEQA, . . ., local ordinances, and other legal authorities. . ." *See* Permit section 2.III.A.2.a. To be consistent with the intent of the permit, the above cited sentence from the SUSMP should be modified to read: "This SUSMP outlines the recommended Best Management Practices (BMPs) which may be incorporated into design plans for 100+ Home Subdivision projects." All other mandatory language contained in these guidance documents should be similarly modified (see attached edited SUSMP).

The City currently implements new development BMPs by following the CEQA guidelines, and will continue this approach once the SUSMPs are approved. By using this approach, any mitigation measures, determined by the City to be appropriate and necessary after public

input, would be based on site-specific conditions. Through its stormwater program, the City will evaluate the effectiveness of this approach, and will revise it, if needed, should the assessment determine it to be ineffective.

The City believes any attempt by the RWQCB to *mandate* that the City impose any or all mitigation measures on development projects conflicts with Finding No. 39 of the City's Municipal Stormwater Permit, Order No. 96-054 (NPDES CAS614001) which states, "Permittees are responsible for considering potential storm water impacts when making planning decisions. However, neither this order nor any of its requirements are intended to restrict or control local land use decision-making authority." (emphasis added).

3. **The language contained in the background section for each SUSMP is confusing and appears to imply the BMPs are requirements for the seven categories of land development projects. The proposed SUSMP language is not supported by the Permit and should be revised to ensure the City may determine if a project is discretionary through its planning and CEQA procedures:**

Discussion
Section 2.III.A.2. of the Permit specifies that Permittees are to develop planning control measures for priority projects, which are those projects (a) requiring discretionary approval, and (b) where the City has determined that the project may have a potential significant effect on storm water quality. The SUSMPs appear to make all projects within the seven development categories enumerated in section 2.III.A.1.c.i.-vii. into *de facto* priority projects even where the requisite determination has not been made by each individual Permittee that these projects may have a potentially significant effect on storm water quality, and even for projects not requiring discretionary approval. This action nullifies the existence of any exempt projects and makes the definitions of priority and exempt projects contained in section 2.III.A.1.a.ii. superfluous. Such a construction of the permit language could not have been intended. Therefore, the SUSMPs should be revised to clarify the BMPs contained therein are for the use of the Permittees in adopting municipal codes and ordinances to regulate storm water discharges from development projects determined to be "priority projects."

4. **The City opposes establishing numeric mitigation measure requirements for BMP design criteria based on the current state of science. Determining design criteria should remain a local agency responsibility, which is established during the land development process, based on site specific conditions and water quality consideration, and not a requirement established by the Board.**

Discussion
The City is concerned about a growing trend in the design practice of stormwater treatment control measures to capture a certain percentage of annual runoff. These design practices are being done based on regulatory agency recommendations without consideration or evaluation of the resultant environmental benefit or protection of water quality based on

pollutant concentrations or loading for storm water runoff. This practice, by default, defines MEP.

Establishing a numeric requirement is equivalent to establishing an effluent guideline by USEPA. Such a process requires the limit to be technically and economically justifiable, based on adequate and appropriate data, and subject to public review and comment. USEPA recently began the process to establish effluent guidelines for storm water runoff from construction activities. These guidelines will address runoff from post-construction, which is commonly referred to as New Development. It is pre-mature for the Los Angeles region to move forward with numeric design criteria without adequate technical and economic information to ensure informed decision making. Such action becomes more problematic when the information necessary for such decision-making activity is in the process of being developed and publicly reviewed. The Regional Board and other stakeholders should be actively participating in the USEPA process to ensure that the needs of this region are met through that rulemaking, rather than establish duplicative and potentially conflicting local regulations.

5. **The City does not oppose the inclusion of treatment BMPs in the SUSMPs for automotive repair, retail gasoline, restaurants and hillside development land development categories so long as such BMPs are recommendations for storm water mitigation measures (and not requirements) to be considered by a Permittee based on site specific conditions and water quality considerations during the CEQA process.**

Discussion:
To ensure the City's stormwater program remains based on the protection of water quality and beneficial uses, the City needs to evaluate all possible BMPs, including treatment measures if needed, for all land development projects. To eliminate the consideration of treatment controls for certain types of land uses is arbitrary. The City does not object to including land-use appropriate treatment controls as recommendations. However, the City again emphasizes the selection of treatment BMPs must be left to the discretion of the City and not required by the SUSMP. However, if there is information or evidence that certain treatment BMPs are inappropriate for some facilities, such as infiltration devices at retail gas stations, they should not be included as a recommended BMP for that specific land use SUSMP. The City recommends a preliminary evaluation be conducted before specific treatment BMPs are listed for certain land use categories.

6. **Expand the list of recommended BMPs to include source control BMPs that are appropriate for each land-use category SUSMP.**

Discussion:
Early drafts of the SUSMPs included land-use appropriate source control BMPs that were removed from the final SUSMP submitted for approval. The City believes removing source control BMPs is inappropriate and limits the City's authority to approve new development projects. The City and development community should be able consider all possible

alternatives to mitigate impacts to stormwater caused by runoff from a proposed development. Excluding source control BMPs eliminates the ability to consider all possible mitigation alternatives; such as implementing source control BMPs only, or implementing treatment and source control BMPs combined, or implementing treatment BMPs only. The City recommends the SUSMPs be revised to include appropriate source control BMPs.

7. **On all SUSMPs:**

- **Eliminate the word "REQUIREMENTS" in the third section of the SUSMP on page 3, and replace with "RECOMMENDED BMPs AND MITIGATION MEASURES TO MINIMIZE STORMWATER IMPACTS TO WATER QUALITY TO THE MEP" and combine items listed 1 through 7 together under the new title.**
- **Revise the discussion on proof of BMP maintenance in the current Section 8 to remove the specificity of how proof of maintenance is to be obtained and simply refer to the need of a Permittee to ensure maintenance through its own legal authorities.**

Discussion

The Permit recommends the Permittees consider, not require, BMPs addressing peak storm water runoff rates (Item 1 of the SUSMP) and conservation of natural areas (Item 2 of the SUSMP) during its planning stages (Part 2, III.A.1.b and Part 2, III.A.3.a). While the City strongly agrees these are important issues to be considered, selection of these types of BMPs should again be based on site specific conditions and water quality considerations at the discretion of the local agency. Therefore, the City recommends these two possible mitigation measures be included under the list of recommended BMPs, as opposed to being identified separately as "requirements".

As discussed in previous comments and concerns, the City believes all BMPs listed in the SUSMPs should be recommendations to be considered by the local agency and not requirements. The City strongly recommends the word "Requirements" be removed from the SUSMP and replaced with "Recommended" or other appropriate more applicable language.

The City agrees that proper maintenance of a treatment BMP is essential for continued environmental benefits realized through its operation. However, establishing how a Permittee will require proof of maintenance should be at the discretion of the local agency and implemented through its own legal authority. The current wording in the SUSMP is too specific and restricts local agency discretion in establishing land development requirements in its community. In addition, it is anticipated that the administrative costs associated with the complex SUSMPs documentation requirements would not be justified by the benefit achieved. The City most certainly believes that there are more efficient methods of achieving the desired goal.

Again the City appreciates the opportunity to comment on the SUSMPS and requests these comments to be incorporated into the SUSMPs and the revised SUSMPs be circulated again for comment by the Permittees.

We look forward to working with Board staff to make this a program that can have a demonstrable effect on storm water quality. Please contact Gary Lee Moore at (213) 847-6346 if you have any questions related to our comments.

Sincerely,

Judith Wilson

Judith Wilson, Director
Bureau of Sanitation

JAW/GLM/MFS:ema
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Attachment

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives for the municipal storm water program are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from municipal separate storm sewer systems to the Maximum Extent Practicable.

The Permit requires land development projects identified as priority projects to develop and implement an approved Urban Storm Water Mitigation Plan. Priority projects are defined in the Permit as development and redevelopment projects requiring discretionary approval which the Building Official (or equivalent municipal authority) determines may have a potential significant effect on storm water quality. Determining if a project is discretionary will be done through implementing requirements established in the California Environmental Quality Act (CEQA). The Permit further requires the development of Standard Urban Storm Water Mitigation Plans for ~~This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the~~ seven categories of land use: 10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurants ~~will need to implement the appropriate SUSMP requirements into their project plans~~. This SUSMP outlines the ~~necessary~~ recommended Best Management Practices (BMPs) ~~which must be incorporated into~~ to be considered in design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new ~~guidelines~~ guidance and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

~~REQUIREMENTS~~

~~1. PEAK STORM WATER RUNOFF DISCHARGE RATES~~

Comment: Remove item numbering and move this entire section to be included under the list of example BMPs

~~2.0 CONSERVE NATURAL AREAS~~

Comment: Remove item numbering and move this entire section to be included under the list of example BMPs

~~3.0 MINIMIZE STORMWATER POLLUTANTS OF CONCERN~~
1.0 RECOMMENDED BMPs and MITIGATION MEASURES TO MINIMIZE STORMWATER IMPACTS TO WATER QUALITY TO THE MEP

Comment: Renumber to Item No. 1 and rename.

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. Determining pollutants of concern associated with a land development project will be identified based on site-specific conditions and local water quality considerations by the local agency.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. ~~Those BMPs best suited for that purpose are, at a minimum, those listed in~~ To assist in determining the appropriate BMP, the California Storm Water Best Management Practices Handbooks may be used as a reference. The handbooks provide fact sheets that characterize the targeted pollutants for specific type of BMPs. ~~as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.~~ Many of the BMPs recommended in this SUSMP are contained in the Handbook.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Where increased storm water discharge rates will ~~Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an~~ increase~~d peak storm water discharge rate may result in an increased~~ potential for downstream erosion. implement appropriate structural BMPs, such as swales, basins or trenches, listed below or other acceptable hydraulic engineered practices to limit the post-development peak storm water runoff discharge rates to pre-development levels.

- Consistent with applicable General Plan and Local Area Plan policies, land development projects should consider into its site design, where applicable:~~If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:~~

  - ~~Every effort shall be made to C~~oncentratinge or clustering development on portions of a site while leaving the remaining land in a natural undisturbed condition.

  - Limiting clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

  - Maximizinge trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.

  - Preservinge riparian areas and wetlands.

- Consider ~~Provide~~ reducinged sidewalk widths ~~sidewalks~~ and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Consider designing residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- ~~Comply with all zoning and applicable ordinances to~~ minimizing the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Consider using ~~Use~~ permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Consider using ~~Use~~ open space development that incorporates smaller lot sizes.

- Consider using Reduced building density.

- ~~Comply with all zoning and applicable ordinances to~~ Consider reducing ~~reduce~~ overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- ~~Comply with all zoning and applicable ordinances to~~ Consider reducing ~~reduce~~ the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Consider directing ~~Direct~~ rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Consider Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Constructed wetlands (Applicability and design criteria to be determined by the

local jurisdiction)

- Consider Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Media filtration (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Cisterns (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

~~2. PROTECT SLOPES AND CHANNELS~~

Comment: Include this item under the list of example BMPs

- ~~If applicable, the project plans must include BMPs~~ Consistent with erosion and sediment control local code and ordinances land development design should consider:~~to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff~~:

  - Conveying runoff ~~safely~~ from the tops of slopes and stabilize disturbed slopes at velocities less than the velocity determined to cause erosion for a given slope and soil conditions.

  - Stabilizing permanent channel crossings.

- Vegetating slopes with native or drought tolerant vegetation.

- Installing energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

~~**3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE**~~

Comment: Remove item numbering and include this item under the list of example BMPs

- Consider stencilling storm drains or posting signs that ~~stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil~~ contain a brief statement ~~that~~ prohibiting the dumping of improper materials into the stormwater conveyance system. ~~Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.~~

  ~~- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING — DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.~~

  ~~- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.~~

  - ~~Legibility of stencils and signs must be maintained.~~

~~**6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS**~~

Comment: Remove item numbering and include this item under the list of example BMPs

~~Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.~~

~~Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system.~~

- Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are ~~required~~ recommended:

  - Areas where materials are to be stored ~~must~~ should be: (1) placed in an enclosure such as,

but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area ~~must~~ should be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

~~**7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS**~~

Comment: Remove item numbering and include this item under the list of example BMPs

~~A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.~~

~~Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks.~~

- All common trash container areas ~~must meet the~~ should consider the following ~~requirements~~:

  - Trash container areas ~~must~~ should have drainage from adjoining roofs and pavement diverted around the area(s).

  - Trash container areas ~~must~~ should be screened or walled to prevent off-site transport of trash.

2 ~~8.~~ ~~PROVIDE PROOF OF ONGOING BMP~~ MAINTENANCE OF TREATMENT BMP

Comment: Renumber to item number 2, and revise to allow local agency discretion on implementation and enforcement of BMP maintenance requirements.

Improper maintenance is one of the most common reasons for ~~water quality controls~~ treatment controls to not function as designed or to fail entirely. It is important that ~~consider who will be responsible for~~ maintenance requirements for a permanent BMP be identified by local agency staff ~~, and what equipment is required to perform the maintenance properly. As part of~~ during the project approval process, and addressed appropriately in accordance with local agency policy and authorities. ~~review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.~~ Requiring and enforcing maintenance requirements will

be implemented through local agency legal authorities.

~~For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.~~

~~If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.~~

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

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September 2, 1999

Dennis Dickerson, Executive Officer
Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPS)

The City of Los Angeles (City) would like to thank you for the opportunity to review and comment on the Standard Urban Storm Water Mitigation Plans (SUSMPs) submitted to you for approval and being brought before the Board for their consideration. After reviewing the SUSMPs, the City is concerned the proposed measures inappropriately constrains the City's discretion to approve land development projects and impose appropriate mitigation measures based on City and community requirements and needs, and site specific conditions.

Attached is an edited copy of a SUSMP for the 100+ home subdivision land use category illustrating the City's proposed modifications to be made to all the SUSMPs that would adequately address the following City comments and concerns.

1. **The City advocates implementing reasonable land development control measures that will protect water quality and beneficial uses by evaluating environmental impacts based on site specific conditions for a land development project. The wording provided in the SUSMPs should be revised to ensure selection of BMPs for a site are:**

- Implemented through the environmental impact review (CEQA) process for land development (Permit, Part 2, III.A.1),
- Implemented based on threat to water quality and protection of beneficial uses (Permit, Finding 27),
- Implemented based on site specific conditions (Permit Finding No. 30 and 55Fed. Reg. 48001 (Nov. 16, 1990),
- Justified and feasible both economically and technically, and
- Acceptable to the community.

R0069112

Discussion
Based on experience of other municipalities throughout California, including information provided by Alameda County at the August 10, 1999 workshop held by your staff, treatment BMPs appear to typically be selected for a site based on a list of recommended BMPs without technical or scientific justification. Selecting treatment BMPs should be based on evaluating its treatment efficiency and capability based on site-specific conditions and characteristics, pollutants of concern identified for the proposed land use, and consideration of other source control BMPs being required for a site. Treatment BMPs require a community to incur costs for installation, operation and maintenance. Requiring such expenditures of a community should be justified and result in real environmental benefits. The approach recommended by the City simply ensures the goal of the storm water program and selection of site appropriate BMPs remains focussed on the environment and improving water quality.

The BMPs proposed in the SUSMPs are BMPs that have been used for a number of years in storm water programs across the country. The City is not certain that the BMPs provided in the SUSMPs are appropriate for all projects given the number of site-specific conditions involved in a land development project. Reports of the effectiveness of these BMPs to remove pollutants in stormwater vary considerably, and studies to evaluate the design requirements, removal efficiencies, use and maintenance of these BMPs are still being conducted today. In addition, new technologies continue to be developed. Due to the limited knowledge of storm water treatment capabilities, BMP selection is typically based on best professional judgement that must be left to the discretion of the local agency, at this time.

The City cannot emphasize enough the importance of ensuring the Regional Board or executive officer approve guidance that maintains a focus of establishing treatment requirements based on the local agency evaluation of site characteristics and land use patterns to establish the threat to water quality.

2. **Instead of being labeled "Requirements", BMPs contained in the SUSMPs should be set forth as guidance for Permittees to reference and consider during the selection of mitigation measures during the land development approval process.**

Discussion
Using the SUSMPs as guidance allows flexibility for the City to establish conditions based on actual threats to water quality and protection of beneficial uses, and site specific conditions for each proposed land development project. This flexibility ensures the City's continued authority to control land use policies. Further, State and Federal law, the federal stormwater regulations, and the Permit support the City's understanding:

Laws and Regulations
The Porter-Cologne Water Quality Control Act Section at 13360(a)) states, "*No waste discharge requirement or other order of a regional board or the state board or decree of a court issued under this division shall specify the design, location, type of construction, or particular manner in which compliance may be had with that requirement, order, or decree,*

and the person so ordered shall be permitted to comply with the order in any lawful manner..." This statutory language allows the City to select the actual methods it plans to use for controlling discharges to the maximum extent practicable (MEP). The MEP standard, which incorporates a consideration of technology, cost, competing environmental mandates, and other societal concerns, was intended to allow local governments the opportunity to weigh competing concerns and to involve the public in defining the policies, standards, and expenditures undertaken to implement an effective storm water management program. *See* Clean Water Act, 33 U.S.C. §402(p)(3)(iii); *see also* 55 Fed. Reg. 48037-38 at section 3 (Nov.16, 1990). Furthermore, the federal storm water regulations allow for a great deal of flexibility and variability in municipal storm water programs. *See* Preamble to EPA storm water regulations, 55 Fed. Reg. 48038 (Nov. 16, 1990); *see also* Id. at *48001* ("EPA notes that *each municipal program will be tailored to the conditions in that city.* Differences in regional weather patterns, hydrology, water quality standards, and storm sewer systems themselves dictate that storm water management practices will vary to some degree in each municipality.")(italics added).

Permit

Section 2.III.A.1 of the Permit specifies that the Permittees develop guidance to be used when evaluating and permitting priority and exempt projects. The section then goes on to state the types of Best Management Practices (BMPs) that must be included in the guidance documents. The Permit does not specify which BMPs are mandated for each of the enumerated development projects. Rather, the Permit states the types of projects for which SUSMPs must be prepared and states that the SUSMPs must incorporate the appropriate elements of the recommended BMPs. None of this Permit language requires particular BMPs for particular development projects. Therefore, the mandatory language of the SUSMPs should not go beyond the requirements of the Permit to require that certain BMPs be imposed on each of the specified development projects.

For example, the SUSMP for the 100+ Home Subdivision states: "This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects." All such mandatory language contained in the SUSMPs (as underlined in the sentence above) should be modified to reflect the flexibility possessed by the local government Permittees to "implement, to the maximum extent practicable, requirements established by appropriate governmental agencies under CEQA, . . ., local ordinances, and other legal authorities. . ." *See* Permit section 2.III.A.2.a. To be consistent with the intent of the permit, the above cited sentence from the SUSMP should be modified to read: "This SUSMP outlines the recommended Best Management Practices (BMPs) which may be incorporated into design plans for 100+ Home Subdivision projects." All other mandatory language contained in these guidance documents should be similarly modified (see attached edited SUSMP).

The City currently implements new development BMPs by following the CEQA guidelines, and will continue this approach once the SUSMPs are approved. By using this approach, any mitigation measures, determined by the City to be appropriate and necessary after public

input, would be based on site-specific conditions. Through its stormwater program, the City will evaluate the effectiveness of this approach, and will revise it, if needed, should the assessment determine it to be ineffective.

The City believes any attempt by the RWQCB to *mandate* that the City impose any or all mitigation measures on development projects conflicts with Finding No. 39 of the City's Municipal Stormwater Permit, Order No. 96-054 (NPDES CAS614001) which states, "Permittees are responsible for considering potential storm water impacts when making planning decisions. However, neither this order nor any of its requirements are intended to restrict or control local land use decision-making authority." (emphasis added).

3. **The language contained in the background section for each SUSMP is confusing and appears to imply the BMPs are requirements for the seven categories of land development projects. The proposed SUSMP language is not supported by the Permit and should be revised to ensure the City may determine if a project is discretionary through its planning and CEQA procedures:**

Discussion
Section 2.III.A.2. of the Permit specifies that Permittees are to develop planning control measures for priority projects, which are those projects (a) requiring discretionary approval, and (b) where the City has determined that the project may have a potential significant effect on storm water quality. The SUSMPs appear to make all projects within the seven development categories enumerated in section 2.III.A.1.c.i.-vii. into *de facto* priority projects even where the requisite determination has not been made by each individual Permittee that these projects may have a potentially significant effect on storm water quality, and even for projects not requiring discretionary approval. This action nullifies the existence of any exempt projects and makes the definitions of priority and exempt projects contained in section 2.III.A.1.a.ii. superfluous. Such a construction of the permit language could not have been intended. Therefore, the SUSMPs should be revised to clarify the BMPs contained therein are for the use of the Permittees in adopting municipal codes and ordinances to regulate storm water discharges from development projects determined to be "priority projects."

4. **The City opposes establishing numeric mitigation measure requirements for BMP design criteria based on the current state of science. Determining design criteria should remain a local agency responsibility, which is established during the land development process, based on site specific conditions and water quality consideration, and not a requirement established by the Board.**

Discussion
The City is concerned about a growing trend in the design practice of stormwater treatment control measures to capture a certain percentage of annual runoff. These design practices are being done based on regulatory agency recommendations without consideration or evaluation of the resultant environmental benefit or protection of water quality based on

pollutant concentrations or loading for storm water runoff. This practice, by default, defines MEP.

Establishing a numeric requirement is equivalent to establishing an effluent guideline by USEPA. Such a process requires the limit to be technically and economically justifiable, based on adequate and appropriate data, and subject to public review and comment. USEPA recently began the process to establish effluent guidelines for storm water runoff from construction activities. These guidelines will address runoff from post-construction, which is commonly referred to as New Development. It is pre-mature for the Los Angeles region to move forward with numeric design criteria without adequate technical and economic information to ensure informed decision making. Such action becomes more problematic when the information necessary for such decision-making activity is in the process of being developed and publicly reviewed. The Regional Board and other stakeholders should be actively participating in the USEPA process to ensure that the needs of this region are met through that rulemaking, rather than establish duplicative and potentially conflicting local regulations.

5. **The City does not oppose the inclusion of treatment BMPs in the SUSMPs for automotive repair, retail gasoline, restaurants and hillside development land development categories so long as such BMPs are recommendations for storm water mitigation measures (and not requirements) to be considered by a Permittee based on site specific conditions and water quality considerations during the CEQA process.**

Discussion:
To ensure the City's stormwater program remains based on the protection of water quality and beneficial uses, the City needs to evaluate all possible BMPs, including treatment measures if needed, for all land development projects. To eliminate the consideration of treatment controls for certain types of land uses is arbitrary. The City does not object to including land-use appropriate treatment controls as recommendations. However, the City again emphasizes the selection of treatment BMPs must be left to the discretion of the City and not required by the SUSMP. However, if there is information or evidence that certain treatment BMPs are inappropriate for some facilities, such as infiltration devices at retail gas stations, they should not be included as a recommended BMP for that specific land use SUSMP. The City recommends a preliminary evaluation be conducted before specific treatment BMPs are listed for certain land use categories.

6. **Expand the list of recommended BMPs to include source control BMPs that are appropriate for each land-use category SUSMP.**

Discussion:
Early drafts of the SUSMPs included land-use appropriate source control BMPs that were removed from the final SUSMP submitted for approval. The City believes removing source control BMPs is inappropriate and limits the City's authority to approve new development projects. The City and development community should be able consider all possible

alternatives to mitigate impacts to stormwater caused by runoff from a proposed development. Excluding source control BMPs eliminates the ability to consider all possible mitigation alternatives; such as implementing source control BMPs only, or implementing treatment and source control BMPs combined, or implementing treatment BMPs only. The City recommends the SUSMPs be revised to include appropriate source control BMPs.

7. **On all SUSMPs:**

- **Eliminate the word "REQUIREMENTS" in the third section of the SUSMP on page 3, and replace with "RECOMMENDED BMPs AND MITIGATION MEASURES TO MINIMIZE STORMWATER IMPACTS TO WATER QUALITY TO THE MEP" and combine items listed 1 through 7 together under the new title.**
- **Revise the discussion on proof of BMP maintenance in the current Section 8 to remove the specificity of how proof of maintenance is to be obtained and simply refer to the need of a Permittee to ensure maintenance through its own legal authorities.**

Discussion

The Permit recommends the Permittees consider, not require, BMPs addressing peak storm water runoff rates (Item 1 of the SUSMP) and conservation of natural areas (Item 2 of the SUSMP) during its planning stages (Part 2, III.A.1.b and Part 2, III.A.3.a). While the City strongly agrees these are important issues to be considered, selection of these types of BMPs should again be based on site specific conditions and water quality considerations at the discretion of the local agency. Therefore, the City recommends these two possible mitigation measures be included under the list of recommended BMPs, as opposed to being identified separately as "requirements".

As discussed in previous comments and concerns, the City believes all BMPs listed in the SUSMPs should be recommendations to be considered by the local agency and not requirements. The City strongly recommends the word "Requirements" be removed from the SUSMP and replaced with "Recommended" or other appropriate more applicable language.

The City agrees that proper maintenance of a treatment BMP is essential for continued environmental benefits realized through its operation. However, establishing how a Permittee will require proof of maintenance should be at the discretion of the local agency and implemented through its own legal authority. The current wording in the SUSMP is too specific and restricts local agency discretion in establishing land development requirements in its community. In addition, it is anticipated that the administrative costs associated with the complex SUSMPs documentation requirements would not be justified by the benefit achieved. The City most certainly believes that there are more efficient methods of achieving the desired goal.

Again the City appreciates the opportunity to comment on the SUSMPS and requests these comments to be incorporated into the SUSMPs and the revised SUSMPs be circulated again for comment by the Permittees.

We look forward to working with Board staff to make this a program that can have a demonstrable effect on storm water quality. Please contact Gary Lee Moore at (213) 847-6346 if you have any questions related to our comments.

Sincerely,

Judith Wilson

Judith Wilson, Director
Bureau of Sanitation

JAW/GLM/MFS:ema
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Attachment

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives for the municipal storm water program are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from municipal separate storm sewer systems to the Maximum Extent Practicable.

The Permit requires land development projects identified as priority projects to develop and implement an approved Urban Storm Water Mitigation Plan. Priority projects are defined in the Permit as development and redevelopment projects requiring discretionary approval which the Building Official (or equivalent municipal authority) determines may have a potential significant effect on storm water quality. Determining if a project is discretionary will be done through implementing requirements established in the California Environmental Quality Act (CEQA). The Permit further requires the development of Standard Urban Storm Water Mitigation Plans for ~~This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the~~ seven categories of land use: 10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurants ~~will need to implement the appropriate SUSMP requirements into their project plans~~. This SUSMP outlines the ~~necessary~~ recommended Best Management Practices (BMPs) ~~which must be incorporated into~~ to be considered in design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new ~~guidelines~~ guidance and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

~~**REQUIREMENTS**~~

~~**1. PEAK STORM WATER RUNOFF DISCHARGE RATES**~~

Comment: Remove item numbering and move this entire section to be included under the list of example BMPs

~~**2.0 CONSERVE NATURAL AREAS**~~

Comment: Remove item numbering and move this entire section to be included under the list of example BMPs

~~**3.0 MINIMIZE STORMWATER POLLUTANTS OF CONCERN**~~
1.0 RECOMMENDED BMPs and MITIGATION MEASURES TO MINIMIZE STORMWATER IMPACTS TO WATER QUALITY TO THE MEP

Comment: Renumber to Item No. 1 and rename.

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. Determining pollutants of concern associated with a land development project will be identified based on site-specific conditions and local water quality considerations by the local agency.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. ~~Those BMPs best suited for that purpose are, at a minimum, those listed in~~ To assist in determining the appropriate BMP, the California Storm Water Best Management Practices Handbooks may be used as a reference. The handbooks provide fact sheets that characterize the targeted pollutants for specific type of BMPs. ~~as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.~~ Many of the BMPs recommended in this SUSMP are contained in the Handbook.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Where increased storm water discharge rates will ~~Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an~~ increased ~~peak storm water discharge rate may result in an increased~~ potential for downstream erosion, implement appropriate structural BMPs, such as swales, basins or trenches, listed below or other acceptable hydraulic engineered practices to limit the post-development peak storm water runoff discharge rates to pre-development levels.

- Consistent with applicable General Plan and Local Area Plan policies, land development projects should consider into its site design, where applicable: ~~If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:~~

  - ~~Every effort shall be made to~~ Concentrating or clustering development on portions of a site while leaving the remaining land in a natural undisturbed condition.

  - Limiting clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

  - Maximizing trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.

  - Preserving riparian areas and wetlands.

- Consider ~~Provide~~ reducing ~~d~~ sidewalk widths ~~sidewalks~~ and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Consider designing residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- ~~Comply with all zoning and applicable ordinances to~~ minimizing the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Consider using ~~Use~~ permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Consider using ~~Use~~ open space development that incorporates smaller lot sizes.

- Consider using Reduced building density.

- ~~Comply with all zoning and applicable ordinances to~~ Consider reducing ~~reduce~~ overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- ~~Comply with all zoning and applicable ordinances to~~ Consider reducing ~~reduce~~ the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Consider directing ~~Direct~~ rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Consider Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Constructed wetlands (Applicability and design criteria to be determined by the

local jurisdiction)

- Consider Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Media filtration (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Cisterns (Applicability and design criteria to be determined by the local jurisdiction)

- Consider Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

~~**2. PROTECT SLOPES AND CHANNELS**~~

Comment: Include this item under the list of example BMPs

- ~~If applicable, the project plans must include BMPs~~ Consistent with erosion and sediment control local code and ordinances land development design should consider:~~to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff~~:

  - Conveying runoff ~~safely~~ from the tops of slopes and stabilize disturbed slopes at velocities less than the velocity determined to cause erosion for a given slope and soil conditions.

  - Stabilizing permanent channel crossings.

- Vegetating slopes with native or drought tolerant vegetation.

- Installing energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

~~**3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE**~~

Comment: Remove item numbering and include this item under the list of example BMPs

- Consider stencilling storm drains or posting signs that ~~stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil~~ contain a brief statement ~~that~~ prohibiting the dumping of improper materials into the stormwater conveyance system. ~~Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.~~

  ~~- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.~~

  ~~- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.~~

  - ~~Legibility of stencils and signs must be maintained.~~

~~**6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS**~~

Comment: Remove item numbering and include this item under the list of example BMPs

~~Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.~~

~~Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system.~~

- Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are ~~required~~ recommended:

  - Areas where materials are to be stored ~~must~~ should be: (1) placed in an enclosure such as,

but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area ~~must~~ should be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

~~7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS~~

Comment: Remove item numbering and include this item under the list of example BMPs

~~A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.~~

~~Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks.~~

- All common trash container areas ~~must meet the~~ should consider the following ~~requirements~~:

  - Trash container areas ~~must~~ should have drainage from adjoining roofs and pavement diverted around the area(s).

  - Trash container areas ~~must~~ should be screened or walled to prevent off-site transport of trash.

2 ~~8. PROVIDE PROOF OF ONGOING BMP~~ MAINTENANCE OF TREATMENT BMP

Comment: Renumber to item number 2, and revise to allow local agency discretion on implementation and enforcement of BMP maintenance requirements.

Improper maintenance is one of the most common reasons for ~~water quality controls~~ treatment controls to not function as designed or to fail entirely. It is important that ~~consider who will be responsible for~~ maintenance requirements for a permanent BMP be identified by local agency staff ~~, and what equipment is required to perform the maintenance properly. As part of~~ during the project approval process, and addressed appropriately in accordance with local agency policy and authorities. ~~review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.~~ Requiring and enforcing maintenance requirements will

be implemented through local agency legal authorities.

~~For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.~~

~~If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.~~

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

FILE COPY

CITY HALL
LOS ANGELES, CALIFORNIA 90012-4996

August 26, 1999

Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

The City of Los Angeles (City) is in receipt of the Regional Water Quality Control Board's (RWQCB) proposal to require the 85 Co-Permitee Cities under the Los Angeles County Municipal Stormwater Permit to establish a regulatory program to require new and re-development projects within the seven categories specified to retain 85% of a 24-hour runoff event within the facility's boundaries. While the City supports stormwater pollution reduction programs, we are mindful that such programs need to be cost-efficient and result in real water quality benefits. As the RWQCB is aware, the 85 Co-Permittee Cities have several concerns regarding runoff retention requirements. Several of these concerns were specifically commented on at the RWQCB's August 10, 1999, public workshop. Despite these concerns, the RWQCB staff is recommending adoption of a 85% retention runoff requirement, with no explanation or information provided to support the regulatory proposal. The City therefore, requests that the RWQCB release for a 30-day public review period the data, information, and reasoning which explains and supports the RWQCB's regulatory proposal in order to provide the public and the regulated community with the opportunity to provide meaningful in-put and comments on the proposed regulatory requirement.

We would specifically request that the RWQCB address the issues and concerns associated with the runoff retention requirement discussed by the Development Planning Subcommittee during development of the Standard Urban Stormwater Mitigation Plans (SUSMP). Not including the runoff retention requirement in the SUSMPs was not an oversight, but was a decision based upon the current state of knowledge and the legislative responsibilities of local governments. The following are a sample of the concerns expressed through that process: 1) there is a clear lack of knowledge regarding the cost and benefits of the requirement as it relates to each of the seven development categories in southern California; 2) the establishment of a requirement for the seven

categories identified would be arbitrary and capricious without a quantitative review as to the appropriateness of the seven categories as priorities (i.e. Phase I facilities and other facilities which may be of greater concern are not captured); 3) the potential competitive disadvantage created by such a requirement in only Los Angeles County, rather than the southern California region as a whole; 4) potentially significant impacts to small business created by such a potentially costly requirement; 5) the substantial level of uncertainty as to how such a requirement would be met "on the ground," and; 6) the potential multi-media environmental impacts of such a requirement.

The proposed 85% of a 24-hour runoff event retention regulatory requirement has potentially significant cost implications. Although at the August 10, 1999, public workshop cost estimates and pollution reduction data was referred to, no such data or information was presented for review or consideration. In addition, such information was cited as being available in documents prepared for areas not in of the State of California, let alone the southern California region. Clearly the costs of such requirements in southern California are expected to be different than those in Colorado or Texas. The City therefore, requests that the cost estimates for compliance with the proposed requirements, the pollution reduction data for each of the seven categories, the associated cost/benefit analyses for each of the seven categories, and the RWQCB's analyses of the potential multi-media environmental impacts from the proposed requirement (i.e. the California Environmental Quality Act documentation and supporting information developed for this specific discretionary regulatory action) be released for a 30-day public review and comment period. In addition, the City requests the opportunity to review the RWQCB's analyses of those issues raised by local government, business, and industry during the SUSMP development process and the August 10, 1999, workshop, and the justification for determining those concerns invalid or outweighed by the potential water quality benefits of the requirement.

Finally, to enable impacted local governments, businesses, and industry to fully understand the regulatory context of the proposed requirement, the City requests that the RWQCB specifically identify the regulatory authority under which it proposes to establish such a runoff retention requirement. Within the context of the Municipal Stormwater Permit, the City has been unable to identify the provision under which the RWQCB is provided independent authority to establish additional regulatory requirements for the Permitees, without amending the Permit itself. Therefore, it is unclear whether the RWQCB proposes to amend the Municipal Stormwater Permit or to promulgate the proposed regulatory requirement pursuant to some other legal authority.

The City looks forward to reviewing the RWQCB's supporting information and data regarding the proposed 85% retention of a 24-hour runoff event and to working with the RWQCB to resolve outstanding concerns and issues. We anticipate submitting comments on the proposed regulatory requirement once we have had an adequate opportunity to evaluate the basis of the proposed requirement. We further anticipate submitting comments specific to the SUSMP's submitted by Los Angeles County under separate correspondence.

If you have any questions or require additional information, please contact Gary Lee Moore at (213) 847-6346.

Very truly yours,

Ronald F. Deaton
Chief Legislative Analyst

Judith Wilson
Director, Bureau of Sanitation

City of Lynwood
11330 Bullis Road
Lynwood, CA 90262

facsimile transmittal

To:	Dennis Dickerson	**Fax:**	213-576-6640
From:	Christian Valtierra, Proj. Mgr	**Date:**	09/16/99
Re:	SUSMP Numerical Standards	**Pages:**	3
CC:	Scott K. Pomreha		

x Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycl

Enclosed please find a copy of City of Lynwood Resolution No. 99-145 opposing numeric limits on the treatment or retention of storm water runoff from new developments pursuant to the Los Angeles County Municipal NPDES permit. Original will be mailed..

Please call me if you have any questions at 310-603-0220 extension 200.

RESOLUTION NO. 99.145

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LYNWOOD URGING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, NOT TO IMPOSE NUMERIC LIMITS ON THE TREATMENT OR RETENTION OF STORM WATER RUNOFF FROM NEW DEVELOPMENTS PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL NPDES PERMIT

WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region (hereinafter "regional board") is considering the incorporation of numeric limits into the Standard Urban Storm Water Runoff Mitigation Plan component of the model development planning program – a requirement associated with the Los Angeles County Municipal NPDES permit (hereinafter, "municipal NPDES permit"); and

WHEREAS, such numeric limits are intended to retain or treat storm water runoff volume (either .60" or .75" of rain) from 7 categories of new development projects, including gas stations, restaurants, auto repair facilities, 10-99 housing sub-divisions, 100-plus housing sub-divisions, single-family hillside homes, and 100,000 square foot commercial developments; and

WHEREAS, meeting the proposed numeric limits would necessitate the imposition of structural controls on new developments, including but not limited to extended detention basins, wet ponds, infiltration basins/ponds (which reduce the amount of developable space), storm drain-connected oil/grit separators, catch basin inserts, grassy swales, and other devices, many of which have not been proven to be cost-effective, and

WHEREAS, such structural controls would require post-construction operation and maintenance, which cities would be required to enforce; and

WHEREAS, such controls, if not properly designed or maintained, could become sources of pollution rather than pollution mitigants; and

WHEREAS, storm water treatment and retention numeric limits are not specifically mandated in the municipal NPDES permit and are not a requirement associated with other municipal NPDES permits issued in the State of California; and

WHEREAS, neither the regional board nor any other interested party has provided compelling justification for the use of numeric limits for treating or retaining storm water runoff from new developments; and

WHEREAS, neither the regional board nor any other interest party has demonstrated that storm water retention/treatment numeric limits would result in the improvement or protection of a beneficial use of a receiving water; and

WHEREAS, imposing such unproven and questionable numeric limits on cities constitutes an unfunded state mandate, one that has not been evaluated in cost-effective terms, as required by state law.

NOW, THEREFORE, BE IT RESOLVED THAT THE CITY COUNCIL OF THE CITY OF LYNWOOD, STATE OF CALIFORNIA, DOES HEREBY RESOLVE, DECLARE, DETERMINE AND ORDER AS FOLLOWS:

SECTION 1. That the City Council opposes storm water treatment/retention numeric limits.

SECTION 2. That the City Council recommends that the regional board approve the Standard Urban Storm Water Mitigation Plan, which does not include numeric limits, as proposed by the Executive Advisory Committee on August 11, 1999.

SECTION 3. That the City Clerk is directed to send a certified copy of this resolution to the Dennis Dickerson, Executive Officer, California Water Quality Control Board, Los Angeles Region, 320 West 4th Street, Ste 200, L.A. CA 90013.

SECTION 4. That this resolution shall take effect immediately upon its adoption.

PASSED, APPROVED AND ADOPTED this 7th day of September, 1999.

/s/ Ricardo Sanchez
Ricardo Sanchez, Mayor
City of Lynwood

ATTEST:

Andrea L. Hooper
Andrea L. Hooper, City Clerk

Ralph Davis
Ralph Davis, Interim City Manager

APPROVED AS TO FORM:

/s/ Shan Thever
City Attorney

STATE OF CALIFORNIA)
) ss
COUNTY OF LOS ANGELES)

I, the undersigned, City Clerk of the City of Lynwood, do hereby certify that the above and foregoing resolution was duly adopted by the City Council of said City at a regular meeting thereof held in the City Hall of said City on the 7th day of September, 1999, and passed by the following vote:

AYES: COUNCILMEN BYRD, REA, REYES, RICHARDS, SANCHEZ

NOES: NONE

ABSENT: NONE

Andrea L. Hooper
City Clerk, City of Lynwood

STATE OF CALIFORNIA)
) ss.
COUNTY OF LOS ANGELES)

I, the undersigned City Clerk of the City of Lynwood, and Clerk of the City council of said City, do hereby certify that the above and forgoing is a full, true and correct copy of Resolution No. 99.145 on file in my office and that said resolution was adopted on the date and by the vote therein stated.

Dated this 7th day of September, 1999.

Andrea L. Hooper
City Clerk, City of Lynwood

citymanager/mso/council/c99-19r

City of LYNWOOD
A City Meeting Challenges
11330 BULLIS ROAD
LYNWOOD, CALIFORNIA 90262
(310) 603-0220

STATE OF CALIFORNIA)
) SS.
COUNTY OF LOS ANGELES)

I, **ANDREA L. HOOPER, City Clerk** of the City of Lynwood, do hereby certify that the attached is a true and correct copy of :

RESOLUTION NO. 99.145 ENTITLED: "A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LYNWOOD URGING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, NOT TO IMPOSE NUMERIC LIMITS ON THE TREATMENT OR RETENTION OF STORM WATER RUNOFF FROM NEW DEVELOPMENTS PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL NPDES PERMIT".

on file with the City Clerks Office and adopted on the date and by the vote therein stated.

Dated this **15th** day of **September, 1999**.

Andrea L. Hooper, City Clerk
City of Lynwood

MEMOS/CERT

R0069135

City of Maywood

4319 E. Slauson Ave. Maywood, CA 90270 Telephone (213) 562-5000 Fax (213) 773-2806

September 1, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: OPPOSITION TO NUMERICAL MITIGATION MEASURES

Dear Mr. Dickerson:

The City of Maywood would like to express our strong opposition to the recommendation by Regional Board staff to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs). As you know, the Development Planning Model Program required the County, in consultation with Cities, to develop the SUSMPs for seven types of projects listed in the current NPDES Permit. After months of development and countless meetings, Los Angeles County, on behalf of Permittees, submitted the SUSMPs for your approval on July 22,1999 with revisions made on August 12, 1999. As submitted and revised, the SUSMPs did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMPs and was intentionally left out for numerous reasons that will be discussed below.

As proposed, the numeric mitigation measures would require cities to impose on developers and/or property owners structural Best Management Practices (BMPs) aimed at retaining and/or treating the first .75 inches of rainfall within a 24-hour storm event for the following projects: 100^{+} Home Subdivision; 10-99 Home Subdivision; $100{,}000^{+}$ Square-Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant; or Hillside-Located Single-Family Dwelling. Such BMPs would be extremely costly, both in terms of construction and on-going maintenance.

Maywood strongly opposes the proposed language for the following reasons:

- The current Los Angeles County NPDES Permit, like all other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat stormwater runoff from new developments. Maywood feels Board staff has decided to propose such language as a result of pressure from the environmental community and not sound science or engineering

practices. Maywood strongly urges the Regional Board to ask staff what data was used in determining the need for such standards and the level at which the standards were set. In light of the lack of region specific studies, detailed cost-benefit analysis and a decisive link between such mitigation measures and improvement of our receiving waters, the Board should reject the proposed recommendation.

- While other NPDES permits, such as Alameda and Ventura Counties, require post-construction controls for new developments, both permits afford city discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for many years. Having recently suffered through the downsizing of the defense industry, State take-aways and the worst recession in modern times, Maywood can ill afford to implement any requirements that could jeopardize our recent achievements in the economic development arena. Without thorough studies on the effects of such requirements on economic development in the region, such action by the Board will be strongly opposed by local government and the interests they represent.

- As it stands, incorporation of the proposed language will tie the hands of cities and impose standards in Los Angeles County that are not found anywhere else in the State. Economic development will not only suffer on a local basis, but as a region Los Angeles County stands to lose both jobs and revenue to neighboring counties where similar requirements are nonexistent.

  The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers will simply move to Orange, Riverside or Ventura counties to escape the unjustified requirements should they be approved.

- Similar types of requirements have been tried and found to be nearly impossible to implement without some flexibility. The City of Santa Monica requires the retaining and/or treatment of stormwater runoff based on similar numeric mitigation measures to the ones proposed by Board staff. The City of Santa Monica used a runoff coefficient formula to determine what structural controls must be constructed on all development projects. Based on the difficulty developers had in siting the necessary facilities and meeting the goals of the program, the city modified the program to allow developers to make monetary contribution towards the construction of a low-flow dry weather treatment facility.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded state mandate. As such, the requirements should have been subject to the same

cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities. Lacking such analysis, Maywood feels the numeric measures being considered were not based on science or engineering practices, but are arbitrary and a direct result of the influence of the environmental community on Board staff.

- The structural controls necessitated by numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

Maywood is aware that the Regional Board is under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Given the aforementioned concerns and associated questions with regards to the incorporation of the numeric mitigation measures, Maywood supports the approval of the SUSMPs as originally submitted by the Los Angeles County without the problematic numeric measures.

As a follow-up to this letter and to more formally express Huntington Park's opposition to the proposed numeric measures, the Maywood City Council will be requested to adopt a Resolution opposing such measures at its September 14th meeting. The Resolution will be presented to the Regional Board to be formally entered into the public record.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation. Hopefully such research could be completed before the issuance of the next municipal permit scheduled in two years.

Maywood would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government. Hopefully, you will agree with us that without supportive evidence that such requirements will achieve measurable goals and the cost benefit analysis justifies such mandates, the issue should be tabled.

Should you have any questions regarding Maywoods's position, please contact Wes Lind, NPDES Engineer at 626-585-0767.

Respectfully,

Wes Lind
NPDES Engineer

City of Montebello

ALL AMERICA CITY

1600 W. BEVERLY BOULEVARD
MONTEBELLO, CA 90640
(213) 887-1200

September 15, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water
Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

REFERENCE: OPPOSITION TO NUMERICAL MITIGATION MEASURES

Dear Mr. Dickerson:

The City of Montebello would like to express our opposition to the recommendation by Regional Board staff, to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs). As you know, the Development Planning Model program required the County, in conjunction with Cities, to develop the SUSMPs for seven types of projects listed in the current NPDES Permit. After months of development and countless meetings, Los Angeles County, on behalf of Permittees, submitted the SUSMPs for your approval on July 22, 1999, with revisions made on August 12, 1999. As submitted and revised, the SUSMPs did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMPs, and was intentionally left out for numerous reasons that will be discussed below.

As proposed, the numeric mitigation measures would require cities to impose on developers and/or property owners, structural Best management Practices (BMPs) aimed at retaining and/or treating the first .75 inches of rainfall within a 24-hour storm event for the following projects: 100+ Home Subdivision; 10-99 Home Subdivision; 100,000+ Square Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant, or Hillside-Located Single-Family Dwelling. Such BMPs would be extremely costly, both in terms of construction and on-going maintenance.

Montebello opposes the proposed language for the following reasons:

- The current Los Angeles County NPDES Permit, like all other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat storm water runoff from new developments. Montebello feels that sound science or engineering practices should guide this decision. We urge the Regional Board to

ask staff what data was used in determining the need for such standards, and the level at which the standards were set. In light of the lack of region specific studies, detailed cost-benefit analysis, and a decisive link between such mitigation measures and improvement of our receiving waters, we ask the Board to reconsider the proposed recommendation.

- While other NPDES permits, such as Alameda and Ventura Counties require post-construction controls for new developments, both permits afford City discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove City discretion in the Los Angeles region, and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied, and could severely hurt regional economic development for many years. Having recently suffered through the downsizing of the defense industry, State take-aways and a worst recession, Montebello can ill afford to implement any requirements that could jeopardize our recent achievements in the economic development arena. Without thorough studies on the effects of such requirements on economic development in the region, such action by the Board would be opposed by local government for the aforementioned reasons.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded State mandate. As such, the requirements should have been subject to the same cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities.

- The structural controls necessitated by numeric measures would be required without regard to siting factors, and may result in other problems much more problematic than the original issue being addressed.

Montebello is aware that the Regional Board may be under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Based on the information outlined in this correspondence, Montebello supports the approval of the SUSMPs as originally submitted by Los Angeles County, without the problematic numeric measures.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be

reopened for evaluation. Hopefully, such research could be completed before the issuance of the next municipal permit scheduled in two years.

Montebello would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government. Should you have any questions regarding Montebello's position, please contact me, or you may contact Mr. Carlos Dillon of my staff at (323) 887-1470.

Sincerely,

Richard Chen
City Engineer

SB:CD:ab

MICHAEL MENDEZ
Mayor

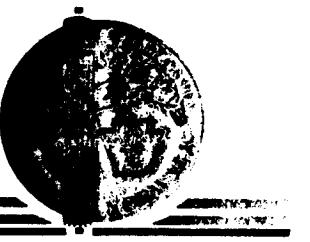
CHERI KELLEY
Vice Mayor

RUDY BERMÚDEZ
Councilmember

JESSE M. LUERA
Councilmember

GORDON STEFENHAGEN
Councilmember

ERNIE V. GARCIA
City Manager



12700 NORWALK BLVD., P.O. BOX 1030, NORWALK, CA 90651-1030 • PHONE: 562/929-5700 • FACSIMILE: 562/929-5773

September 9, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Re: OPPOSITION TO NUMERICAL MITIGATION MEASURES

Dear Mr. Dickerson:

The City of Norwalk would like to express our strong opposition to the recommendation by Regional Board staff to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs). As you know, the Development Planning Model Program required the County, in consultation with cities, to develop the SUSMPs for seven types of projects listed in the current NPDES Permit. After months of development and countless meetings, Los Angeles County, on behalf of Permittees, submitted the SUSMPs for your approval on July 22,1999, with revisions made on August 12, 1999. As submitted and revised, the SUSMPs did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMPs and was intentionally left out for numerous reasons that will be discussed below.

As proposed, the numeric mitigation measures would require cities to impose on developers and/or property owners structural Best Management Practices (BMPs) aimed at retaining and/or treating the first .75 inches of rainfall within a 24-hour storm event for the following projects: 100^{+} Home Subdivision; 10-99 Home Subdivision; $100{,}000^{+}$ Square-Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant; or Hillside-Located Single-Family Dwelling. Such BMPs would be extremely costly, both in terms of construction and on-going maintenance.

The City of Norwalk strongly opposes the proposed language for the following reasons:

- The current Los Angeles County NPDES Permit, like all other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat stormwater runoff from new developments. Norwalk feels Board staff has decided to propose such language as a result of pressure from the environmental community and not sound science or engineering practices. We strongly urge the Regional Board to ask staff what data was used in determining the need for such standards and the level at which the standards were set. In light of the lack of region specific studies, detailed cost-benefit analysis and a decisive link between such mitigation measures and improvement of our receiving waters, the Board should reject the proposed recommendation.

- While other NPDES permits, such as Alameda and Ventura Counties, require post-construction controls for new developments, both permits afford city discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for many years. Having recently suffered through the downsizing of the defense industry, State take-aways and the worst recession in modern times, Norwalk can ill afford to implement any requirements that could jeopardize our recent achievements in the economic development arena. Without thorough studies on the effects of such requirements on economic development in the region, such action by the Board will be strongly opposed by local government and the interests they represent.

- As it stands, incorporation of the proposed language will tie the hands of cities and impose standards in Los Angeles County that are not found anywhere else in the State. Economic development will not only suffer on a local basis but as a region, Los Angeles County stands to lose both jobs and revenue to neighboring counties where similar requirements are nonexistent.

  The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers will simply move to Orange, Riverside or Ventura counties to escape the unjustified requirements should they be approved.

- Similar types of requirements have been tried and found to be nearly impossible to implement without some flexibility. The City of Santa Monica requires the retaining and/or treatment of stormwater runoff based on similar numeric mitigation measures to the ones proposed by Board staff. The City of Santa Monica used a runoff coefficient formula to determine what structural controls must be constructed on all development projects. Based on the difficulty developers had in siting the necessary facilities and meeting the goals of the program, the City modified the program to allow developers to make monetary contribution towards the construction of a low-flow dry weather treatment facility.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded state mandate. As such, the requirements should have been subject to the same cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities. Lacking such analysis, We feel the numeric measures being considered were not based on science or engineering practices, but are arbitrary and a direct result of the influence of the environmental community on Board staff.

- The structural controls necessitated by numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

Norwalk is aware that the Regional Board is under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Given the aforementioned concerns and associated questions with regards to the incorporation of the numeric mitigation measures, Norwalk supports the approval of the SUSMPs as originally submitted by the Los Angeles County without the problematic numeric measures.

As a follow-up to this letter and to more formally express Norwalk's opposition to the proposed numeric measures, the Norwalk City Council is scheduled to adopt a Resolution opposing such measures at its September 21st meeting. This letter will be presented to the Regional Board at their September 16th meeting to be formally entered into the public record, followed by submittal of the aforementioned Resolution.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation. Hopefully, such research could be completed before the issuance of the next municipal permit scheduled in two years.

The City of Norwalk would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government. Hopefully, you will agree with us that without supportive evidence that such requirements will achieve measurable goals and the cost benefit analysis justifies such mandates, the issue should be tabled.

Should you have any questions, please contact Gerald Stock, City Engineer, at (562) 929-5727.

Respectfully,

Michael Mendez
Mayor

Cc: Norwalk City Councilmembers
Ernie Garcia, City Manager
Kurt Anderson, Director of Community Development
Gerald Stock, City Engineer
Central File

GENE DANIELS
Mayor

MANUEL E. GUILLEN
Vice Mayor

HENRY HARKEMA
Councilmember

PEGGY LEMONS
Councilmember

DIANE J. MARTINEZ
Councilmember

City Manager
(562) 220-2222

September 16, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: OPPOSITION TO NUMERICAL MITIGATION MEASURES

Dear Mr. Dickerson:

The City of Paramount would like to express our strong opposition to the recommendation by Regional Board staff to incorporate numeric mitigation measures into the Standard Urban Stormwater Mitigation Plans (SUSMPs). As you know the Development Planning Model Program required the County, in consultation with Cities, to develop the SUSMPs for seven types of projects listed in the current NPDES Permit. After months of development and countless meetings, Los Angeles County, on behalf of Permittees, submitted the SUSMPs for your approval on July 22,1999 with revisions made on August 12, 1999. As submitted and revised, the SUSMPs did not contain the numeric mitigation measures language that is now being recommended by Board staff. Such language was discussed at length during the development of the SUSMPs and was intentionally left out for numerous reasons that will be discussed below.

As proposed the numeric mitigation measures would require cities to impose on developers and/or property owners structural Best Management Practices (BMPs) aimed at retaining and/or treating the first .75 inches of rainfall within a 24-hour storm event for the following projects: 100+ Home Subdivision; 10-99 Home Subdivision; 100,000+ Square-Foot Commercial Development; Automotive Repair Shop; Retail Gasoline Outlet; Restaurant; or Hillside-Located Single-Family Dwelling. Such BMPs would be extremely costly, both in terms of construction and on-going maintenance.

R0069146

The City of Paramount strongly opposes the proposed language for the following reasons:

- The current Los Angeles County NPDES Permit, like all other municipal NPDES permits in California, contains no language requiring cities to retain and/or treat stormwater runoff from new developments. Paramount strongly urges the Regional Board to ask staff what data was used in determining the need for such standards and the level at which the standards were set. In light of the lack of region specific studies, detailed cost-benefit analysis, and a decisive link between such mitigation measures and improvement of our receiving waters, the Board should reject the proposed recommendation.

- While other NPDES permits, such as Alameda and Ventura Counties, require post-construction controls for new developments, both permits afford city discretion in determining which types of projects and which types of structural controls are appropriate for a specific project. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for many years. As it stands, incorporation of the proposed language will tie the hands of cities and impose standards in Los Angeles County that are not found anywhere else in the State. Economic development will not only suffer on a local basis, but as a region Los Angeles County stands to loss both jobs and revenue to neighboring counties where similar requirements are nonexistent.

  The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers will simply move to Orange, Riverside, or Ventura counties to escape the unjustified requirements should they be approved.

- Similar types of requirements have been tried and found to be nearly impossible to implement without some flexibility. The City of Santa Monica had required numeric limits on retaining/treating storm water runoff through rigid runoff coefficients on all development projects. Based on the difficulty developers had in meeting the required goals, the city modified the program to allow developers to make monetary contribution towards the construction of a low-flow dry weather treatment facility.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded state mandate. As such, the requirements should have been subject to some form of cost-benefit analysis. To date, no such analysis has been provided to cities.

- The structural controls necessitated by numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

Paramount is aware that the Regional Board is under pressure to approve the SUSMPs, which were required to be implemented by July 30, 1999. Given the aforementioned concerns and associated questions with regards to the incorporation of the numeric mitigation measures, Paramount supports the approval of the SUSMPs as originally submitted by the Los Angeles County without the problematic numeric measures.

At such time sufficient information in the form of studies and research is available regarding the implementation of numerical measurements, the subject could be reopened for evaluation. Hopefully such research could be completed before the issuance of the next municipal permit schedule in two years.

Paramount would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government. Hopefully, you will agree with us that without supportive evidence that such requirements will achieve measurable goals and the cost benefit analysis justifies such mandates, the issue should be tabled.

Should you have any questions regarding the Paramount's position, please contact Harry Babbitt, Public Works Director at (562) 220-2020.

CITY OF PARAMOUNT

Patrick H. West
City Manager

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

PUBLIC WORKS AND TRANSPORTATION DEPARTMENT

January 13, 2000

Mr. Dennis Dickerson, Executive Director
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Dear Mr. Dickerson:

SUSMPs and Numerical Limits

The City of Pasadena would like to acknowledge the challenge that the Board has encountered in developing requirements for the cities in Los Angeles County in regards to the Planning and Development procedures. As a regulatory agency, the City itself has been involved with various policy-making issues, which are often controversial or difficult to implement because of various social and economic reasons.

The City engages in many events, which create a more transient situation in the City. As the result of these activities, the City has no option other than implementing a very active maintenance program as well as continuously updating and reviewing its policies to insure both the quality of its urbanization and the restoration of its natural resources. This makes the City conscious of the environmental and urban runoff issues.

The City supports the Board in reference to the Standard Urban Stormwater Mitigation Plans or SUSMPs with the understanding that details such as design requirements may have to be worked out in the future. The numerical limit guidelines must be practical, efficient, and implementable. SUSMPs and their requirements may work in some areas or projects and not in all in others. The SUSMPs' requirements will have to be flexible, yet efficient, with the notion that "one size may not fit all".

The City hopes that the Board's staff recognizes that problems may occur in the future, which may act as obstacles towards implementing the subject requirements. The goal of imposing such requirements on development/redevelopment will be to reduce or mitigate potential pollution runoff from urbanized areas. This will be a very dynamic and progressive procedure that will only improve with time and practice.

R0069149

100 North Garfield Avenue · P.O. Box 7115 · Pasadena, CA 91109-7215
(626) 744-4191

City of Pasadena will work in a cooperative spirit with everyone involved. We hope this letter serves as an appreciation of all your efforts. Please feel free to contact Mr. Jim Valentine of this office at (626) 744-4265 regarding our storm water/urban runoff program.

Sincerely,

DANIEL A. RIX
City Engineer

Cc: Cynthia J. Kurtz, City Manager
Jack Lidyard, Acting Director of Public Works and Transportation
Darrell Lewis, Director of Planning and Permitting
Sheila Kennedy, John L. Hunter and Associates

JEV:kf

BLANK

RANCHO PALOS VERDES

January 4, 2000

Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, California 90013

Dear Mr. Dickerson:

Proposed Standard Urban Stormwater Plans (SUSMP)

As a coastal community, the City of Rancho Palos Verdes appreciates the Regional Board's ongoing effort to improve the quality of stormwater runoff. In the City's continuing effort to do its part, the Planning Department has received training in and developed an extensive interim SUSMP program. This program, which closely parallels your proposed program, went into effect in early 1999. Upon the anticipated approval of your program, we will make the few changes needed to standardize our program.

As with any regulatory program, a small segment of the public will always look for exceptions to or ways of challenging requirements. As a city with a very large proportion of hillside areas compared to other cities, we expect many questions regarding the definition of "Hillside". The proposed definition:

> *"Property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope and where grading contemplates cut or fill slopes"*

is somewhat open to interpretation and is likely to necessitate a lengthy review for projects on an individual basis. This could be a considerable undertaking for our City's small staff. In the interest of avoiding lengthy evaluations, we ask that consideration be given to the inclusion of a numerical criteria for triggering the hillside SUSMP process for projects of 1 acre or less. This will make implementation smoother and avoid challenges to the SUSMP requirements by contractors and developers. Projects over 1 acre are large enough that a case by case evaluation can be made.

R0069152

30940 Hawthorne Boulevard / Rancho Palos Verdes, CA 90275-5391 / (310) 377-0360 / FAX (310) 377-9868
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With the deadline for comments less than two weeks away, the preparation and submittal of a detailed proposal for your review is not feasible. However, we will prepare recommendations for your staff's review upon your acknowledgment that a numerical criteria may be acceptable. In the interim, we will continue to implement the SUSMP program with the enthusiasm of a city concerned with creating the best possible environment for our citizens.

Sincerely,

Dean Allison, P.E.
Director of Public Works

Tom Hollingsworth - Mayor
Lee Byrd - Mayor Pro Tem
Marilyn Lyon - Councilmember
John C. McTaggart - Councilman
Barbara Ferraro - Councilmember

RANCHO PALOS VERDES

RECEIVED
SEP 14 1999
BY:

September 9, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: OPPOSITION TO SUSMP NUMERIC LIMITS

Dear Mr. Dickerson:

The City of Rancho Palos Verdes (hereinafter "City") understands that the regional board will be considering incorporating numeric limits into the Standard Urban Stormwater Mitigation Plan (SUSMP) at its September 16, 1999 meeting. The numeric limits proposed by regional board staff are aimed at retaining and/or treating .75" of storm water during a 24-hour storm event from seven (7) categories of new developments. The City also understands that the County of Los Angeles -- the principal permittee under the Los Angeles County Municipal NPDES Permit ("NPDES Permit") -- has already agreed to this standard by way of its settlement agreement with the environmental community.

The City writes to inform you that at a City Council meeting on September 7, 1999, it considered the above matter and voted to oppose this proposed requirement. This letter is for opposition to this proposed requirement for the following reasons:

- The NPDES permit contains no language requiring cities to retain/treat any volume of storm water runoff from new developments.
- No other municipal permit in California requires a numeric limit for the retention or treatment of storm water runoff.
- Although other counties in California, such as Alameda and Ventura, require post-construction controls for new developments, they afford cities broad discretion in determining which types of projects and structural controls to impose on developers.

R0069154

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- Although the City of Santa Monica has required numeric limits on retaining/treating storm water runoff through rigid runoff coefficients, its experience with developers has proven that such requirements are difficult to meet.
- If approved, the numeric limits would require cities to impose upon 7 types of new developments costly structural controls (infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof), without regard for whether such controls are needed or whether they would be effective or necessary insofar as protecting a beneficial use of a receiving water.
- The structural controls required to meet a numeric retention/treatment limit would (1) require a high degree of maintenance, which cities would be responsible for enforcing; and (2) if not properly maintained, could become sources of pollution rather than pollution mitigants.
- The numeric limits constitute an unfunded state mandate and have not been evaluated for cost-effectiveness- as required under California law.
- The numeric limits now being considered were not based on science or engineering, but on a negotiated agreement, and are therefore arbitrary.
- The structural controls necessitated by numeric limits would be required without regard to siting factors (soil conditions and other environmental considerations).
- The use of some structural controls such as detention basins/ponds and vegetative buffers are even more undesirable because they reduce the amount of developable area.
- Because cities and developers have little experience in the use of detention/ treatment structural controls- coupled with the effect that the SUSMP would require their immediate imposition- there is the danger that such controls could be mis-prescribed, as has happened in other parts of the country.

It should be noted that the Rancho Palos Verdes City Council voted 4-0 in favor of this opposition, with Councilmember Marilyn Lyon abstaining from that vote.

Finally, it should also be noted that the NPDES municipal permit Executive Advisory Committee (EAC) has also taken a position against numeric limits.

Sincerely,

Tom Hollingsworth
Mayor, City of Rancho Palos Verdes

Cc: City Councilmember
Les Evans, City Manager
Dean E. Allison, Director of Public Works

R0069155

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Santa Clarita

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Suite 300
Santa Clarita
California 91355-2196
Website: www.santa-clarita.com

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(661) 259-8125



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

September 9, 1999

Dr. Xavier Swamikannu
California Regional Water Quality
Control Board – Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Dr. Swamikannu:

Thank you for the opportunity to comment on the proposed Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted to you for approval. The City of Santa Clarita is concerned that the proposed SUSMPs include inappropriate measures that will limit the City's ability to approve development projects and potentially impose costly and inappropriate mitigation measures.

It is the City's understanding that an across-the-board quantitative design standard for treatment control BMPs is being contemplated by the Regional Board staff for incorporation in the final version of the SUSMPs. The anticipated approach would require all runoff from new development (or certain categories of development) up to a design depth (which translates to a design volume) to be captured and treated. The City recognizes that a single water quality depth/volume standard concept was proposed to provide a simple, uniform "baseline" for all permittees and developers. However, the approach has several difficulties in application.

If a standard is to be applied, it should be limited to the volume of runoff from impervious surfaces. This addresses runoff from areas of a site that result in the greatest increase in both runoff and pollutant loadings compared to pre-development conditions. Furthermore, such an approach provides a direct incentive to reduce impervious surfaces, one of the key criteria for post-construction BMPs called out in the permit.

Second, many developments, particularly medium to small residential land use may have very limited flexibility in site planning and subdivision layout to effectively convey all to a point where it can be treated. There needs to be a greater flexibility in applying blanket criteria to all development.

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Third, establishing a criteria based only on runoff depth/volume provides a starting basis for sizing volumetric-based controls (e.g. detention basins, infiltration), but gives no consistent basis for sizing flow-based controls (e.g. vegetated swales, catch basin inserts). For many sites, flow based controls may be more appropriate to consider than volumetric-based controls. Design criteria for flow-based controls must be expressed in terms of an associated return period and event duration. There are methodologies that could be applied to establish criteria that in the long run would yield treatment of approximately similar quantities of runoff as the volume-based criteria.

Finally, a uniform capture volume does not recognize, nor allow flexibility to take into account all the variables such as location, site conditions and constraints, local hydrology, and the sensitivity of the receiving water. Alternative design sizing approaches should be considered and allowed including the approach used in the California BMP Handbook (Municipal) and the WEF/ASCE Urban Runoff Quality Management Manual of Practice both of which target a percent capture volume. Using such methods, the required capture volume is usually set at the "knee of the curve", the point beyond which the incremental capture of runoff diminishes relative to the incremental increase in required basin volume and, therefore basin cost and land requirements. It is important to note that pollutant removal effectiveness is not highly sensitive to selection of the percent capture. Refinement of the BMP Handbook approach can be accomplished at the community level by redoing the analysis using local rainfall statistics and hydrologic parameters.

While treatment control may be an effective method of treating stormwater runoff, it should not be considered the only method. Previous versions of the SUSMPs included source control BMPs appropriate to the land use. We believe that an effective stormwater program should include source control as an effective method of addressing runoff in land development. Removing source control BMPs limits our ability to consider all possible mitigation alternatives, such as the much more cost-effective source control BMPs, combined with appropriate treatment BMPs.

In addition to the technical issues we have raised, there are more far reaching policy issues that must be resolved prior to the implementation of this program. The Porter-Cologne Water Quality Control Act states, "No waste discharge requirement or other order of a regional board or the state board or decree of a court issued under this division shall specify the design, location, type of construction, or particular manner in which compliance may be had with that requirement, order, or decree, and the person so ordered shall be permitted to comply with the order in any lawful manner..." This language allows cities to select the methods it wishes to use to control discharges to the maximum extent practicable.

SUSMPs should be used as guidance, allowing for flexibility for each City to establish conditions based on actual site specific conditions for each proposed land development project. This flexibility ensures that the City can address site specific conditions and allow the City to select the actual methods it plans to use for controlling discharges to the maximum extent practicable.

To reiterate a statement made in a letter to you from the Executive Advisory Committee, the imposition of numeric limits and costs to the public that will result from these limits without supporting information is poor public policy. The Regional Board, County of Los Angeles and the cities in the County all exist to serve and to protect the health, safety and well being of the same public. It is to our advantage to work together to gather and analyze the information that is needed to support requirements with scientific fact.

This program will have significant fiscal impact on the development community, as well as local agencies. This will lead to market impacts, likely eliminating the "business-friendly" atmosphere necessary for local government to exist and thrive in today's global economy. Many local governments are struggling to become more sustainable, balancing economic viability, environmental preservation and social equity. The proposed SUSMPs put local government in a situation where the balance no longer exists and environmental preservation, at the urging of

environmental groups, has taken precedent. We request that the Regional Board take the time to study the issue and develop a cost-effective, efficient and legally defensible program which will ultimately enhance the water quality in the Los Angeles region, without sacrifices to other programs or efforts.

Sincerely,

Amelia Rietzel for

Anthony J. Nisich
Director of Transportation & Engineering Services

AJN:JCG
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cc: Jeffrey Lambert, Director of Planning & Building Services
Amelia Rietzel, Environmental Services Coordinator

City of Santa Fe Springs
11710 Telegraph Road • CA • 90670-3679 • (562) 868-0511 • Fax (562) 868-7112 • www.santafesprings.org

September 2, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Subject: NPDES – Opposition to Numerical Mitigation Measures Proposed for Incorporation into SUSMPs

Dear Mr. Dickerson:

The City of Santa Fe Springs would like to express our strong opposition to the recommendation by Regional Board staff to incorporate numeric mitigation measures for BMP design criteria into the Standard Urban Stormwater Mitigation Plans (SUSMPs).

As you are aware, the Los Angeles County Department of Public Works (LACDPW), in consultation with Cities, was required, under the Development Planning Model Program, to develop SUSMPs for several categories specified in the Permit. After a lengthy development process, the SUSMPs were submitted for your approval, on July 22,1999. After receiving comments, revisions were made, and the SUSMPs were resubmitted on August 12, 1999. Neither the original nor the revised SUSMPs contained numeric mitigation measures language. Ironically, such language was discussed at length during the development of the SUSMPs and intentionally omitted.

The City of Santa Fe Springs strongly opposes the incorporation of the proposed language for the following reasons:

- The Los Angeles County NPDES Municipal Permit, like other California permits, currently contain no language requiring cities to retain and/or treat stormwater runoff from new developments. Santa Fe Springs believes that Board staff is proposing this language as a result of pressure from the environmental community, not sound science or engineering practices. Therefore, it is requested that the Regional Board ask staff to provide the data used in determining the need for such standards and the level at which the standards were set. In the event this information is not provided, the Regional Board should reject the proposed recommendation.

R0069160

George Minnehan, Mayor • Betty Putnam, Mayor Pro-Tempore
City Council
Louie González • Ronald S. Kernes • Albert L. Sharp
City Manager
Frederick W. Latham

- While other NPDES permits, such as Alameda and Ventura Counties, require post-construction controls for new developments, these permits also afford city discretion in determining the type of project and structural controls that are appropriate. The proposed language would remove city discretion in the Los Angeles region and mandate how and when cities will require certain structural controls regardless of local conditions or mitigating factors.

- The economic impacts of the proposed requirements have not been fully studied and could severely hurt regional economic development for years to come. By implementing these requirements the City could jeopardize recent achievements in economic development. Without thorough studies on the effects of such requirements on the economic development of the region, the requirements by the Board will be strongly opposed by local governments and the interests they represent.

- The incorporation of the proposed language would have not only a local effect, but a regional one as well. (The argument was made by the City of Long Beach during the approval of their permit that Long Beach would be put at a great economic development disadvantage should they be required to mandate such mitigation measures while neighboring cities did not. The same argument holds true on a larger countywide basis. Developers may simply move to Orange, Riverside or Ventura counties to escape the unjustified requirements should they be approved.)

- Similar types of requirements have been tried and found to be nearly impossible to implement without flexibility. The City of Santa Monica requires the retaining and/or treatment of stormwater runoff based on similar numeric mitigation measures as those currently proposed by Board staff. The City of Santa Monica used a runoff coefficient formula to determine which structural controls would be required on all developments. Based on the difficulty developers had in siting the necessary facilities and meeting the goals of the program, the city modified the program to allow developers to make monetary contribution towards the construction of a low-flow dry weather treatment facility.

- The costs associated with the proposed numeric mitigation measures may constitute an unfunded state mandate. As such, the requirements should have been subject to the same cost-benefit analysis as other similar programs. To date, no such analysis has been provided to cities. Lacking such analysis, the recommendation should be disregarded.

- The structural controls necessitated by numeric measures would be required without regard to siting factors and may result in other problems much more problematic than the original issue being addressed. For example, if sited in a high water table area, pollutants that are leached into the ground through pervious surfaces could contaminate groundwater. Soil conditions and the susceptibility of an area to liquefaction could impact the implementation of controls and could create additional problems unforeseen at this time.

Although the Regional Board is under pressure to approve the SUSMPs because of the July 30, 1999 implementation date, the aforementioned concerns and associated questions provide substantial reasons not to incorporate numeric mitigation measures at this time.

The City of Santa Fe Springs therefore supports the approval of the SUSMPs as originally submitted by the LACDPW without the numeric mitigation measures.

In conjunction with this letter and to more formally express Santa Fe Springs' opposition to the proposed numeric mitigation measures, the Santa Fe Springs City Council is scheduled to adopt a Resolution opposing such measures at its September 9, 1999 meeting. The Resolution will be presented to the Regional Board at their September 16, 1999 meeting to be formally entered into the public record.

At such time as sufficient information in the form of studies and research is available regarding the implementation of numerical mitigation measures, the subject could be reopened for evaluation. Hopefully such research could be completed before the issuance of the next municipal permit scheduled in two years.

Santa Fe Springs would like to thank the Regional Board and Board staff for their continued support and understanding of the concerns of local government.

Should you have any questions please contact Sarina Morales-Choate, of this office at (562) 868-0511, extension 281.

Respectfully,

John R. Price,
Director of Public Works

JRP/smc/at

Xc: Scott Pomrehn, City of Lakewood, 5050 N Clark Avenue, Lakewood, CA 90712
fax (562) 866-0505

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Council Meeting: January 25, 2000 Santa Monica, California

TO: Mayor and City Council

FROM: City Staff

SUBJECT: Recommendation to Adopt a Resolution to Support the Efforts of the Los Angeles Regional Water Quality Control Board to Establish a Numerical Standard for Stormwater Runoff Reductions in the Standard Urban Stormwater Mitigation Plan.

Introduction

This report recommends that the City Council adopt a resolution in support of the Los Angeles Regional Water Quality Control Board's effort to establish a numerical standard for reducing stormwater runoff from a parcel during each storm event.

Background

Approximately 50 percent of rainfall in the greater Los Angeles area becomes urban runoff, carrying a mixture of heavy metals, organic chemicals, pathogens, nutrients and sediments from parking lots, streets, sidewalks, rooftops and yards into the Santa Monica Bay. Urban runoff, according to the U.S. Environmental Protection Agency, is the single greatest source of water pollution in the ocean, contributing 50-60 percent of the pollutant load. Visitation rates to Santa Monica beaches have dropped dramatically during the past 15 years in large part due to more frequent and larger incidents of beach and ocean contamination. Recent studies have concluded that people who swim near flowing storm drains are more susceptible to contracting certain illnesses.

In 1993, Santa Monica adopted one of the nation's first urban runoff pollution control

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ordinances to reduce ocean pollution from both new construction and existing parcels. The Santa Monica ordinance requires a minimum 20% reduction in urban runoff from all newly developed parcels in addition to specific runoff reduction requirements for surface parking lots and also specifies guidelines for existing properties and new construction sites.

The Executive Officer of the Los Angeles Regional Water Quality Control Board has recommended a numerical standard for onsite rainfall retention to capture a larger percentage of runoff events, that is, runoff volume and pollutant loads. The current recommendation to the Board includes a numerical standard of 0.75 inches per 24-hour period of rainfall – the first three-quarters inch of a rain falling in 24 hours must be retained on site for percolation. By requiring a numerical standard for new development, such as that found in the City's Urban Runoff Pollution Ordinance, less urban runoff finds its way to the Bay, thereby reducing the overall amount of ocean pollution.

Discussion

Many of the co-permittees and regional building associations oppose a numerical standard for stormwater reduction, citing the potential for excessive costs to be imposed on cities and private construction projects, concern that BMPs are not effective in removing specific pollutants, and inadequate information on whether certain pollutants are a problem in the Bay and need to be controlled in the first place. They support, instead, a regulation that would require retention to the "*maximum extent practicable*".

Supporters of the proposed requirements include many individual citizens and major

30

environmental groups including Heal the Bay, NRDC, BayKeeper and TreePeople. The environmental groups called for a 100% retention standard originally, but support the highest possible standard. Many of the interested environmental groups fear that without a specific numerical standard municipalities will not aggressively require urban runoff retention since interpretation of *maximum extent practicable* will be inevitably ambiguous.

The City is the only co-permittee city where staff has publicly expressed support for the Board's efforts to approve a numerical standard. The City of Calabasas has a municipal ordinance similar to Santa Monica's and has expressed at various meetings its support of strategies to put more storm runoff back into the ground, but has not publicly commented on the proposed requirements. The City of Los Angeles opposes a numerical standard. Los Angeles County has already adopted the same numerical standard for unincorporated Los Angeles County areas. The current proposal before the Regional Board pertains to incorporated cities within Los Angeles County.

In their proposal for a numerical standard, Board staff has provided examples of successful BMP implementation in projects throughout the United States, including the San Francisco Bay area. Board staff has received authoritative presentations on engineering and hydrology standards and principles from the Water Environment Federation and the American Society of Civil Engineers to calculate the optimal rainfall retention amount, and has drawn from professional publications on proper BMP design and successful practices, including a national BMP database.

The guiding premise of Santa Monica's ordinance, and the proposed Regional Board requirements, is to focus on the reduction of runoff quantity, which will in turn result in concomitant pollutant reductions in the storm drain system. In terms of BMP effectiveness, much empirical data is available to aid in the design and maintenance of systems that maximize storm harvesting and infiltration. Reducing stormwater pollution through the intelligent planning and design of new construction, which is the objective of the City's ordinance, is the most cost-effective approach to reducing runoff and associated pollutants. Incorporating BMP systems into future development prevents the existing problem from getting worse by reducing future runoff and preventing increases in future costs to remediate the problem.

Budget/Financial Impact

No specific financial impact to the City is anticipated as a result of the City Council's support of a numerical standard for the SUSMPs.

Recommendation

Staff recommends that the City Council adopt the attached Resolution in support of the Los Angeles Regional Water Quality Control Board's effort to establish a numerical standard for stormwater runoff reductions from a parcel during a storm event.

Attachment: Resolution of the City Council of the City of Santa Monica in support of the LA Regional Water Quality Board efforts to establish a numerical standard

Prepared by: Craig Perkins, Director of Environmental & Public Works Management
Neal Shapiro, Urban Runoff Management Programs Coordinator

R0069166

EPWM:CP:NS:f/EPWM/ADMIN/Staffrpt/1-25-00/SUSMPS.doc
City Council Meeting 1-25-00

Resolution Number _____ (CCS)
(City Council Series)
Resolution of the City Council of the City of Santa Monica in Support of the Los Angeles Regional Water Quality Control Board to Establish a Numerical Standard for Stormwater Runoff Reduction in the Standard Urban Stormwater Mitigation Plan

WHEREAS, the City of Santa Monica has a Sustainable City program and a General Plan Conservation Element that promote long-term efficiency and environmental-responsibility in the use of all water resources, including urban runoff; and

WHEREAS, the City supports and encourages efforts to maximize the amount of rainfall and urban runoff put back into the ground and to minimize the runoff pollution that enters the ocean; and

WHEREAS, the City's Urban Runoff Pollution Control Ordinance requires a 20 percent reduction of total runoff for new development as well as significant reduction of total runoff from new parking lots and is working to reduce total runoff and pollutants entering the Santa Monica Bay; and

WHEREAS, numerous studies, design documents and a national database demonstrate BMP effectiveness and successes, including significant reductions in pollutants of concern; and

WHEREAS, a numerical standard, which includes all portions of a new development site including all roof areas and surface parking lots, is necessary in the Standard Urban Stormwater Mitigation Plans (SUSMPs) to ensure that a minimum baseline amount of runoff is captured for percolation, based on sound and widely accepted principles of hydrology; and

WHEREAS, the up-front amount spent on BMPs is a small percentage of total construction costs with region-wide benefits, and site-specific BMPs are more cost-effective than "end-of-the-pipe" mitigation and treatment; and

WHEREAS, each new development project must become part of the urban runoff solution and not continue to be part of the growing problem;

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF SANTA MONICA DOES HEREBY RESOLVE AS FOLLOWS:

SECTION 1. The City of Santa Monica is committed to restoring and preserving the health of the Santa Monica Bay, which is vital to the health of both residents and visitors.

SECTION 2. As an expression of this commitment, the City of Santa Monica hereby formally supports the Los Angeles Regional Water Quality Control Board efforts to establish a numerical standard for stormwater runoff reduction in the Standard Urban

Storm Water Mitigation Plan.

SECTION 3. The City of Santa Monica hereby formally supports the December 7, 1999, SUSMP Draft prepared by the Regional Board Executive Officer. The City opposes proposed amendments which would considerably weaken the requirements through the exclusion from the numerical standard of roof runoff and most surface parking lot runoff as well as delay full implementation of the requirements, all of which would dramatically compromise the goal of maximizing the amount of stormwater runoff diverted into the ground.

SECTION 4. The City Clerk shall certify to the adoption of this Resolution, and henceforth and thereafter the same shall be in full force and effect.

APPROVED AS TO FORM:

MARSHA JONES MOUTRIE
City Attorney

CITY OF SANTA MONICA CALIFORNIA

Administrative Services Division
Enviromental and Public Works
Management Department

1685 Main Street, P.O. Box 2200
Santa Monica, CA 90407-2200
(310) 458-8227 Fax (310) 576-3598

September 13, 1999

ATTN.: Xavier Swamikannu
LA Regional Water Quality Board
(213) 576-6640 fax

Xavier:

Sorry for the delay, but there was a communication mix up last Thursday and we were closed Friday.

If you can forward this to the members of the Board for their review, we would greatly appreciate it. If there is a better way to get this to the members, please let me know.

Thank you for all your assistance, sincerely,

Neal Shapiro
Acting Urban Runoff Management Programs Coordinator

100% RECYCLED PAPER

CITY OF SANTA MONICA CALIFORNIA

Administrative Services Division
Enviromental and Public Works
Management Department

1685 Main Street, P.O. Box 2200
Santa Monica, CA 90407-2200
(310) 458-8221 Fax (310) 576-3598

September 13, 1999

Dennis Dickerson
Xavier Swamikannu
LA Regional Water Quality Board

Dear Dennis Dickerson, Xavier Swamikannu

The City of Santa Monica supports the efforts of the Los Angeles Regional Water Quality Board to approve SUSMP measures that prescribe a set of BMPs for ANY new, retrofit or additional (on a pre-existing project) development in Los Angeles County. Specifically, the City of Santa Monica supports and encourages your efforts to maximize the amount of rainfall and urban runoff put back into the ground and to minimize how much runoff enters the ocean. The city believes that the sustainable and environmentally-responsible strategy is to prescribe a list of BMP options and prescribe that these measures, whether one or a combination of BMPs, be implemented to the maximum extent practicable at each new development project or site. The focus should be on the quantity of precipitation captured and infiltrated, not on the quality of the runoff entering receiving waters.

Moreover, the city does not agree with arguments of some city representatives that more studies are needed before the Board takes action. Specifically, the city disagrees that more studies are needed on the effectiveness of BMPs, on what is the measurable benefit of pollution concentration reduction of BMPs, on what is the optimal amount of precipitation capture per site, and on whether the cost of BMPs produces a greater benefit of pollution reduction and water quality improvement of receiving waters. These studies can occur concurrently, but should not prevent BMP use now. Numerous studies on BMP effectiveness and examples exist nationally and internationally – in the San Francisco Bay area, Texas, East Coast, Australia and Japan to name a few. The publications, ***Start at the Source*** and ***Design of Stormwater Filtering Systems***, document BMP successes and effectiveness, including pollution reduction percentages for some pollutants of concern.

The critical issue is that cities act to reduce runoff volume, and therefore reduce pollution. If runoff volume is not controlled, flooding and water supply problems will not be addressed. The Board needs to clearly and strongly state that BMPs should be for volume first and pollutants of concern incidentally. The primary issue is putting water back into the ground. Designers, planners and developers must be instructed to maximize what BMPs can accomplish within economic reason – minimize runoff, maximize harvest. On an individual

100% RECYCLED PAPER

development project basis, the amount spent on BMPs is most likely a small percentage of total construction costs. The benefits, however, are region-wide.

The debate amongst cities on whether a site can minimize a specific amount over consecutive storm events, or whether spending sums of money on BMPs will give significant results misses the goal – repairing the hydrologic cycle by connecting precipitation and infiltration. Each development project is different and is site-specific. Flexibility must be part of the system. Project developers and managers should not be forced to use BMPs if they will not be effective, vis-à-vis volume and cost, in which case in lieu minimization fees should be instituted by the cities for offsite BMP projects.

The City of Santa Monica encourages the Board to make a strong statement in the SUSMPs by approving language that prescribes the use of BMPs for each new development, with less regard for a performance standard in terms of rainfall captured. Each land use impacts the regional hydrologic cycle, and new development is part of the long-term solution.

Thank you for your continued efforts. If you have any questions, please contact Neal Shapiro, the acting Urban Runoff Management Programs Coordinator, (310) 458-8223.

Respectfully,

Craig Perkins, Director
Environmental & Public Works Management

CITY OF
SIMI VALLEY

2929 Tapo Canyon Road, Simi Valley, CA 93063-2199 • (805) 583-6700 • http://www.simivalley.org

January 26, 2000

California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: PROPOSED STANDARD URBAN STORM WATER MITIGATION PLAN
PUBLIC HEARING

Dear Board Members:

The purpose of this letter is to bring to your attention the impacts of the potentially restrictive procedures for the California Regional Water Quality Control Board's public hearing to consider the proposed Standard Urban Storm Water Mitigation Plan. Due to the changes in procedures implemented within the last few days, we feel that the Regional Board may not receive an adequate or weighted representation of the public's input on this matter.

Although we understand the desire to structure a process to receive public input within a limited time period, we are concerned that with the potentially large number of speakers with varying concerns on the issue, the Board may not hear adequate testimony from all the public, whether opposing or assenting. As such, we believe there is a potential for the process to produce an inaccurate picture by not allowing all interested parties to voice their concerns.

We request the Board conduct this process in a manner that enables a complete dialogue on this important issue.

Sincerely,

Mike Sedell
City Manager

cc: Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board, Los Angeles Region
Winston H. Hickox, Secretary
California Environmental Protection Agency

R0069173

BILL DAVIS
Mayor

PAUL MILLER
Mayor Pro Tem

BARBRA WILLIAMSON
Council Member

GLEN T. BECERRA
Council Member

STEVEN T. SOJKA
Council Member

City of South Gate

8650 CALIFORNIA AVENUE · SOUTH GATE, CA 90280-3075 · (213) 563-9537
FAX (213) 563-9572

FROM THE OFFICE OF
JAMES A. BIERY, P. E.
DIRECTOR OF PUBLIC WORKS
CITY ENGINEER

January 12, 2000

Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, California 90013

Proposed Standard Urban Stormwater Plans (SUSMP)

Dear Mr. Dickerson:

The City of South Gate has been requiring SUSMP Best Management Practices for "Planning Priority Projects" since early last year. South Gate's review process and requirement have been essentially identical to most of those contained with your proposed standards (see attached booklet-"Improving Stormwater Quality by Design"). As part of the City's program, developers have been allowed the choice of capturing the first 0.75 inch or rain or installing inserts in catch basins and area drains. Your clarification that mitigation includes either infiltration or treatment confirms that the City's NPDES program is proceeding on the correct path. Already having implemented this program, South Gate supports the Board's efforts to standardize and improve the SUSMP process.

As with any program of this magnitude, unanticipated problems may arise in the future and we trust that the Board's Executive Officer will continue to have the flexibility to work with municipalities to solve problems unique to individual cities. Examples of potential future difficulties include:

> The requirement to "Conserve Natural Areas." What constitutes adequate compliance will depend on whether your perspective is from the environmental or the building community. The available standards in references are too vague for effective implementation. Specific standards with clear, strong definitions are needed to aid in the implementation of this BMP. Without sufficient standards, this will be difficult to enforce on a consistent basis.
>
> From our experience, your section on Waivers which requires Board approval for individual projects with unique characteristics requesting exemptions may result in an overwhelming workload for Board staff.

This should be rewritten so that the Executive Officer can also authorize BMP modifications for an individual project or class of projects at the City level.

Currently the South Gate is requiring BMPs only for the specific area being modified at redevelopment projects unless the project valuation is over the pre-existing Public Works threshold of $30,000 in which case additional BMPs may be required for the entire site. This is consistent with the previous iteration of the SUSMP guidelines allowing cities to establish threshold criteria. There is no clear threshold mechanism in the proposed SUSMPs. We do not believe it is the Board's intent or even feasible to require a 10 acre site to undergo a full BMP retrofit if only a few square feet are being modified. A specific reasonable threshold should be established to trigger BMP retrofits (either a 50% valuation change or exceedance of an existing value-based threshold).

The City appreciates how difficult task of developing a workable program can be and will continue to work with the Board to overcome difficulties as we work together to reduce pollution in stormwater runoff..

Sincerely,

James A. Biery
Director of Public Works/City Engineer

City of South Gate

8650 CALIFORNIA AVENUE • SOUTH GATE, CA 90280-3075 • (323) 563-9502
FAX (323) 569-2678

ANDREW G. PASMANT
CITY MANAGER

August 26, 1999

Mr. Denis Dickerson, Executive Officer
CALIFORNIA REGIONAL QUALITY CONTROL BOARD
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Subject: The New Municipal NPDES Permit

Dear Mr. Dickerson:

Thank you for discussing the new permit for the municipalities at the July watershed meeting. The new permit and its potential impact on the cities' existing operations raised a few concerns.

The Countywide model programs have been the primary documents and guidelines for the cities to incorporate in their existing protocols for the current permit. The extensive process period for these models to be developed and approved has brought us to the second half of the permit implementation life span.

As an active Co-permittee and member of the Executive Advisory, Subcommittees and the Los Angeles River Watershed Committee, the City of South Gate has been involved with the challenging development process. Although the model programs have just recently been approved, the City had an interim plan at all times. This plan has always been parallel to the existing drafts of these models.

This process could have been more strenuous for the City if the County was not designated as the Principal Permittee. Although the individual cities are ultimately responsible for the implementation of the permit in their jurisdiction, Los Angeles County had established a base line for consistencies between the cities.

The annual fee and the Monitoring Plan elements were also part of the County's responsibilities. This eliminated a tremendous fiscal impact for cities.

The City of South Gate would like to request a Permit prescribing the county as the Principal Permittee with the City as a Co-permittee. The Board should consider the following benefits to the cities:

1. The annual cost will be paid by the County Flood Control, which is allocated by the cities.

2. The Monitoring Program will be conducted, evaluated and funded by the County as in previous years. (Cities can contribute if additional funding is necessary).
3. Consistency within the Los Angeles County cities will make implementation easier and more efficient.
4. The cities will benefit from the continuity of the Countywide Model program.

The new Permit should be written to address the following issues:

- Establish a more comprehensive monitoring program, which addresses pollutant(s) of concern (303d list) and TMDLs.
- Establish water quality standards in cooperation with the County.
- Evaluate the program to establish baseline date and effectiveness of the best management practices.

This will provide data and more technical expertise, as well as a solid foundation for the future development of the permit.

Whether the Board ultimately elects to group cities by SCAGG, COGG or by watershed, the County should continue as Principal Permittee. Grouping by watershed, which joins cities with common drainage areas, would make the most sense.

The City of South Gate recognizes the importance of the common goal of improving the environment and its dynamic process. We at the City hope the Board will consider the above-proposed process for development of the new permit.

Please call James Biery, Director of Public Works, at (323) 563-9537 if you have any questions.

Sincerely,

Andrew G. Pasmant
City Manager

AP/JB:lc
l-jb144

cc: Mayor H. Gonzalez
Vice Mayor H. De La Torre
Council Member B. De Witt
Council Member R. Moriel
Council Member X. Ruvalcaba

CITY COUNCIL

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Mayor

THOMAS A. YBARRA
Mayor Pro-Tem

Wm. "BILL" DAVIS
Councilman

H. "LARRY" GONZALES
Councilman

W. MICHAEL McCORMICK
Councilman

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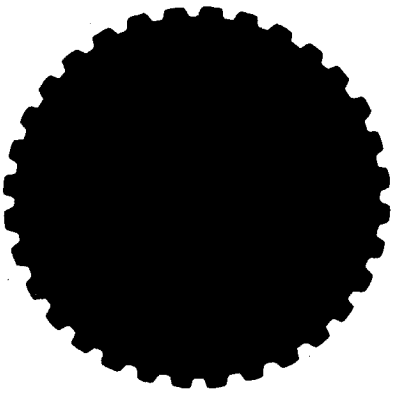

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January 14, 2000

RECEIVED
JAN 18 2000
BY:.....

VIA FACSIMILE AND
U.S. MAIL

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board
Los Angeles Region
101 Centre Plaza Drive
Monterey Park, CA 91754-2156

Dear Mr. Dickerson:

The City of Vernon has reviewed the Final Tentative Draft of the Standard Urban Storm Water Mitigation Plan (SUSMP) dated December 17, 1999. As you are aware the City of Vernon is one of eighty-five co-permittees involved in the Municipal Stormwater and Urban Runoff Permit issued under Board No. 96-054(NPDES No. CAS614001). The following are the City's comments to the SUSMP.

The Regional Water Quality Control Board is seeking to approve the SUSMP and incorporate the 0.75" numerical mitigation measure at its next meeting. The plan as drafted will require that millions of dollars be spent in order to implement the strategies outlined in the Mitigation Plan. The City of Vernon is concerned that sound technical studies have not been conducted prior to implementing Best Management Practices (BMPs). The BMPs have not been proven to effectively prevent further impairment of the beneficial uses of the receiving waters. Thus, the approval would be based upon inadequate evidence in the record.

The City of Vernon believes that a receiving water study should be performed to more effectively understand urban stormwater and anthropogenic impacts to the receiving water. The study would identify appropriate monitoring designs to assess stormwater discharges, receiving water impacts, and effectiveness of BMPs. Further, the study would identify which pollutants significantly impair the beneficial uses of the receiving waters. Until such studies are conducted it would be premature to implement BMPs that are targeted to remove pollutants without knowledge of their effect to the receiving waters. The City believes that millions of dollars should not be spent on BMPs that remove pollutants that may not impair the beneficial uses of the receiving waters. Finally, the study must include a baseline against which to measure the effectiveness of stormwater pollution mitigation programs.

The City of Vernon believes it is poor public policy to implement strategies without first determining that the requirements will have the intended results. The SUSMP outlines several BMPs to minimize the introduction of pollutants of concern to the storm water conveyance system. A recently released document from the Southern California Coastal Water Research Project reiterates this fact by stating in part "..Best Management Practices (BMPs) have been and still are, being applied without regard to whether the change in stormwater quality will have any meaningful impact on beneficial use protection. Stormwater managers need to know which BMPs are effective at reducing loads and concentrations for individual constituents. Next, managers need to assess what the most efficient use of BMPs within their watersheds will be whereby the greatest improvement in stormwater quality is achieved at the most reasonable cost. Finally, there will need to be an evaluation if these expenditures on BMPs and improvement in stormwater quality will promote beneficial use protection.."

Until a thorough study is completed on the effectiveness of the BMPs, implementation of them could cost developers millions of dollars on controls that do not protect the beneficial uses of the receiving waters.

Additionally Section 3 of the SUSMP requires that a development must be designed so as to minimize, to maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts generated from site runoff. The Board has defined pollutants of concern. However a determination has not been made as to what concentrations of pollutants produce a significant impact to beneficial uses, or what the

maximum extent practical means. Without a comprehensive study to define these items the permittee has no guideline to determine if the proposed BMP is adequate or cost effective.

The Clean Water Act and the Porter Cologn Water Quality Act are designed to protect the beneficial uses of the receiving water. Nevertheless, the imposition of mandatory treatment, regardless of pollutant loadings, is inconsistent with these acts. Vernon also believes that these Acts require that a cost benefit analysis be conducted prior to imposing mandatory requirements.

It appears that the SUSMP was revised to incorporate mainly comments from the environmental community. On the other hand, the comments of public agencies, such as the City of Vernon, were, for the most part, disregarded.

The SUSMP has been amended to include two additional categories into the discretionary projects. The SUSMP now includes parking lots of 5,000 square feet or more. The addition of small parking lots virtually requires the SUSMP to be applied to all development projects which require discretionary approval. The cost for the implementation of BMPs for such small parcels may make such parcels non-developable. The requirement of legal agreements or covenants will also bring the streamlined permit process that most cities strive for to a standstill.

The City of Vernon, like most cities in Los Angeles County, is virtually built out. Most new developments that are constructed within Vernon are infill projects or redevelopment of existing sites. The infrastructure is virtually complete. The hydrology and hydraulic calculations that were performed for the design of the storm drain pipeline systems were based on a certain time of concentration. Any changes to this time of concentration could potentially cause flooding. Additionally, certain BMPs require direct connections into the storm drain pipeline system. The vast majority of sites do not have storm drain pipes within their street frontage. These pipeline systems, in most cases, cannot be extended, making these BMPs impractical. In such cases, if a numerical mitigation measure of 0.75" is incorporated into the SUSMP, there may not be enough space available to implement BMPs that will meet SUSMP criteria.

The SUSMP also contains a section on alternative certification for storm water treatment mitigation. In order to sign a certification that the plan meets criteria established in the SUSMP, the professional signing the plan must attend training

on the design of BMPs. The training must be approved by the Regional Board Executive Officer. The City agrees that training is appropriate. However, we are concerned that it may take many years before appropriate curriculum is developed and the required number of professionals are trained in order to meet the construction industry demand. This will only serve to slow development within our community and could have a potentially detrimental effect on the regional economy.

Finally, the City disagrees with the methodology used to determine the amount of rainfall to be treated. No scientific study has been produced that accurately depicts the pollutant runoff from a site. How was it determined that the 85th percentile of a runoff event contains a concentration of a pollutant of concern that will significantly impact the environment and not the 86th percentile? Until such a comprehensive study is conducted the design of BMPs are flawed and not supported by substantial evidence in the record. Again, BMPs as proposed by the Board may not produce the appropriate cost benefit ratio to warrant such a requirement.

The City of Vernon has previously submitted comments on the proposed SUSMP. Many of those comments are still applicable. In order to avoid repetition, and in order to assure that Vernon does not unintentionally waive any issue previously raised, all comments previously raised by Vernon are hereby incorporated by reference.

The City of Vernon appreciates the opportunity to comment on the SUSWMP. We are committed to working with your staff to reduce pollutants in storm water. However, we must emphasize that sound scientific studies should be completed prior to implementing the SUSMP.

Very truly yours,

Samuel Kevin Wilson, P.E.
Director of Community Services & Water

SKW:mc
Enclosure

Water.Brd\SUSMP.COM

CITY COUNCIL

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Councilman

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Councilman

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September 8, 1999

Mr. Dennis Dickerson
Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standardized Urban Stormwater Mitigation Plans

Dear Mr. Dickerson,

We have reviewed the amendments that Regional Board staff proposes to add to the Standardized Urban Stormwater Mitigation Plans (SUSMPs) that were submitted by the County of Los Angeles on behalf of the 85 cities participating in the LA County Municipal Stormwater Permit. These amendments are related to treatment controls and numerical mitigation measures. We oppose the inclusion of these amendments.

The intent of the Clean Water Act is to prevent the degradation of the beneficial uses of the receiving waters of the watershed. There is no credible evidence to show that the treatment control Best Management Practices (BMPs) proposed in the amendment to the SUSMPs will improve the beneficial uses of the receiving waters. Not only is there insufficient data on exactly which pollutants are causing impairments in the beneficial uses of the receiving waters, we are aware of no scientific study on the real world effectiveness of many of the approved BMPs. It is inappropriate to blindly mandate the use of costly structural treatment systems without properly identifying the cost benefit of these systems.

Numerical mitigation measures, in the form of required rainfall capture standards, have no basis in the actual preservation of the beneficial uses of receiving waters. These numerical standards are derived from hydraulic standards used in storm drain design and are unrelated to actual pollutant loads. There is no evidence to suggest that processing 85% of stormwater runoff through some sort of treatment BMP will result in a quantifiable reduction in the impairment of the beneficial uses of the receiving waters. As noted above, the treatment control BMPs offered in the SUSMPs have not been shown to be effective in any meaningful way.

We are not alone in this opinion. A recently released document from the Southern California Coastal Water Research Project (SCCWRP) reiterates our position by stating:

> *Best Management Practices (BMPs) have been, and still are, being applied without regard to whether the change in stormwater quality will have any meaningful impact on beneficial use protection. Stormwater managers need to know which BMPs are effective at reducing loads and concentrations for individual constituents. Next, managers need to assess what the most efficient use of BMPs within their watersheds will be whereby the greatest improvement in stormwater quality is achieved at the most reasonable cost. Finally, there will need to be an evaluation if these expenditures on BMPs and improvement in stormwater quality will promote beneficial use protection.*

The notice of public hearing infers on page 2 that numerical mitigation measures are intended to "..facilitate the development of BMP design criteria." This statement indicates that your agency understands that the BMPs offered have not been sufficiently developed with regard to design details, not to mention effectiveness issues. For instance, by placing a requirement for 0.75 inch of stormwater in a 24-hour period to be treated, the developer is faced with insufficient information upon which to base a design. Should the treatment facility be sized for the full volume of water averaged over the entire 24 hour period or should the facility be sized to accommodate the entire 0.75 inch over a one or two hour period? How will the variation in flow rates affect the efficacy of the BMP? Since the exact pollutants of concern have not been identified, how will a developer know what contaminants are required to be removed from the runoff?

Further, the requirement of treatment control BMPs on non-industrial sites is inconsistent with the Regional Board's lack of such requirement for sites covered under the General Industrial stormwater permit. Why should a small restaurant be held to a higher standard than a large industrial facility?

In short, it is improper to mandate the use of treatment control BMPs without first identifying the cost benefits of these requirements. We have no problem in mandating source control and other proven structural BMPs, such as spill containment and covering trash areas. However, the proposed amendments to the SUSMPs are unacceptable.

We should instead heed the thoughtful advice from SCCWRP and study the actual pollutants of concern that affect the beneficial uses of the receiving waters. We are all in favor of reducing pollutants in stormwater; the challenge is to do so without causing undue economic disruption. Our policies must not only be effective in an environmental sense, they must also provide the greatest environmental benefit at the lowest cost. To some, these competing aims seem to be impossible to reconcile. However, with a sound scientific approach, we can define the problem in such a way that we can achieve the greatest environmental benefit possible with the limited finds available.

If you have any questions please call me at 323-583-8811.

Very truly yours,

Samuel Kevin Wilson, P.E., L.S.
Director of Community Services and Water

cc: City Attorney

es Department
ng Division

RECEIVED
2000 JAN 13 P 1:31
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

January 11, 2000

Mr. Dennis Dickerson, Executor Director
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

RE: STANDARD UBAN STORM WATER MITIGATION PLAN

Dear Mr. Dickerson:

We have reviewed the proposed Standard Urban Storm Water Mitigation Plan as revised and dated December 7, 1999 and have comments on the plan. Rather than provide you with a separate compilation of comments, we refer you to the attached letter, which was sent to you on January 5, 2000 from Rufus C. Young, Jr. of Burke, Williams & Sorensen, LLP. Our comments generally conform to those contained in that letter.

If you have any questions on this matter, please contact me at (626) 814-8422.

Sincerely,

Jeffrey W. Collier
Public Services Director

JWC:TMM:ct:Doc2000-503

R0069185

CITY OF WEST HOLLYWOOD

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JEFFREY PRANG
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SAL GUARRIELLO
Councilmember

PAUL KORETZ
Councilmember

STEVE MARTIN
Councilmember

January 25, 2000

Dennis Dickerson, Executive Director
Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

I am proud to share with you the news that the City Council of the City of West Hollywood recently passed a resolution I authored that supports design standards that reduce runoff from new and redevelopment sites and city property in the City of West Hollywood.

The City of West Hollywood has always been at the forefront of protecting the environment. The adopted standards require water quality treatment or infiltration onsite of 100% of the runoff generated by the first three-quarters of an inch of rain to prevent polluted runoff from traveling to the ocean. These standards were developed with help and support from Heal the Bay, an environmental organization dedicated to making Southern California's coastal waters safe for people and marine life.

I encourage all Southern California cities to adopt these environmentally sound standards. Our City has taken the lead in the battle to reduce urban runoff. It is now time for the incorporated portions of Los Angeles County to adopt these standards so that all cities in the county will conform to the standards that significantly reduce urban runoff.

If you have any questions please feel free to contact my deputy Scott Svonkin at (323) 848-6315.

Sincerely,

Paul Koretz
Councilmember

- If approved, the numeric limits would require cities to impose upon 7 types of new developments costly structural controls (infiltration/detention basins or similar devices, oil/water separators, vegetative swales, catch basin inserts, pervious materials, or a combination thereof). These controls will be imposed without reason if they are needed or if they would be effective or necessary for protecting a beneficial use of receiving water.

- The structural controls required to meet a numeric retention/treatment limit would require a high degree of maintenance, which cities would be responsible for enforcing and if not properly maintained, could become sources of pollution rather than mitigating pollution.

- The numeric limits constitute a state mandate that is not funded and has not been evaluated for cost-effectiveness as required under California law.

- The numeric limits now being considered were not based on science or engineering, but on a negotiated agreement, and are therefore arbitrary.

- The structural controls necessitated by numeric limits would be required without regard to siting factors (soil conditions and other environmental considerations).

- The use of some structural controls such as detention basins/ponds and vegetative buffers are even more undesirable because they reduce the amount of developable area.

- Cities and developers have little experience in the use of detention/treatment structural controls. The fact that the SUSMP would require their immediate imposition may impose a danger that such controls could be mis-prescribed, as has happened in other parts of the country.

The NPDES municipal permit Executive Advisory Committee (EAC) has also taken a position against numeric limits.

The City is aware that the regional board is under pressure to approve the Standard Urban Storm Water Mitigation Plans because the permit required approval by July 30, 1999. Since there are problems associated with numeric limits, their absence in the SUSMPs would be in the best interest of the City of Whittier and other cities. This subject matter could be reopened for evaluation during the discussion of the next municipal NPDES.

In the future, regional board staff should provide cities sufficient time to allow the Council of Governments (COG) to review and comment on NPDES permit issues with a significant cost impact. The COG meets monthly and 30 days notice is not enough time for member cities to take action on such important issues. As you know, this was an issue raised by the City of Long Beach in its writ of mandate complaint against the regional board.

And as you may also be aware, two years ago the Southern California Association of Governments (SCAG) petitioned the State Water Resources Control Board to involve it and its sub-regional COG in the discussion of NPDES permit matters. This action was taken because storm water management is an important regional planning issue that demands the involvement of SCAG.

Sincerely,

J. Greg Nordbak
Mayor, City of Whittier

JGN:GN
(Admin: LARWQCB – Standard Urban Stormwater Mitigation Plan)

City of Whittier

13230 Penn Street, Whittier, California 90602-1772
(562) 464-3301

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September 14, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 W. 4th Street Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

Subject: Standard Urban Stormwater Mitigation Plan

The City of Whittier (City) is concerned that the regional board will be considering incorporating numeric limits into the Standard Urban Stormwater Mitigation Plan (SUSMP) at its September 16, 1999 meeting. The numeric limits proposed by regional board staff are aimed at retaining and/or treating .75" of storm water during a 24-hour storm event from seven (7) categories of new developments. The City opposes numeric limits for the following reasons:

- The NPDES permit contains no language that requires cities to retain/treat any volume of storm water runoff from new developments.

- No other municipal permit in California requires a numeric limit for the retention or treatment of storm water runoff.

- Although other counties in California, such as Alameda and Ventura, require post-construction controls for new developments, they also allow cities broad discretion in determining which types of projects and structural controls to impose on developers.

- Although the City of Santa Monica has required numeric limits on retaining/treating storm water runoff through rigid runoff coefficients, its experience with developers has proven that such requirements are difficult to meet.

R0069189

STANDARD URBAN STORMWATER MITIGATION PLAN

ADMINISTRATIVE RECORD

VOLUME 6

Administrative Record: SWRCB/OCC Files A-1280, A-1280(a), A-1280 (b)

VOLUME 06

Doc. No.	Item	Date	Document
	1	04/02/99	Alameda County Urban Runoff Clean Water Program- Stormwater Inlet Insert Devices Literature Review
	2	01/20/00	California Coastal Commission- State of California Resources Agency
	3	01/10/00	California Coastal Commission- State of California Resources Agency
	4	12/17/99	California Regional Water Quality Control Board Los Angeles Region
	5	12/07/99	California Regional Water Quality Control Board Los Angeles Region
	6	01/14/00	California Stormwater Quality Task Force
	7	01/11/00	Center for Watershed Protection
	8	09/15/99	County of Los Angeles Board of Supervisors
	9	01/11/00	County of Los Angeles Department of Public Works
	10	12/28/99	County of Los Angeles Department of Public Works
	11	08/12/99	County of Los Angeles Department of Public Works
	12	07/21/99	County of Los Angeles Department of Public Works
	13	07/12/00	County of Los Angeles Department of Public Works
	14	06/17/99	County of Los Angeles Department of Public Works
	15	01/17/00	County of Ventura Public Works Agency- Email regarding comment letter on SUSMP
	16	01/14/00	County of Ventura Public Works
	17	08/11/99	Los Angeles County Urban Runoff and Stormwater NPDES Permit Standard Urban Stormwater Mitigation Plan
	18	09/15/99	San Gabriel Basin Water Master
	19	09/14/99	San Gabriel Basin Water Quality Authority
	20	12/16/99	San Gabriel Valley Council of Governments
	21	12/16/99	Santa Monica Mountain Conservancy State of California Resources Agency
	22	12/20/99	South Bay Cities Council of Governments
	23	01/21/00	Southern California Association of Governments
	24	01/18/00	Southern California Association of Governments- Meeting of the Water Quality Task Force
	25	01/06/00	Southern California Association of Governments
	26	12/14/99	Southern California Association of Governments
	27	10/19/99	Southern California Association of Governments- Meeting of the Water Quality Task Force
	28	01/13/00	USEPA- Region IX
	29	01/14/00	Ventura Countywide Stormwater Quality Management Program
	30	09/13/99	Ventura Countywide Stormwater Quality Management Program

DRAFT REPORT

STORMWATER INLET INSERT DEVICES LITERATURE REVIEW

Prepared for
Alameda County Urban Runoff Clean Water Program
951 Turner Court
Hayward, CA 94545

April 2, 1999

URS Greiner Woodward Clyde
500 12th Street, Suite 200
Oakland, CA 94607

941020ND

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All known manufacturer/vendors of inlet insert devices were contacted by telephone and/or fax and asked for information on cost and effectiveness of their devices. The nature of this literature review was explained to the vendors and any possible leads for scientific studies were requested. All leads were followed up with phone calls. In addition, all readily available stormwater BMP studies and databases were reviewed for relevance. The manufacturers used in this review, and the contact names and phone numbers are given in Table 1. A complete list of the material reviewed is included in the last section of this report.

Table 1. Manufacturer/Vendor Contacts

Manufacturer	Contact	Phone Number
AbTech Industries	Lynne L'Esperance	800 545-8999
Aqua Treatment Systems	Paul Geisert	206 343-5221
Best Management Technologies	Rod Butler	888 237-8648
Builders Environmental Marketing	Jon Dougal	510 532-8554
Enviro-Drain	Jim Hutter	800 820-1953
EP International	Udo Jaehrling	305 892-0325
Foss Environmental Services	John Macpherson	206 768-1451
KriStar Enterprises	Rebecca Eccles	800 579-8819
Revel Environmental Marketing	Kevin Chandler	510 706-8115

R0069194

In this section the construction and target pollutants for each unit are described, the manufacturer claims and the available supporting evidence are outlined, the scientific studies and their findings are summarized, and the estimated costs for each unit are given.

3.1 CONSTRUCTION AND TARGET POLLUTANTS

The construction of the devices reviewed are summarized below. Several of the devices are similar in their construction and are grouped together in the following discussion.

3.1.1 Bag Filter Inserts

The StreamGuard (Foss Environmental) and the Storm Watch (Builders Environmental Marketing) consist of a geotextile bag with an adapter fabric (called skirt or boot depending on the manufacturer). The bag is inserted in the catch basin, and the adapter fabric is placed under the grate to direct the stormwater into the insert. The geotextile bag absorbs oil and retains sediment, as it flows through the insert. Floating oil and grease are also absorbed by the media, and sediment is collected in the bottom. The StreamGuard offers three types of inserts: for oil and sediments (with oil-absorbent polypropylene filters in the bottom), for sediment only, and for floatables and debris. The Storm Watch offers oil and sediment, and sediment only inserts. The Gullywasher Geotextile Catch Basin Insert (Aqua Treatment Systems) has the same mechanism of pollutant removal as the StreamGuard and Storm Watch, but is supported by a stainless steel funnel. The bag can be removed, emptied and/or backflushed, and reinstalled. Units are available for oil and sediment, and for sediment only control (Figure 1).

Ultra-Urban Filter with OARS OnBoard (AbTech Industries) units consist of OARS polymer oil-sorbing filter media packaged into filter canisters, bags, blankets, or booms that are deployed in catch basins. Stormwater flows through the unit, coming into contact with the oil sorbing media. The units can also be equipped with a basket for capturing sediment and debris (Figure 1).

3.1.2 Basket Filter Inserts

The Gullywasher basket (Aqua Treatment Systems), Fossil Filter (KriStar Enterprises) and the SIFT Filter (Revel Environmental Marketing), units consist of various configurations of a basket filled with a single filter media (Figure 2). The Gullywasher baskets are available with oil-absorbent pillows constructed of either an oil-selective polymer or a cellulose filter media, screens, and bag filters for sediment soil and debris, or specialty media for site specific pollutants. The Fossil Filter is available with alumina silicate filter media and/or with a silt basin and a heavy metals filter skirt. The SIFT Filter is available with alumina silicate filter media. In each case, the unit is suspended below the inlet by a support frame, which also directs water into the filter basket. The water passes through the filter media before being discharged.

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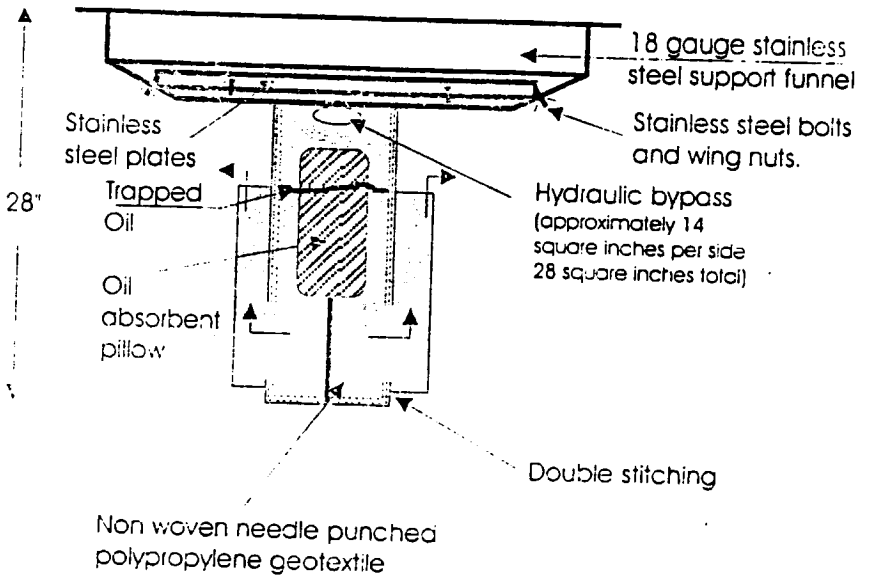
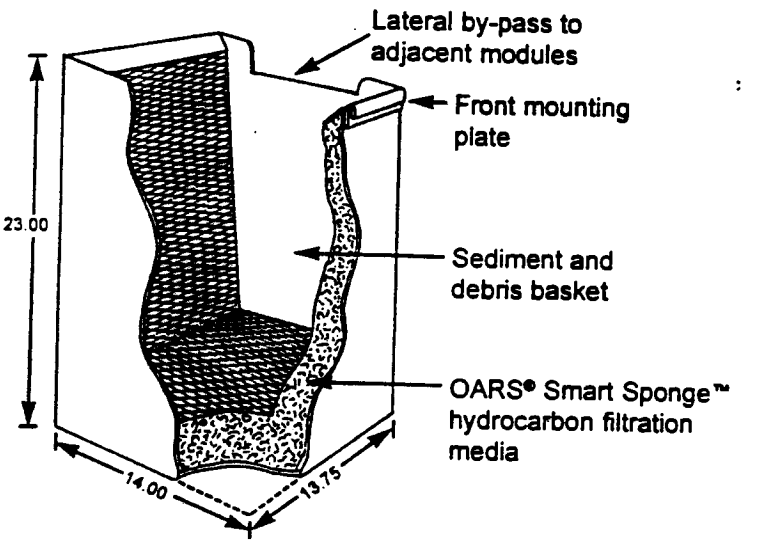
3.1.3 Tray Filter Inserts

The Enviro-Drain (Enviro-Drain) is a multi-tray inlet insert, which is available in a variety of configurations (Figure 3). Up to four trays filled with various filter media can be stacked on top of each other. The stormwater flows through the filters, and is discharged through the bottom. Typically the top tray is screened to capture large material while subsequent trays may hold

Absorbent W, a wood fiber filter material intended to remove hydrocarbons; or activated carbon, intended to "neutralize fertilizers, pesticides and trap sediments and heavy metals" (Enviro-Drain literature).



(a) Aqua Treatment Systems Gullywasher Geotextile Catch Basin Insert



(b) AbTech Industries Ultra-Urban Filter with OARS OnBoard

Figure 1. Bag Filter Inserts

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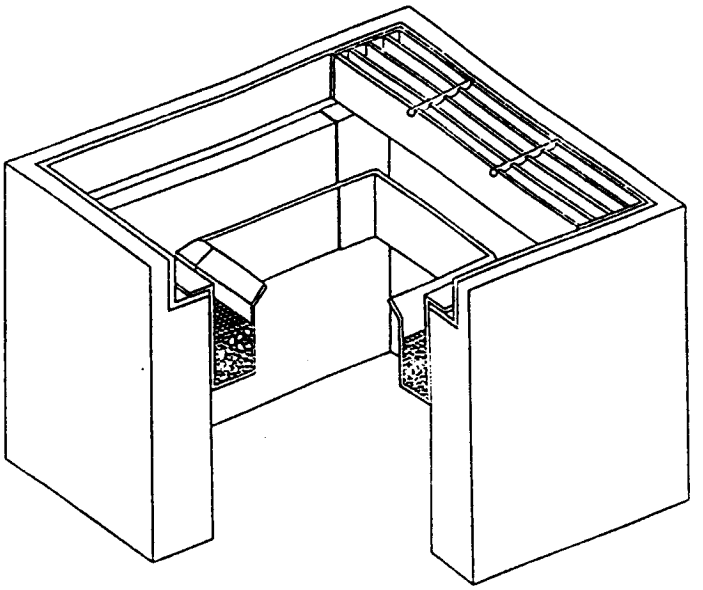

Figure 2. Basket Filter Inserts -- KriStar Enterprises Fossil Filter

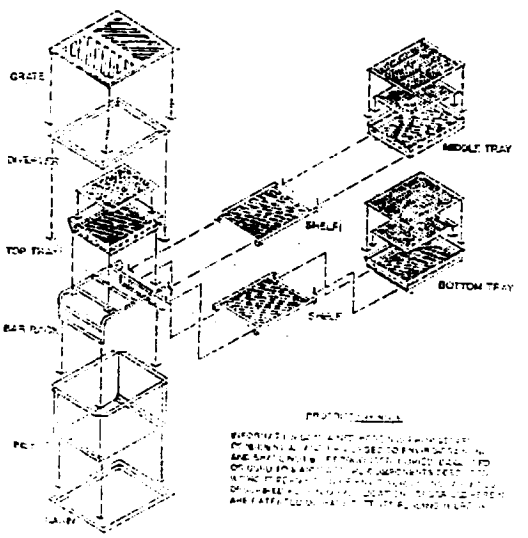

Figure 3. Tray Filter Inserts -- Enviro-Drain

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3.1.4 Cartridge Inserts

The Hydro-Cartridge (EP International) is a bi-directional fiberplastic cartridge which is available with or without oil-sorbing polymer fill pads (Figure 4). Stormwater is funneled into the center of cartridge and is forced up in both sides of the funnel once it reaches the bottom of the cartridge. Water flows out through the two side openings, where it spills out into the catch basin.

The BMT Storm Clenz Filter is an industrial plastic cartridge with cellulose filter media attached by stainless steel quick release clamps. As water enters the unit, sediment settles in the cartridge, and floating petroleum products are captured by the cellulose media.

The unit construction and target pollutants for each device are summarized in Table 2.

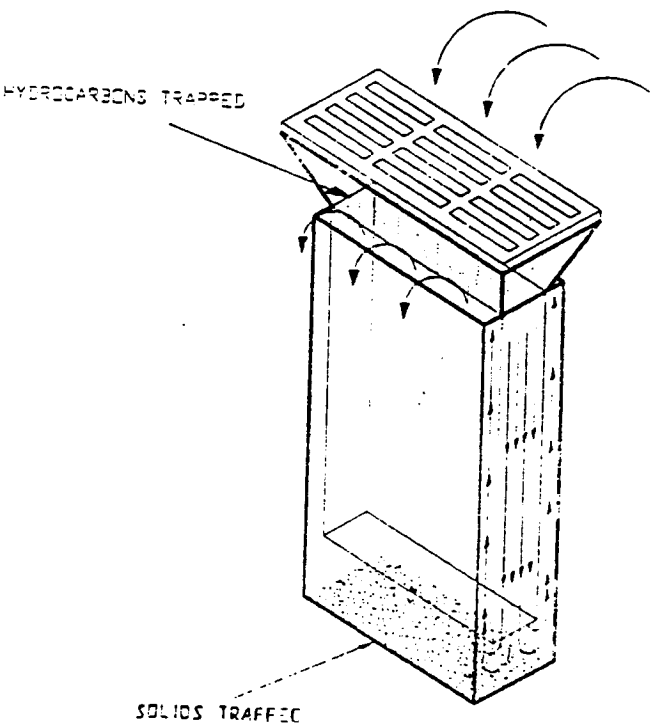

Figure 4. Cartridge Filter Insert -- EP International Hydro-Cartridge

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Table 2. Construction and Target Pollutants of Inlet Insert Devices

Device	Manufacturer	Construction	Target Pollutants
BMT Storm Clenz Filter	Best Management Technologies	Industrial plastic cartridge with cellulose filter media.	Sediment and petroleum hydrocarbons
Enviro-Drain	Enviro-Drain	Multi-tray stainless steel unit available with or without oil-sorbing wood fiber filter material (Absorbent W™) and/or activated carbon.	Petroleum hydrocarbons, and/or other organics, and/or sediments, and/or heavy metals and/or fertilizers and pesticides and/or debris
Fossil Filter	KriStar Enterprises	Plastic filter troughs containing alumina silicate. Also available with silt basin and heavy metal filter skirt.	Petroleum hydrocarbons and/or silt and debris and/or heavy metals
Gullywasher basket	Aqua Treatment Systems	Vinyl-coated wire catch basin inserts available with different filter media, including oil selective polymer or cellulose, and specific pollutant filters.	Petroleum hydrocarbons and/or sediments and/or debris
Gullywasher geotextile bag	Aqua Treatment Systems	A geotextile bag inserted in the catch basin and supported by a stainless steel funnel. Available with or without oil absorbent pillow.	Sediments and/or petroleum hydrocarbons
Hydro-Cartridge	EP International	Bi-directional cartridge available with or without oil-sorbing polymer fill pads (Rubberizer™).	Sediment and petroleum hydrocarbons
SIFT Filter	Revel Environmental Marketing	Galvanized zinc-coated frame with alumina silicate filter material (XSORB® Select).	Petroleum hydrocarbons
Storm Watch	Builders Environmental Marketing	A geotextile bag inserted in the catch basin and supported by an adapter fabric. Available with or without oil sorbent filter pack.	Sediment and/or petroleum hydrocarbons
StreamGuard	Foss Environmental Services	A mesh or geotextile bag inserted in the catch basin and supported by an adapter fabric. Available with or without oil absorbent pillow.	Petroleum hydrocarbons, and/or sediments, or trash and debris
Ultra-Urban Filter with OARS OnBoard	AbTech Industries	Filter canisters, bags, blankets, or booms containing oil-sorbing material, available with sediment and debris basket.	Petroleum hydrocarbons and/or sediments and debris

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3.2 MANUFACTURER CLAIMS

Some manufacturers make specific claims for their products in marketing literature which range from vague (*i.e.*, "will trap sediment and remove some oil from water") to specific (*i.e.*, "can effectively eliminate 99.4% of contamination by oil and all other petroleum-based products"). In many cases these claims are not substantiated by readily available material. Manufacturer claims and supporting material are summarized in Table 3.

In no case were specific claims substantiated by adequate available supporting documentation. A demonstration of OARS appeared to remove free product, however, no laboratory reports were available which quantified the efficiency of this removal process. In addition, what little information could be gleaned about how manufacturer tests were carried out did not indicate that tests replicated the conditions likely to be found in actual installations. Therefore, manufacturer claims were not used to evaluate removal efficiencies for any inlet insert device.

Table 3. Manufacturer Claims and Supporting Material

Device	Manufacturer	Manufacturer Claims	Supporting Material
BMT Storm Clenz Filter	Best Management Technologies	"It is capable of absorbing five times its weight in hydrocarbons"	No additional information was available.
Enviro-Drain	Enviro-Drain	"Pollution Removal Rate: Up to 97%"	A lab report without quality control data was obtained, however, the study description was not available.
Fossil Filter	KriStar Enterprises	"Removes oil and grease from water flow entering the drain"	A lab report which indicates 55.0% and 53.6% removal of oil and grease at "low" and "high" concentrations respectively.
Gullywasher basket	Aqua Treatment Systems	No specific claims.	
Gullywasher geotextile bag	Aqua Treatment Systems	No specific claims.	
Hydro-Cartridge	EP International	"Over 90% pollution control" based on letter from G.M. Selby & Associates to Geotechnical Marine Corporation.	The lab report used to make this judgment was not available.
SIFT Filter	Revel Environmental Marketing	"Can effectively eliminate 99.4% of contamination by oil and all other petroleum-based products" based on a lab report.	A lab report without quality control data was obtained; however, the study description was not available.
Storm Watch	Builders Environmental Marketing	"Will trap sediment and remove some oil from water"	This statement appears to be based on lab data for Foss StreamGuard unit, which is similar in construction.
StreamGuard	Foss Environmental Services	Test summaries indicate removal efficiencies of 68% to 82.5% for oil and grease, and 99.6% for total solids.	Test was part of a pilot scale study. The original laboratory reports were not available.
Ultra-Urban Filter with OARS OnBoard	AbTech Industries	"Absorbs and locks up hydrocarbons floating on the water surface" based on studies using free product. "Oil and grease removal ranged from 78 % to 87%, averaging 83%"	Removal of free product from water was observed in demo. Technical notes on four studies were provided, including a summary of the methodology and results. Original laboratory reports were not available.

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3.3 SCIENTIFIC STUDIES

Only four complete scientific studies which evaluated the effectiveness of specific inlet insert devices were unearthed. Scientific studies for each device are referenced in Table 4.

Table 4. Scientific Studies of Inlet Insert Devices

Device	Manufacturer	Studies/ Laboratory Tests[1]
BMT Storm Clenz Filter	Best Management Technologies	None
Enviro-Drain	Enviro-Drain	WCC, 1996 and ICBIC, 1995.
Fossil Filter	KriStar Enterprises	LWA, 1998. Similar filter media tested by WCC, UCLA, and Psomas & Associates, 1998.
Gullywasher basket	Aqua Treatment Systems	WCC, 1996 and ICBIC, 1995.
Gullywasher geotextile bag	Aqua Treatment Systems	None
Hydro-Cartridge	EP International	None
OARS filter media	AbTech Industries	WCC, UCLA, and Psomas & Associates, 1998.
SIFT Filter	Revel Environmental Marketing	None. Similar filer media tested by WCC, UCLA, and Psomas & Associates, 1998.
Storm Watch	Builders Environmental Marketing	Similar to StreamGuard device.
StreamGuard	Foss Environmental Services	WCC, 1996 and ICBIC, 1995.

1. WCC - Woodward Clyde Consultants
   ICBIC - Interagency Catch Basin Insert Committee
   LWA - Larry Walker Associates
   UCLA - University of California, Los Angeles

The Gullywasher basket (Aqua Treatment Systems), StreamGuard (Foss Environmental), and the Enviro-Drain (Enviro-Drain) units were compared in two studies completed by ICBIC (1995), and WCC (1996). The Storm Watch insert is similar to the StreamGuard insert, however, it has not been specifically tested. A study of the Fossil Filter unit (KriStar Enterprises) was recently completed by LWA (1998). Several catch basin retrofits were compared in a study recently completed by WCC, UCLA, and Psomas & Associates (1998). This study includes tests of the OARS unit (AbTech Industries) and tests of an alumina silicate filter media, similar to the filter media used in the Fossil Filter (KriStar Enterprises) and SIFT filter (Revel Environmental marketing) units. The results of these four studies are summarized and compared below in the following text and in Table 5.

3.3.1 Evaluation of Commercially-Available Catch Basin Inserts for the Treatment of Stormwater Runoff from Developed Sites, ICBIC, 1995

- Study Design: Inlet inserts were bench-tested in new condition. Then the units were installed in the field and subjected to a real-life conditioning period, after which they were removed from the field for follow up bench testing. The devices drained areas ranging from 0.30 to 0.73 acres. The study also included analyses of the weight and material captured in the inserts while installed in the field.
- Sediment: With inflow TSS concentrations ranging from 52 mg/L to 157 mg/L the inserts tested generally did not reduce the concentration of fine sediment (less than 60 μm in diameter) by more than 20 mg/L. The Enviro-Drain unit had TSS reductions ranging from -25% (influent TSS 114 mg/L) to +28% (influent TSS 140 mg/L). The Gullywasher had TSS reductions ranging from -41% (influent TSS 52 mg/L) to +15% (influent TSS 130 mg/L). The StreamGuard had TSS reductions ranging from -15% (influent TSS 110 mg/L) to +25% (influent TSS 86 mg/L). Although the study was not designed to evaluate removal of coarse sediment, visual observations and particle size distributions indicate that inserts do in fact capture these materials. The ability of the inserts to retain trapped sediment appears to be compromised by washout of previously trapped sediment.
- Petroleum Hydrocarbons: The inserts varied in their ability to remove petroleum hydrocarbons. Removal rates for inserts in new condition ranged from 30% to 90% when exposed to oil concentrations near the high end for urban runoff (34-85 mg/L). For most configurations tested, performance dropped off rapidly with use. The StreamGuard unit was able to reduce oil and grease concentrations below 10 mg/L when new, however, the overall removal may be less than observed in the bench tests because it appears that oil previously captured gravitationally is washed out during subsequent large storms. The Enviro-Drain unit provided some oil and grease removal when in new condition but was unable to reduce concentrations to below 10 mg/L. The Gullywasher basket units maintained a removal capacity of around 35% for oil and grease concentrations ranging from 34 mg/L to 85 mg/L.
- Metals: There was no discernible removal of the total or dissolved fraction of copper, lead, and zinc in any of the units studied.
- Maintenance: The maintenance cycle was limited more by clogging of the filter surface or screens than by actual oil saturation of the absorbent. Units configured for sediment and debris removal may need to be cleaned more frequently than once every three months. Using a target efficiency of 50% removal, and an effluent objective of 10 mg/L of oil and grease, the maintenance interval for these devices ranged from after nearly every rainfall event (1/2 to 3/4 inch) to after five or more inches of rain. Wood fiber absorbent contributed to the blinding of the screen. In addition, wood fiber becomes saturated and decomposes limiting the field life to one or two months.

R0069203

3.3.2 Parking Lot Monitoring Report, WCC, 1996

- Study Design: Inlet inserts were installed in storm drain inlets in a parking lot. The devices drained areas that ranged from 0.34 to 2.50 acres. Stormwater runoff and outlet samples were collected onsite. Water that bypassed the filter was also collected.
- Sediment: A substantial amount of overflow from the inlet filters was observed by field crews during the first storm sampling event. After the storm, the inlet filters were clogged with fine sediments, leaves, and pine needles. As a result, it is unclear how much of the runoff was actually treated by the inlet filters.
- Petroleum Hydrocarbons: The filters appeared to be effective at removing hydrocarbons from the stormwater, however, the post-inlet sampling method may have artificially reduced the hydrocarbon concentrations found. All observed concentrations, both inlet and outlet were less than 10 mg/L for TPH.
- Metals: Total concentrations of copper, lead, and zinc were higher after passing through the inlet insert devices tested for the first storm event with one exception (lead concentration decreased 10% in the Enviro-Drain unit). In the second storm event concentrations of copper, lead, and zinc decreased by 7%, 75%, and -9% respectively. Dissolved concentrations of copper, lead, and zinc were the same or higher after passing through the inlet insert devices tested for both storm events. The sample size (two events) is too small to draw any conclusions regarding these data.
- Maintenance: Observations suggest that clogging and subsequent bypassing significantly limit the effectiveness of the units in removing metals. Overall, however, the problems with clogging and resultant flooding indicate that these filters did not perform well as tested, limiting the overall effectiveness of the units for these purposes.

3.3.3 NDMP Inlet/In-line Control Measure Study Report 1997-98, LWA, 1998

- Study Design: A Fossil Filter was installed in a storm drain inlet draining approximately 1 acre of a parking lot. Stormwater runoff and outlet samples were collected onsite.
- Sediment: The Fossil Filter consistently reduced sediment load for the three events sampled. TSS concentrations decreased by 40% on average for concentrations between 25 mg/L and 47 mg/L.
- Petroleum Hydrocarbons: TPH-diesel concentrations decreased by 50% on average (n=2) for concentrations less than 1 mg/L. The small number of samples makes it difficult to generalize from this observed reduction.
- Metals: Total copper and total lead concentrations were reduced by 28% and 33% on average (n=3). Inlet copper concentrations ranged from 5.2 µg/L to 15 µg/L and inlet lead concentrations ranged from 2.2 µg/L to 3.3 µg/L. Dissolved zinc concentrations were reduced 13% on average, however, reductions were not consistent among the three samples taken. Dissolved zinc concentrations fell from 50 µg/L to 16 µg/L for one storm event and rose from 35 µg/L and 59 µg/L to 46 µg/L and 63 µg/L respectively in the other two events sampled.

R0069204

- Maintenance: Flow bypassed the Fossil Filter in those storm events generating above 0.05 inches of rainfall per hour. Filter media had to be replaced before each monitoring event due to debris buildup. If grading is uneven around the inlet, bypass flows are more likely to occur as water preferentially flows to the filter from one direction.

3.3.4 Santa Monica Bay Area Municipal Storm Water/Urban Runoff Pilot Project-Evaluation of Potential Catchbasin Retrofits, WCC, UCLA, and Psomas and Associates, 1998

- Study Design: This testing program used full scale simulations, bench scale tests, and shake tests, to determine removal efficiencies of the OARS polymer (AbTech) and alumina silicate media (similar to the filter media used in the SIFT Filter and Fossil Filter). In all three laboratory tests controlled flow of water with known concentrations of used motor oil were passed through the filter media. Water with used motor oil was shaken to create emulsified oil and grease for the shake tests.
- Sediment: Not studied.
- Petroleum Hydrocarbons: The OARS polymer had oil and grease removal efficiencies of 83% and 74% in full scale simulations and up to 91% in bench scale tests. However, the OARS polymer only had a 3% removal efficiency for emulsified oil and grease (influent concentration of 20 mg/L) in the shake test. The alumina silicate media removed up to 91% of oil and grease in full scale simulations and up to 86% in bench scale tests. The alumina silicate media had a 0% removal efficiency for emulsified oil and grease (influent concentration of 20 mg/L) in the shake test.

  This study only reported the average removal efficiencies. The laboratory reports were not available for this literature review.
- Metals: Not studied.
- Maintenance: The study indicated that the sorbent breakthrough time depends on several factors, including mass of oil applied (flow and concentration), mass of sorbent, and packing density. No other information regarding maintenance was included.

These studies suggest that while some inlet insert devices may reduce petroleum hydrocarbon concentrations, they also have high maintenance requirements. If a particular installation is not properly maintained, at best the insert will fail to remove additional pollutants, and at worst it will reintroduce previously captured pollutants.

R0069205

Table 5. Summarized Results of Studies

Device	Sediment Findings	Petroleum Hydrocarbon Findings	Metals Findings	Maintenance
Evaluation of Commercially-Available Catch Basin Inserts for the Treatment of Stormwater Runoff from Developed Sites				
Enviro-Drain w/ screen & 1-2 trays of Absorbent W™ & 0-1 of GAC	TSS reductions ranging from -25% to +28%.	Some O&G removal when in new condition but unable to reduce concentrations to <10 mg/L.	No discernible removal of copper, lead, and zinc.	Maintenance cycle limited by clogging of the filter surface or screens.
Gullywasher basket w/wo Absorbent W™	TSS reductions ranging from -41% to +15%.	O&G reductions of approximately 35%.	No discernible removal of copper, lead, and zinc.	Maintenance cycle limited by clogging filter surface.
StreamGuard w/ oil-sorbing strips	TSS reductions ranging from -15% to +25%.	Reduction of O&G concs to <10 mg/L when in new condition.	No discernible removal of copper, lead, and zinc.	Maintenance cycle limited by clogging filter surface.
Parking Lot Monitoring Report				
Enviro-Drain w/ screen & 2 trays of Absorbent W™	No significant TSS reduction observed.	TPH reduction from 9.1 mg/L to 0.6 mg/L.	No discernible removal of chromium, copper, lead, nickel or zinc.	Top tray easily clogged by leaves and pine needles.
Gullywasher basket w/ Absorbent W™	No significant TSS reduction observed.	TPH reduction from 1.2 mg/L to 0.82 mg/L.	No discernible removal of chromium, copper, lead, nickel or zinc.	The outer filter caused clogging of the unit.
StreamGuard w/ oil-sorbing strips	No significant TSS reduction observed.	TPH reduction from 4.8 mg/L to 0.73 mg/L.	No discernible removal of chromium, copper, lead, nickel or zinc.	The bottom of the filter bag broke during a storm.
NDMP Inlet/In-line Control Measure Study Report 1997-98				
Fossil Filter w/ alumina silicate media	TSS reductions of 40% on average for concs between 25 mg/L and 47 mg/L (n=3).	TPH-diesel reductions of 50% on average for concs below 1 mg/L (n=2).	Ave. reductions: 28% for Cu from 5.2 µg/L to 15 µg/L; 33% for Pb from 2.2 µg/L to 3.3 µg/L; & 13% for diss Zn.	Media had to be replaced before each event due to debris buildup.
Santa Monica Bay Area Municipal Storm Water/Urban Runoff Pilot Project-Evaluation of Potential Catchbasins Retrofits				
OARS polymer	Not studied.	O&G removal efficiencies of 83% and 74% in full scale simulations.	Not studied.	No field tests were conducted.
Alumina silicate media (SIFT Filter and Fossil Filter)	Not studied.	O&G removal efficiency of 91% in full scale simulation.	Not studied.	No field tests were conducted.

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3.4 ESTIMATED COSTS

Inlet insert devices, must be periodically maintained and replaced. Some geotextile bag units (StreamGuard and Storm Watch) are single use devices while other units depend on replaceable filter media and/or hydrocarbon-sorbing material to remove pollutants. The useful life of the geotextile bag units depends on sediment and debris loads while the useful life of filter media and hydrocarbon-sorbing material depends primarily on hydrocarbon loads. In addition, these units may be bypassed if sediment and/or debris loads are sufficiently high, in other words, filter media and hydrocarbon-sorbing materials can be plugged or coated by sediment and debris which reduces their effectiveness. The replacement rates vary depending on a variety of site specific conditions including sediment, debris, and pollutant loads; volume of media; and stormwater flow rates. Maintenance frequencies noted in field studies ranged from once every storm event to four times a year. Therefore, capital costs of alternative units must be compared on a site specific basis. Estimated capital costs to install the devices and purchase filter media and hydrocarbon-sorbing materials are summarized in Table 6. Note: Labor costs are not included. Labor for installation and maintenance would be site dependent.

Table 6. Estimated Costs to Purchase Inlet Insert Devices and Replace Media

Device	Manufacturer	Type of Unit	Capital Costs	Media Costs
Gullywasher	Aqua Treatment Systems	Geotextile bag	$275-$360 per unit.	Maintenance costs of $150 per year.
Storm Watch	Builders Environ-mental Marketing	Geotextile bag	$63-$125 per unit.	Single use device.
StreamGuard	Foss Environmental Services	Geotextile bag	$53-$100 per unit.	Single use device.
Ultra-Urban Filter w/ OARS OnBoard	AbTech Industries	Mesh bag with filter media	$250 per unit.	Media replacement about $99 per unit.
Fossil Filter	KriStar Enterprises	Basket with filter media	About $450 per unit.	Media replacement $180 per year.
Gullywasher	Aqua Treatment Systems	Basket with filter media	$450-$700.	Media replacement $150 per year.
SIFT Filter	Revel Environ-mental Marketing	Basket with filter media	$350 -$700 per unit.	Media replacement $60-$150 per unit.
Enviro-Drain	Enviro-Drain	Multi-tray with filter media	$4,500 for set of three trays.	Media replacement $20-$50 per unit.
BMT Storm Clenz Filter	Best Management Technologies	Plastic cartridge with filter media	$350-$800 per unit.	Media replacement $20-$55 per unit.
Hydro-Cartridge	EP International	Bi-directional unit w/ sorbent	$680-$1160 per unit.	$25 to replace oil absorbing pads.

R0069207

The inlet inserts reviewed vary greatly in construction and target pollutant(s). The units reviewed included geotextile bags, baskets filled with filter media, fabric mesh bags containing oil sorbing material, multi-tray inlet inserts filled with various filter media, and a bi-directional plastic cartridge. Filter media included oil-absorbent pillows constructed of an oil-selective polymer or a cellulose filter, alumina silicate beads, and activated carbon. Target pollutants were mainly sediment and debris and petroleum hydrocarbons. Other pollutants that may be captured are heavy metals and fertilizers and pesticides.

Some manufacturers make specific claims for their products in marketing literature that, for the most part, are not substantiated by readily available material. In no case, were specific manufacturer claims substantiated by adequate available supporting documentation. In addition, what little information was available about how manufacturer tests were carried out, did not indicate that likely field conditions were replicated. Therefore, manufacturer claims were not used to evaluate removal efficiencies for any inlet insert device.

The four completed scientific studies available suggest that while some inlet insert devices may reduce petroleum hydrocarbon concentrations, they also have high maintenance requirements. If a particular installation is not properly maintained, at best the insert will fail to remove additional pollutants, and at worst will reintroduce previously captured pollutants.

Inlet insert devices, in the case of geotextile bag units, and filter media and hydrocarbon-sorbing material must be periodically replaced. The useful life of a particular insert or filter media batch varies depending on several site specific conditions including sediment, debris, and pollutant loads; volume of media; and stormwater flow rates. Therefore, capital costs of alternative units must be compared on a site specific basis and could easily range from as little as $50 to as much as $5,000.

More scientifically defensible information is needed to make meaningful recommendations about which particular unit, if any, is most appropriate for a specific field situation. But perhaps more importantly, a commitment to adequately maintain any device installed is required to achieve the best pollutant removal possible from any given inlet insert device.

Brown, Whitney and Thomas R. Schueler. 1998. BMP pollutant removal database. Developed by the Center for Watershed Protection. Silver Spring, Maryland.

EOA. 1997. Catalog of structural stormwater quality control measures. Oakland, California.

Interagency Catch Basin Insert Committee. 1995. Evaluation of commercially-available catch basin inserts for the treatment of stormwater runoff from developed sites. October.

Lau, S. and M.K. Stenstrom. 1995. Application of oil sorbents in oil and grease removal from stormwater runoff. Water Environment Federation 68th Annual Conference and Exposition.

Larry Walker Associates. 1998. NDMP inlet/in-line control measure study report 1997-98. Prepared for County of Sacramento, City of Sacramento, City of Folsom, and City of Galt. June.

1997. Technical notes: new stormwater retrofit technologies may extend life of urban developments. Nonpoint Source News. January/February 1997, Issue #47.

Woodward-Clyde. 1994. Storm inlet pilot study. Oakland, California.

Woodward-Clyde. 1996. Parking lot monitoring report. Prepared for Santa Clara Valley Nonpoint Source Pollution Control Program. June 11.

Woodward-Clyde. 1996. Parking lot BMP manual. Prepared for Santa Clara Valley Nonpoint Source Pollution Control Program. June 11.

Woodward-Clyde. 1997. Catch basin assessment: phase II -- literature review and maximum extent practicable evaluation. Oakland, California.

Woodward-Clyde, UCLA, and Psomas and Associates. 1998. Santa Monica Bay area municipal storm water/urban runoff pilot project-evaluation of potential catch basin retrofits. September 24.

Companies that provided literature for inlet insert devices:

- Aqua Treatment Systems on the Gullywashers
- Revel Environmental Marketing on the SIFT filter
- Builders Environmental Marketing on the Storm Watch catch basin insert
- Best Management Technologies on the Storm Clenz filter
- KriStar on the Fossil Filter
- Foss on the StreamGuard
- Enviro-Drain on the Enviro-Drain insert
- AbTech Industries on OARS
- EP International on the Hydro-Cartridge

STATE OF CALIFORNIA—THE RESOURCES AGENCY GRAY DAVIS, GOVERNOR

CALIFORNIA COASTAL COMMISSION
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January 20, 2000

California Regional Water Quality Control Board
Los Angeles Region
Mr. Dennis Dickerson, Executive Officer
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: Proposed Standard Urban Stormwater Mitigation Plan

Dear Mr. Dickerson:

In light of your consideration of the proposed Standard Urban Stormwater Mitigation Plan for Los Angeles County and Cities in Los Angeles County, dated December 7, 1999, I wanted you to know that the California Coastal Commission has adopted, as guidance in carrying out its Coastal Act responsibilities, a *Plan for Controlling Polluted Runoff* (Coastal CPR Plan). The Coastal CPR Plan outlines the Commission's authorities to address polluted runoff and identifies actions, with timelines and milestones, to achieve the Commission's objective to reduce polluted runoff.

The Coastal CPR Plan addresses, among other issues, one raised in the proposed Standard Urban Stormwater Mitigation Plan. As adopted by the Commission on January 11, 1999, the Coastal CPR Plan includes language on capturing, infiltrating or treating urban runoff up to and including the 85th percentile storm, or 10% of the fifty-year storm. This language serves as guidance for the case-by-case review of projects pursuant to the Commission's regulatory and planning responsibilities under the Coastal Act.

Accordingly, we want to express support for the language in Section 9 (Design Standards for Treatment Control BMPs (page 8 of 17, Final Tentative, December 7, 1999)) of the Standard Urban Stormwater Mitigation Plan that states:

Post-construction Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. each runoff event up to and including the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87* (1998) or
2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook-Industrial/Commercial* (1993), or ....

Thank you for your consideration of our comments. Please feel free to call me (415/904-5265) if you have any questions.

Sincerely,

Jaime C. Kooser, Ph.D.
Deputy Director,
Energy, Ocean Resources, and Water Quality

R0069210

11-153-A-11

STATE OF CALIFORNIA— THE RESOURCES AGENCY GRAY DAVIS, GOVERNOR

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January 10, 2000

California Regional Water Quality Control Board
Los Angeles Region
Mr. Dennis Dickerson, Executive Officer
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: Proposed Standard Urban Stormwater Mitigation Plan

Dear Mr. Dickerson: Dennis

The California Coastal Commission staff has reviewed the proposed Standard Urban Stormwater Mitigation Plan (the Plan) for Los Angeles County and Cities in Los Angeles County, dated December 7, 1999. The Standard Urban Stormwater Plan includes many detailed, innovative policies that will, if the Plan is approved, improve the quality of California's coastal waters. Thus, we urge the Regional Board's adoption of the Plan.

We recognize that polluted runoff is the number one cause of pollution in coastal waters. We believe the implementation of the proposed Plan will improve water quality. The Plan will be effective because it defines stormwater requirements for nine project categories, specifies numerical design standards for post-construction treatment control best management practices (BMPs), and provides developers and land use professionals with specific information regarding feasible on-the-ground improvements. The approach that your staff recommends requires incorporation of BMPs into the design phase of development and redevelopment. This approach will improve the quality of runoff from each project. In time, this may lessen the need for after-the-fact treatment measures. We believe that this program can serve as a model statewide.

Therefore we urge the Regional Board to approve the proposed Plan, and adopt the accompanying numerical mitigation standards, as the minimum design criteria for review of post-construction BMPs in the Los Angeles Region for construction projects subject to coverage under the state stormwater general permit for construction activity.

Thank you for the opportunity to express our support.

Sincerely,

Jaime C. Kooser

Jaime C. Kooser, Ph.D.
Deputy Director,
Energy, Ocean Resources, and Water Quality

R0069211

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, CA 90013
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Gray Davis
Governor

DAD

TO: **Los Angeles County Municipal Storm Water and Urban Runoff NPDES Permittees**
Long Beach Municipal Storm Water and Urban Runoff NPDES Permittee
Interested Parties

FROM: **Xavier Swamikannu**
Storm Water Program

DATE: **December 17, 1999**

SUBJECT: **Proposed Standard Urban Storm Water Mitigation Plan and Supporting Regional Board Resolution**

On December 7, the Regional Board Executive Officer transmitted a memorandum with the proposed Standard Urban Storm Water Mitigation Plan package (the Plan). The memorandum stated that the Regional Board would conduct a special meeting on January 6, 2000, to consider the proposed Plan and a tentative resolution to approve it. The Board Meeting has now been rescheduled to January 26, 2000, and a Public Notice has been sent out notifying the time and location.

Persons wishing to comment on the proposed Plan are invited to submit them in writing to the attention of Dr. Xavier Swamikannu. To be evaluated by Board staff and included in the Board's agenda folder, written comments or testimony on the proposed Plan must be received at the Regional Board's office by January 14, 2000. Comments received after that date will be provided, ex agenda, to the Board for their consideration.

It is expected that many interested parties will wish to speak before the Regional Board on January 26, 2000. In an effort to ensure that the Regional Board is provided with a comprehensive understanding of the concerns associated with this proposal, special arrangements for the presentation of comments are being considered. Specific details on the presentation arrangements for the January 26th Board meeting will be provided in the regular agenda notice. Interested parties are encouraged to contact the Regional Board Executive Officer to suggest consolidation of comments from many parties into a more comprehensive presentation with an extended time limit.

If you represent a Permittee or other interested party, it would be helpful if you would coordinate with other co-interested individuals and notify this office by January 14, 2000, of (1) lead designated speaker; (2) amount of time needed by the lead speaker; and (3) your request for time for additional speakers and the identity of such additional speakers. The Board will announce the amount of time available for the submission of oral comments in this matter and for discussion among the Board members in the formal notice of the Board's agenda. Upon receipt of the above information, the staff will recommend an allotment of time for all interested parties, based upon the information received. Parties who have not submitted the requested information will be provided any remaining time following allotment.

R0069212

California Regional Water Quality Control Board

Los Angeles Region

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Secretary for Environmental Protection

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Gray Davis
Governor

TO: **Los Angeles County Municipal Storm Water and Urban Runoff NPDES Permittees**
Long Beach Municipal Storm Water and Urban Runoff NPDES Permittees
Interested Parties

FROM: **Dennis A. Dickerson**
Executive Officer

DATE: **December 7, 1999**

SUBJECT: **Proposed Standard Urban Storm Water Mitigation Plan and Supporting Regional Board Resolution**

On September 16th, at the Regional Board meeting, I advised the Regional Board that additional time to develop a revised Standard Urban Storm Water Mitigation Plan proposal would be in the best interest to ensure that the proposal were more fully documented and supported by the record. At that time, I indicated that Regional Board staff would develop a revised proposal at the earliest opportunity but probably not less than 90 days later. This proposal has been developed and is being noticed through this memorandum to Permittees and Interested Parties. The proposal is also being mailed and placed on the Regional Board's Internet website.

The proposed Standard Urban Storm Water Mitigation Plan is designed to ensure that storm water pollution is addressed in one of the most effective ways possible, i.e., by incorporating Best Management Practices (BMPs) in the design phase of new development and redevelopment. The proposal also provides for numerical design standards to ensure that storm water runoff is managed for water quality concerns in addition to flood protection and that pollutants carried by storm water are retained and not delivered to waterways.

The proposed Standard Urban Storm Water Mitigation Plan adds two additional categories for controls, parking lots and environmentally sensitive areas. The proposal also attempts to respond to various concerns by incorporating provisions that allow for flexibility thereby recognizing that a single numerical standard may not be appropriate in every case. Also, the proposed Standard Urban Storm Water Mitigation Plan has taken the original language offered by the Principal Permittee and eliminates much of the duplication allowing for a more concise and understandable document.

A Tentative Resolution is also being offered to the Regional Board for their consideration at the January 6, 2000 Board Meeting. This Tentative resolution acknowledges the structure of both the Los Angeles and Long Beach Municipal Storm Water Permits by allowing the Standard Urban Storm Water Mitigation Plan approval to be accomplished by the Executive Officer for the Los Angeles permit while the Regional Board itself would approve the Standard Urban Storm Water Mitigation Plan pursuant to the City of Long Beach permit. If adopted by the Regional Board, the Tentative resolution would approve the Long Beach Standard Urban Storm Water Mitigation Plan while encouraging the Executive Officer to approve the Los Angeles Standard Urban Storm Water Mitigation Plan. In addition, the Regional Board is being asked to adopt the numerical design standards as the minimum standards for

post-construction BMPs required by the statewide general permit for construction activity for construction projects in the Los Angeles Region.

The September 16, 1999 public hearing was lengthy with many commentors. It is understood that many interested parties will again wish to speak before the Regional Board. In an effort to ensure that the Regional Board is provided with a comprehensive understanding of the concerns associated with this proposal, special arrangements for the presentation of comments are being considered. Specific details on the presentation arrangements for the January 6th Board meeting will be provided in the regular agenda notice. Interested parties are encouraged to contact the Executive Officer to suggest consolidation of comments from many parties into a more comprehensive presentation with an extended time limit.

If you represent a Permittee or other interested party, it would be helpful that by December 20, 1999 you would coordinate with other co-interested individuals and notify this office of (1) lead designated speaker; (2) amount of time needed by the lead speaker; and (3) your request for time for additional speakers and the identity of such additional speakers. The Board will announce the amount of time available for the submission of oral comments in this matter and for discussion among the Board members in the formal notice of the Board's agenda. Upon receipt of the above information, the staff will recommend an allotment of time for all interested parties, based upon the information received. Parties who have not submitted the requested information will be provided any remaining time following allotment.

CC: Regional Board Members

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

Final Tentative
December 7, 1999.

R0069215

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit, which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

Discretionary projects, that fall into one of seven categories are identified in the NPDES Permit

as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units*

* (Note: this category is two separate categories in the NPDES Permit)

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements. These categories are:

Location adjacent to or discharging to an environmentally sensitive area, and
Parking lot 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

DEFINITIONS

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"100,000 Square Foot Commercial Development" means Developments based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

"Retail Gasoline Outlet" means a facility primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope and where grading contemplates cut or fill slopes .

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

"Restaurant" means a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

"Parking Lot" means land area or facility for the parking of commercial or business or private motor vehicles.

"Environmentally Sensitive Area" means an area designated as an Area of Special Biological Significance by the State Water Resources Control Board or an area designated as a Significant Natural Area by the California Resources Agency or an area designated as an area of Ecological Significance by the County of Los Angeles.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures,, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both treatment control BMPs and source control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Infiltration" means the downward entry of water into the surface of the soil.

"Directly Connected Impervious Area (DCIA)" means the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

Redevelopment" means, on an already developed site, the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces .

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes , (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMPs contained herein to be consistent with the code, except where those practices would defeat or circumvent the intent of the SUSMP requirements.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate may result in a foreseeable increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable , the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as

approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*: *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* . USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question..

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

If applicable, project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.

Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following *structural BMP* requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, treatment control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, this verification will include the developer's signed statement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any treatment control BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the treatment control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If treatment control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Treatment control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS

Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

Post-construction Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. each runoff event up to and including the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or

3. the volume of runoff produced from each and every storm event up to and including 0.75 inch of rainfall, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from each and every storm event up to and including a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a. the roofing materials will not be a source of pollutants of concern in storm water, and

b. storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c. roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly or indirectly discharge to a natural stream or unlined channel or channel segment scheduled for restoration.

Exclusions

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the requirements of this Section.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the

following BMPs:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that deposit on these surfaces from motor vehicle traffic. These pollutants are directly transported to surface waters.

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code inc incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. Recognized situations of impracticability include (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because an underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately approved by the Regional Board Executive Officer before it becomes recognized and effective. A waiver granted to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPS

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

A Permittee may elect to accept a signed certification that the plan meets the criteria established herein and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria, in lieu of conducting detailed BMP review to verify treatment control BMP adequacy. The training must have been conducted by an organization with storm

water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, or the California Water Environment Association) with the training and curriculum accepted by the Regional Board Executive Officer. For the certification to be valid, training must have been received not more than two years prior to the signature date on the plan.

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988 Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs.	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA-840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil Water separators
- Catch basin inserts
- Continuous flow deflection/ separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

STANDARD URBAN STORM WATER MITIGATION PLANS

SUMMARY OF COMMENTS RECEIVED AND RESPONSE

The comments received on the Standard Urban Storm Water Mitigation Plans (SUSMPs) and Regional Board staff response is divided into two sections. The first sections, lists main issues and staff response in detail. The second section summarizes all significant comments received by the Board on SUSMP before December 6, 1999, and the staff response including any actions taken to address the comment.

A. MAIN ISSUES AND RESPONSE

1. **Comment**:The Regional Board lacks regulatory discretion to establish a numerical mitigation measure for storm water treatment.

Response: The municipal storm water permit for Los Angeles County and Cities requires that SUSMPs achieve specific objectives which include to (i) minimize adverse impacts to natural communities; (ii) maximize infiltration to the extent practicable; (iii) minimize parking lot pollution; (iv) provide for appropriate controls to reduce storm water pollutant loads.[1] Staff interprets this provision of the permit, underlying federal law, and the statutory standard of Maximum Extent Practicable (MEP) as requiring SUSMPs to incorporate numerical mitigation measures for development planning projects in order to achieve compliance with water quality standards. Without a numerical mitigation measure, developers will select no treatment BMPs because there will be no BMP sizing guideline. Board Resolution No. 99-03 which states that "The Permittees shall select and require implementation of the most effective BMPs,...." will then be without effect.[2]

The 1987 Clean Water Act amendments give USEPA and States considerable discretion on establishing provisions for implementation in storm water programs.[3] Further, interim USEPA policy guidelines on BMPs for storm water programs explains that the permitting authority can require more specific conditions or limitations to meet water quality

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[1] Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles (Board Order No. 96-054; NPDES No. CAS614001). Part 2. III.A.2)

[2] The Regional Board adopted Resolution No. 99-03 approving BMPs for Development Planning and Development Construction on April 22, 1999.

[3] 33 U.S.C. Section 1342(p)(B)(iii). "require controls to reduce the discharge of pollutants to the maximim extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of pollutants."

standards where adequate information exists.[4] In addition, courts accord administrative agencies a high degree of deference in the areas of law they regulate.[5]

2. **Comment:** Anti-degradation policy prohibits new construction when water quality is already impaired.

Response: The municipal storm water permit in agreement with federal storm water regulations requires controls on new development to reduce storm water pollution. There is no prohibition on new construction.

3. **Comment**: The numerical mitigation criteria mandates the capture of storm water which will require expensive land acquisition cost.

Response: The numerical mitigation measure defines the definite volume of storm water that must be treated for water quality benefits. Treatment is the application of any physical, biological, or chemical method that can be used to remove pollutants in storm water. Providing storage volume for the runoff or capture is one form of treatment. It is not mandatory and other options may be considered such as reducing impervious cover and promoting infiltration.

4. **Comment**: The proposed numerical mitigation measure is not based on science and is an arbitrarily agreed to number in settlement of a lawsuit.

Response: The proposed numerical measures are technically defensible. The measures are based on the principle that most rainfall events are in the smaller range and higher rainfall runoff producing events are less frequent. Designing storm water treatment controls for the smaller events will reduce storm water pollutant loads significantly while optimizing BMP costs. The primary numerical method to determine BMP design criteria is the maximized water quality treatment volume method recommended by the American Society of Civil Engineers (ASCE). The 0.75-inch rainfall event method happens to be also the one that was agreed to in a lawsuit settlement agreement between the NRDC and the County of Los Angeles. The four methods proposed as choices are equivalent variants and in a technical comparison were in agreement to within 10% of one another. It is highly probable that parties that settle a litigation select a numerical criterion that is reasonable and factual.

5. **Comment**: The numerical mitigation measure will require implementation of BMPs that have not been proven to be effective in the region.

Response: The proposed numerical mitigation measure defines the quantity of storm water (volume) that has to be treated to remove pollutants. This criterion does not in anyway describe the effectiveness of BMPs to be used. The effectiveness of any particular BMP is dependent on design parameters and the range for its applications. Physical geography has little influence on the effectiveness of BMPs while proper

[4] 61 Fed. Register 43761. "The interim permitting approach uses best management practices in first-round strom water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate."

[5] See, e.g., Chevron U.S.A. v. Natural Res. Def. Council, (1984) 467 U.S. 837

maintenance is a big factor. Information on BMP effectiveness can be found in research reports and national BMP databases. The numerical mitigation measure in combination with the effectiveness of a BMP determines the overall annual load of pollutant that can be removed.

6. **Comment**: The post-construction treatment BMPs will require costly maintenance

Response: Treatment BMPs do require proper maintenance and maintenance costs are BMP specific. Poor or non-existent maintenance will result in an ineffective BMP. Information on BMP maintenance costs can be obtained from national databases and reports. See references in the Record of Decision. A cursory review indicates that maintenance costs are reasonable.

7. **Comment**: The Regional Board did not perform an economic analysis required by State and Federal law.

Response: The implementation of a federal regulation does not require separate economic analysis. A relative quantitative comparison performed with similar criteria for storm water management or flood control, sediment removal from construction, combined animal feedlot operations, and State of Washington water quality criteria indicated that the numerical mitigation criteria would cost about three to ten times less. In addition, staff performed BMP cost calculations for an actual site in Los Angeles in the process of development and determined that the mitigation criteria cost is less than 0.5 percent of the project cost.

8. **Comment**: The Regional Board did not provide adequate public notices to interested parties.

Response: Regional Board action was not contemplated at the September Regional Board meeting and thus no public notice was necessary. Nevertheless, Board staff provided a 30-day public notice and mailed a copy to all parties on file. Staff was unable to verify the claim by some that they did not receive copies of the public notice or provide an explanation. Staff will again provide 30 day-notice of the proposed action on the SUSMPs scheduled by the Regional Board for January 6, 2000.

B. SUMMARY OF ALL SIGNIFICANT COMMENTS AND RESPONSE

COMMENTER	COMMENT	RESPONSE	ACTION
General City of Los Angeles, Western States Petroleum Association	1. Conduct first a quantitative review of the basis of designation of selected categories as priority-planning projects.	The categories are designated in the permit and were selected based on risk sources data compiled in the first term of permit implementation.	No action necessary
Los Cerritos Channel Task Force	2. Provide level playing field for unincorporated and incorporated cities within LA County	Four methods of determining the mitigation measure are provided to ensure some flexibility. The methods are equivalent. See ROD	Four equivalent methods included as mitigation criteria in SUSMP

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	3. No other MS 4 permits in California require numerical criteria for runoff mitigation	All MS4 permits are required to have controls on new development and redevelopment that will reduce pollutants to the MEP. The USEPA has identified the lack of specific criteria as a deficiency in its Report to Congress ON Phase II (1999)	No action necessary
SCAG	4. Provide the opportunity for the development of regional BMPs instead of site by site requirements	May be considered by Board in a Resolution	Will suggest interest to Regional Board
SCAG	5. Make the numerical mitigation measure voluntary pilot program for the first two years.	Federal laws and regulations require that controls on new development and redevelopment be enforceable	No action necessary
Santa Monica	6. More studies not necessary to establish mitigation criteria and evaluate BMPs	We agree that there exists sufficient information to establish numerical mitigation criteria and to design BMP for optimum performance and effectiveness.	No action necessary
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	7. Numerical mitigation measure is an unfunded mandate	Implementation of a federal permit program is not an unfunded mandate as described in the State constitution. See memo from legal counsel.	No action necessary
Bellflower, Claremeont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Long Beach, Los Angeles, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Clarita, Santa Fe Springs, Vernon, Whittier, BIA, EAC, New Hall Land and Farming, Long Beach Chamber of Commerce	8. Numerical mitigation measure is not based on sound science	Disagree. Our review of local data and implementation programs in states such as WA, FL, and MD indicates that the approach to establishing numerical mitigation measure is scientific and reasonable. The methods have also been endorsed by national science and engineering associations.	References to important documents provided in the SUSMP. A bibliography of references reviewed for the action is included in the ROD
Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, , Long Beach, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	9. Treatment controls will be required irrespective of siting factors limiting application.	Site conditions will determine what BMPs are appropriate. A provision for waiver is provided where mitigation may be infeasible. Mitigation banking may be an alternative.	Waiver provision has been included in the SUSMP where impracticability is established.
Covina, Irwindale, La Mirada, Lomita, Norwalk, Whittier	10. Provide sufficient time for Council of Governments to review and comment	Staff will mail and e-mail copies to SCAG for distribution to COGs.	Staff will mail public notice of proposed action to SCAG and COGs
Cerritos, Diamond Bar	11. Developers will move to build in counties without numerical mitigation measures.	The mitigation measure requirement for new development is based on federal law. Other Regional Boards are likely to develop and evaluate compliance using similar criteria. The USEPA considers the absence of numerical storm water BMP design criteria for new development a deficiency. See USEPA Phase II Final Rule	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, , Long Beach, Lynwood, Maywood, Montebello, Paramount Glendora, , Norwalk Rancho Palos Verdes, Santa Fe Springs, Whittier, Truxaw and Associates, Long Beach Chamber of Commerce	12. BMPs will require costly maintenance	Maintenance of BMPs is essential and strategies to support maintenance activities are discussed in USEPA's Phase II Final Rule.	No action necessary
Azusa, Claremont, EAC	13. Perform cost benefit analysis	The implementation of federal law does not require a separate cost benefit analysis. Relative cost comparisons and BMP cost calculations performed indicate that the cost of the mitigation measure is reasonable for the water quality benefits it will bring.	No action necessary
Centex Homes, Desert Partners, Bill Ehrlich, FORMA, Engineering Contractors Association, Greystone Homes, John Laing Homes, Mid-cities Escrow, JTL, New Hall Land and Farming, New Urban West, Pace Engineering, Pacific bay Homes, Pacific Soils Engineering, David Placek, Psomas, Ramseyer, Rasmussen, Shea Homes, Sikand, Southern California Contractors, Southern California Ready Mix Concrete Assoc., South Place Corp., SunCal Co., Taylsor Woodrow., Tetra Tech, Van Tilburg and Associates, Warmington Homes, Western Pacific Housing, LA County Supervisor Knabe.	14. SUSMP is stringent enough without the numerical mitigation measure	Without the numerical mitigation measure the SUSMP does not provide adequate guidance on design criteria for BMPs. Thus no treatment BMPs or BMPs inadequately sized may be selected with no benefit to water quality. The USEPA in the preamble to Phase II Final Rule makes the same observation.	No action necessary.
Technical Heal the Bay, American Oceans Campaign, Friends of the LA River, NRDC, Kudo and Daniels, Fusion Films, Santa Monica BayKeeper, Ballona Wetlands Foundation, AHHA, H & K Interiors, Kinsella & Associates, AKERS Entertainment, Ballesteros, Stenstrom-UCLA, Chatten Broan & Assoc., South Bay SurfRider (13 members), Shatz	15. Establish for all municipalities in LA County the 0.75-inch mitigation measure or similar criteria for development planning currently in effect for the unincorporated areas.	The proposed criteria provide for the treatment of 0.75 inch or equivalent volume of runoff from new development for all areas of LA County within the jurisdiction of the Regional Board.	Criteria is made applicable to all MS4 permittees in LA county
Heal the Bay, American Oceans Campaign, Friends of the LA River,	16. Require SUSMPs for development in environmentally sensitive areas	The requirement is included for the City of Long Beach but was not one of the priority categories specifically identified in the LA County MS4 permit.	This category has been added to the SUSMP.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	17. Require mitigation of runoff from parking lots separately in each SUSMP	This is not one of the priority categories specifically identified in the LA County MS4 permit. Commercial categories specifically included have indicated that they are no different than parking lots. In addition, the Coastal Commission has often consulted the Board for appropriate BMPs and criteria.	This category has been added to the SUSMP.

COMMENTER	COMMENT	RESPONSE	ACTION
NRDC	18. Apply SUSMP requirement broadly rather than limit it to seven categories	A BMP checklist is already required for other priority projects. Expanding the SUSMP requirement may be appropriate once TMDLs have been allocated and other significant sources need to be controlled.	Two categories have been added: locations in environmentally sensitive areas, and parking lots
County of Ventura and cities	19. Include an alternative method based on volumetric and flow which uses capture of annual runoff and peak flow rate control	An equivalent volumetric method is provided based on annual volume capture. Flow rate controls are left to the judgement of the local agency.	Eight five percent treatment of annual runoff volume is provided as an equivalent mitigation criteria.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	20. Define hillside development and not defer definition to the local municipality	Will provide a general definition.	Defined in SUSMP.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	21. Apply requirements for retail gasoline outlets to any facility with a fuelling dispenser.	This is not one of the priority categories specifically identified in the LA County MS4 permit. Expansion of the applicability may be appropriate once TMDLs have been allocated and other significant sources need to be controlled.	No action necessary
USPA, San Gabriel Basin Water Quality Authority	22. Requirement for infiltration will promote pathways for groundwater and soil contamination	Risks for ground water contamination exist under certain situations. These are identified in a report by the USEPA (1993). Pre-treatment of storm water will reduce such risks. The soil acts as a natural filter and self regenerates.	A section is included in the SUSMP describing the limitations of infiltration BMPs.
Truxaw and Associates	23. Promote non structural BMPs	SUSMPs already require source control BMPs in addition to structural BMPs and treatment control BMPs	No action necessary.
Land Tech Engineering	24. Provide design specifications for BMPs based on criteria	Expect that BMP design specification will be developed by the municipalities based on the numerical mitigation measure. Interim BMP design information may be obtained from manuals developed by other states.	No action necessary
Centex Homes, Engineering Contractors Assoc., John Laing Homes, Land Tech Engineering, Pace Engineering, Pacific Soils Engineering, David Placek, Ramseyer, Rasmusen, Sikand, Southern California Contractors, Southern California Ready Mix Concrete Assoc., Tetra Tech, South Place Corp., Taylor Woodrow, Western Pacific Housing, LA New Car Dealers Ass	25. Staff proposal requires capture which is not the same as infiltration or treatment	Storm water capture is not mandatory. The proposal only requires that a certain quantity of storm water be treated with BMPs to remove pollutants in one of several ways.	No action necessary.
Vernon, Los Angeles	26. Require similar criteria for USEPA Phase I industrial facilities	The requirements are for new development in selected categories. Expansion to other categories may be considered for the next permit term. Will recommend application to construction permits in the LA Region covered by the State General Storm Water permit for construction activity.	Will propose to the Board to consider in its Resolution that the same
Brash,	27. Filter media is not an effective BMP	Disagree. Filter media are effective BMPs if properly configured. See letter to Brash from RB Executive Officer date Oct. 19, 1999.	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Clarita	28. Provide criteria for flow based controls in addition to volumetric based controls	Flow based controls which are essential to maintain BMP effectiveness, reduce flow velocities, minimize downstream erosion potential, and prevent over bank flooding are left to the judgement of the local agency.	A statement has been included in the SUSMP that flow design criteria be determined by the local agency.
Santa Clarita	29. Limit application of criteria to impervious surfaces	The criterion is applied to the whole area. Credit for the pervious areas is automatically considered through the runoff coefficient. Roofing areas have been excluded for commercial facilities.	No action necessary
Santa Clarita, EAC	30. Provide greater flexibility in application of the mitigation criteria	The four methods of selecting the numerical mitigatio through criteria and waiver procedures offer sufficient flexibility in application	Provide in the SUSMP four equivalent methods of determining the numerical mitigation measure.
Los Angeles	31. The numerical mitigation measure should be a guidelines and not a requirement for land development	Federal laws and regulations require that controls on new development and redevelopment be enforceable.	No action necessary.
Legal Los Angeles	32. Setting a numerical mitigation measure is a discretionary action. Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA.	The requirements under an NPDES permit are exempt from review under CEQA. Preliminary costing estimates indicate that they are reasonable.	No action necessary.
Los Angeles	33. Identify the regulatory authority, which authorizes the Regional Board to establish the numerical mitigation measure.	Regulatory requirement is found at 40 CFR 122.26 (d)(2)(iv)(A) (2). Statutory authority is at 33 USC 342(p)(B)(iii). See also court's opinion in Defenders of Wildlife v. Browner (No. 98-71080) (9th Cir. 1999) and in NRDC v. USEPA 966 F2d. 1292 (9th Cir. 1992)	No action necessary
Los Angeles	34. Setting a numerical mitigation measure is a discretionary action. Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA.	The requirements under an NPDES permit are exempt from review under CEQA. Preliminary costing estimates indicate that they are reasonable.	No action necessary.
Western States Petroleum Association (WSPA)	35. Postpone consideration because of inadequate notice.	A thirty-day notice on this action has been provided. A thirty-day notice on the September 1999 Board meeting was provided even though it was not required for a Regional Board Information item.	No action necessary
Apartment Association, BIA	36. There is no regulatory requirement that there be a numerical measure	Disagree. See detailed explanation under main issues and response.	No action necessary.
NRDC	37. Receiving water limits and anti-degradation policies apply independently from mitigation criteria.	Agree that mitigation standards are separate from the numerical mitigation measure. The Office of Chief Counsel confirms that MS4 programs must meet water quality standards in a memo dated October 14, 1999	No action necessary.
Burke, Williams & Sorenson	38. Provide broad legal authority for the SUSMP requirement	We will include legal citations that are relevant to the jurisdiction of the Regional Board.	Relevant laws are cited in the SUSMP to provide legal justification.
Burke, Williams & Sorenson	39. Delay SUSMP requirements in light of PL 106-74 requiring USEPA to submit reports to Congress.	The USEPA has already submitted the reports to Congress and thus no delay is warranted.	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Monica BayKeeper	40. New development can be prohibited under the Federal Anti-degradation policy if it degrades or adds pollutants to local waters	Disagree. See detailed explanation under main issues and response.	No action necessary.
EAC. Downey, Lakewood	41. Provide authority in the Clean Water Act to regulate flow to address water quality.	The U.S. Supreme Court has held that regulation of flow to protect beneficial uses is within the authority of the Clean Water Act PUD No. 1 v. WA Dept. of Ecology. 511 U.S. 700 (1994)	No action necessary.

TENTATIVE

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION

Resolution No. xx-xx

APPROVING THE RECORD FOR
STANDARD URBAN STORM WATER MITIGATION PLAN
FOR
MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS
IN LOS ANGELES COUNTY

WHEREAS, THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FINDS:

1. On July 15, 1996, a municipal storm water permit was issued to the County of Los Angeles and 85 incorporated cities to control and minimize the discharge of pollutants associated with storm water and urban runoff. This permit became Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles.

2. On June 30, 1999, a municipal storm water permit was issued to the City of Long Beach which removed the City of Long Beach from Board Order No. 96-054, giving the City of Long Beach its own distinct Municipal Storm Water and Urban Runoff NPDES permit, Regional Board Order No. 99-060, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the City of Long Beach.

3. On August 19, 1999, a statewide general storm water permit for construction activity was adopted by the State Water Resources Control Board (State Board). This permit became State Board Order No. 99-08-DWQ, and applies to construction projects that disturbs five acres or more or is part of a larger common plan of sale in the Los Angeles region.

4. Many of the rivers and streams in Los Angeles County are formally designated as impaired, pursuant to Section 303 (d) of the federal Water Pollution Control Act, for specific pollutants that are commonly found in storm water and urban runoff.

5. Storm water runoff carries with it many pollutants in varying concentrations that are suspended in, and or dissolved, in the runoff. The sources of these pollutants include nearly all properties that have been developed since the pollutants originate through the many diverse activities of habitation and land use. Pollutants generated from individual property developments vary greatly in the concentration or loading of each pollutant. Generally, the relative contribution of the pollutant from runoff from any individual property development will represent only a small portion of the entire loading of a water body given the many square miles of land upon which storm water runoff is generated. When the individual contributions from tens of thousands of discrete property units are aggregated, the pollutant loading becomes significant. The resultant pollutant loads results in the impairment of that water body and the conveyance of pollutants, including sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides to the ocean and harbors within Los Angeles County. The loading of pollutants generated in the Los Angeles area are being measured through the monitoring program being conducted by the Los Angeles County Department of Public Works in conformance with its obligations as the Principal Permittee under the Los Angeles County Municipal Storm Water and Urban Runoff NPDES permit.

6. The nature of property use is related to the types and quantities of pollutants that are transported from that property during a rainfall event.

7. As property is developed or redeveloped, the utilization of Best Management Practices provide an opportunity to reduce the loading of pollutants to water bodies. This is accomplished by various techniques and can be passive (source reduction) or active (treatment). As property is developed from undisturbed lands, the project can be designed to incorporate structural BMPs that would normally not be available or practical to use on property that has been in urban use.

8. BMPs are effective means of reducing pollutants and treatment control BMPs can be "designed-into" a project in a cost effective way and in a manner that is either transparent to or which enhances the use to which the property has been placed. Some BMPs encourage the setting aside of areas as a greenbelt to allow storm water runoff to flow over areas which are permeable, thereby allowing all or a portion of the runoff to infiltrate. Other BMPs can be designed and built into structures such as catch basins that incorporate replaceable filters to absorb oily wastes or by installing screens to prevent litter from passing through the system and into the water body.

9. Arrays of treatment control BMPs are available to developers of both new and redevelopment properties. The use of BMPs is already required by the terms of the Los Angeles County and Long Beach Municipal Storm Water and Urban Runoff NPDES permits.

10. The ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time. A BMP that can only be effective for a small volume of storm water runoff is inherently less effective than one sized to accommodate a larger volume of water.

11. Storm water runoff will normally convey a disproportionate loading of pollutants in the initial period runoff is generated during a storm event. Storm events generating up to 0.75 inches of precipitation, measured over a 24-hour period, constitute 85 percent of the total amount of runoff that can be expected during an average wet season. Designing a BMP to be able to accommodate this amount of runoff will result in the application of a BMP intervention to all but 15% of the total runoff during a year, and usually all of the critical runoff that occurs in the early phase of the precipitation event, commonly referred to as the "first Flush."

12. Both the Los Angeles County (Part III.A.1.c) and the Long Beach Municipal Storm Water and Urban Runoff permits contain provisions related to the adoption of Standard Urban Storm Water Mitigation Plans (SUSMPs) requiring their development and implementation.

13. Standard Urban Storm Water Mitigation Plans are required for a specified set of discretionary "Priority Projects" and the permit specifically identifies seven distinct categories for which SUSMPs are required to be prepared. The permit specifically states that the seven categories of "Priority Projects" are the minimum categories requiring SUSMPs.

14. Standard Urban Storm Water Mitigation Plans are also required for development or redevelopment of Parking Lots 5,000 square feet or greater and Locations in Environmentally Sensitive Areas. These categories have been added to advance efforts to control storm water pollution beyond the minimum in Los Angeles County.

15. Standard Urban Storm Water Mitigation Plans are required to be approved by the Regional Board Executive Officer following which they are to be implemented by the Permittees and used by the Permittees as the minimum criteria for the approval of project specific Urban Storm Water Mitigation Plans and the issuance of grading or building permits to project applicants.

16. The statewide general storm water permit for construction activity requires that Storm Water Pollution Prevention Plans (State SWPPPs) contain post-construction BMPs that will be implemented after construction is complete.

17. Section 402 (p) of the Clean Water Act requires the Administrator of the United States Environmental Protection Agency or her designated agent, in this instance, the Regional Board, to require as part of the storm water program "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [USC Section 1342 (p)(3)(B)].

18. A recent decision of the United States 9th Circuit Court of Appeals, Defenders of Wildlife v. Browner (1999) Case No. 98-71080, provides additional support and clarification of the authority of the Administrator and the Regional Board to impose additional controls on storm water pollution. The Court in Defenders of Wildlife v. Browner said that the USEPA and the States have discretion under the law to determine what pollution controls are appropriate to achieve compliance.

19. Pursuant to the requirements of Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, the Regional Board Executive Officer received a proposal for Standard Urban Storm Water Mitigation Plans submitted by the Principal Permittee.

20. Upon the review of the Regional Board Executive Officer, the Standard Urban Storm Water Mitigation Plan submitted for the seven applicable categories was deemed inadequate. A revised SUSMP proposal was developed subsequent to a discussion of the proposal's conceptual foundation at a public workshop held on August 10, 1999. This workshop was well attended with over 80 municipal representatives and interested parties participating.

21. On August 16, 1999, a public notice was issued indicating that the Standard Urban Storm Water Mitigation Plans proposed by the Principal Permittee would be augmented by the addition of criteria related to specifying numerical design criteria for BMP construction. The matter was noticed for the Regional Board's September meeting to allow the issue to be discussed before the Board although no formal action of the Regional Board itself is required for SUSMP approval.

22. On September 16, 1999, the Regional Board conducted a public hearing on the Standard Urban Storm Water Mitigation Plan proposal as amended by the Executive Officer. At that hearing, the Regional Board Executive Officer suggested additional time would be necessary to develop a more comprehensive proposal incorporating the comments received at the public hearing.

23. Between September 16 and December 3, 1999, the Regional Board Executive Officer met with interested parties to discuss comments and concerns from interested parties.

24. The Southern California Council of Governments (SCAG) has indicated its interest in obtaining funding to prepare a regional plan(s) to address storm water pollution and identify regional treatment solutions for implementation.

25. On December 7, 1999, the Regional Board Executive Officer released a revised Standard Urban Storm Water Mitigation Plan document to interested parties.

THEREFORE BE IT RESOLVED THAT:

1. The Regional Board endorses the Standard Urban Storm Water Mitigation Plan prepared by the Regional Board Executive Officer and noticed to the public on December 7, 1999 and the concepts therein relating to numerical storm water mitigation standards for Best Management Practices; and

2. The Regional Board encourages the Regional Board Executive Officer to approve the Standard Urban Storm Water Mitigation Plan at the earliest opportunity incorporating any specific changes recommended and formally approved by the Regional Board at the January 6, 1999 Board Hearing;

3. The Regional Board adopts the approved requirements as provisions applicable to the SUSMP requirements for the City of Long Beach.

4. The Regional Board adopts the numerical mitigation standards for storm water, endorsed herein, as the minimum design criteria for review of post-construction BMPs in the Los Angeles Region for construction projects subject to coverage under the state storm water general permit for construction activity.

5. The Regional Board encourages the Permittees and all interested parties to work together in a spirit of cooperation to effect the implementation of the Standard Urban Storm Water Mitigation Plan at the earliest possible date, and

6. The Regional Board encourages the efforts by the Southern California Council of Governments and area Council of Governments (COGs) to develop regional plans and identify regional solutions to address storm water pollution from new development and redevelopment.

I, Dennis Dickerson, Executive officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 6, 2000.

DENNIS A. DICKERSON
Executive Officer

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BY:.....



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California Stormwater Quality Task Force
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510.1415

January 14, 2000

Mr. Dennis A. Dickerson
California Regional Water Quality Control Board,
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

Proposed Standard Urban Stormwater Mitigation Plan

The California Stormwater Quality Task Force was formed to provide guidance to the State Water Resources Control Board on the development of NPDES permit and regulatory guidelines for stormwater discharges. The Task Force is officially recognized by the state in this role through Administrative Procedures Update 90-004, which states our common goals of developing feasible control programs which provide significant environmental benefits and protect designated beneficial uses, promote the advancement of stormwater management technology, and effect compliance with state and federal law. The Task Force is composed of stormwater quality management personnel from cities, counties, and special districts, and other interested professionals.

The Task Force strongly urges the LA Regional Board to consider the comments, concerns, and recommended revisions submitted by the Task force, local agencies, and stormwater professionals concerning the proposed stormwater mitigation plan.

The Task Force's primary interest in the Regional Board's proposed requirements lies in protecting the locally-driven process of determining, adopting, and enforcing: 1) appropriate stormwater quality controls as envisioned by the federal NPDES municipal stormwater permit regulations and in compliance with Porter-Cologne, 2) land use controls and development standards, and 3) regional, cost-efficient storm drainage master plans where appropriate. The Task Force believes the Regional Board's proposed requirements create an intrusion into this area of local government responsibility and therefore have more than regional significance. The Task Force also believes the proposed standard requirements will have environmental effects (e.g., land use densities) which have not been evaluated in a public forum.

The permits subject to the proposed stormwater mitigation plan provide appropriately for local creation of development standards, and provides the Regional Board Executive Officer opportunity to review and approve or disapprove such plans. Specific requirements beyond those enumerated in adopted permits should not be added to permits without a proper reopening process.

Rather than the Regional Board dictating specific local urban design standards, the Board should provide a process through which local communities select–with public stakeholder discussion–those design strategies and standards which address the permit objectives. This assures development of workable programs which are legally defensible and publically supported. By contrast, reviews of the proposed standards by engineering and stormwater professionals conclude they are difficult to verify and ambiguously worded.

Local agency boards and councils have the legal duty and must be given the opportunity by means of Regional Board policy to exercise jurisdiction over land use and development standards. These agencies have the duty to determine, implement, and enforce local land use policies to meet permit objectives. The Board is strongly urged to ensure a process consistent with this duty of local government.

The Task Force recommends the following more appropriate approach to mitigating stormwater impacts resulting from development:

1) The Regional Board's proposed stormwater mitigation plan should be returned to the local agencies required in LA Region NPDES permits to develop such plans. The agencies should be provided the opportunity to revise the plan, target specific problems, work with local constituencies, develop site-specific and regional control strategies, and secure the direction and involvement of their decision-making bodies. This process should also ensure review pursuant to the California Environmental Quality Act.

2) The Regional Board should maintain its oversight role by establishing processes within permits for review and approval (or denial) of stormwater quality control programs submitted by local agencies. If circumstances require additional controls, the Regional Board should provide appropriate means to reopen the affected permit, ensuring due process and public and agency participation.

3) There needs to be an inclusive process, working with the Regional Boards, to develop guidelines, provide evaluations of practices found to be cost-effective, and provide for the analysis of hydrology and land use, considering site-specific and regional approaches and infrastructure resources. The Task Force will work actively and collaboratively with the boards on any advisory panels they would convene for that task.

4) The policies produced by this effort should be subject to evaluation of economic and technical feasibility in compliance with the Porter-Cologne Act and review pursuant to CEQA.

The Task Force supports the requests of affected municipal stormwater management agencies to reconsider and revise the proposed standard requirements, allowing for adaptation to and coordination with land use authorities. We further urge the LA Regional Board to work with those agencies to resolve these matters.

If you have any questions or would like to discuss this matter further, please call me at (559) 456-3292.

Respectfully,

Melinda S. Marks
Chair, Stormwater Quality Task Force

c: LA Regional Water Quality Control Board Members



CALIFORNIA COASTKEEPER

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ENVIRONMENT NOW

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any

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businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Denise Washko
Director

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CENTER FOR
WATERSHED
PROTECTION

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RICHARD A. CLAYTON, JR., P.E.
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ASSISTANT DIRECTOR

RECEIVED
2000 JAN 18 P 1:39
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

January 11, 2000

Dennis Dickerson
Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Support for the 3/4 inch standard to reduce runoff from new and redevelopment

Dear Mr. Dickerson:

I recently have had the chance to review the standard urban stormwater mitigation plan for Los Angeles County and Cities in Los Angeles County. Treatment of the stormwater quality is an essential element for protecting local watersheds, and is widely used by many municipalities around the country. I strongly support the three-quarter inch runoff treatment standard based on past scientific research on the performance of stormwater best management practices. I have also enclosed a recent article on stormwater strategies for arid and semi-arid watersheds that may be helpful in adapting effective stormwater practices for your region.

Thank you for the opportunity to comment on the proposed stormwater mitigation plan. Adoption of the three quarter inch standard will help to protect the creeks and coastlines of Los Angeles from the impacts of stormwater pollutants, and represents a fair, equitable and achievable threshold for stormwater treatment.

Sincerely,

Thomas R. Schueler

Thomas R. Schueler
Executive Director

cc Mark Gold

attachment

R0069249

III. Stormwater Strategies for Arid and Semi-Arid Watersheds

Water supply and flood control have traditionally dominated watershed planning in arid and semi-arid climates. Until recent years, stormwater quality has simply not been much of a priority for water resource managers in the west. This situation is changing rapidly, as fast growing communities are responding to both emerging water quality problems and new federal regulations. In particular, larger cities in the west have gradually been dealing with stormwater quality to meet the requirements of the first phase of EPA's municipal stormwater NPDES program. Soon, thousands more smaller communities will need to develop stormwater quality programs when the second phase of this national stormwater regulatory program is rolled out later this year.

At first glance, it seems ludicrous to consider managing the quality of stormwater in arid regions where storms are such a rare and generally welcome event—sort of like selling combs at a bald convention. The urban water resources of the southwest, however, are strongly influenced by stormwater runoff and by the watershed development that increases it. Indeed, the flow of many urban streams in the southwest is generated almost entirely by human activity: by urban storm flow, irrigation return flow and wastewater effluent. Thus, the quality of both surface water and groundwater in urbanizing areas of arid and semi-arid regions of the southwest is strongly shaped by urbanization.

For purposes of this article, arid watersheds are defined as those that receive less than 15 inches of rain each year. Semi-arid watersheds get between 15 and 35 inches of rainfall, and have a distinct dry season where evaporation greatly exceeds rainfall. In contrast, humid watersheds are defined as those that get at least 35 inches of rain each year, and often much more. There are many arid and semi-arid watersheds, most of which are located in fast growing regions of the western United States (Figure 1). Low annual rainfall, extensive droughts, high intensity storms and high evaporation rates are characteristic of these watersheds, and present many challenges to the stormwater manager. [Note: in some arid and semi-arid watersheds, most precipitation falls as snow and evaporation rates are much lower. These watersheds are found in portions of Alaska and at higher elevations of the Rocky Mountains and Sierra Nevada. Guidance on stormwater strategies for these dry but cold watersheds can be found in Caraco (1997)].

This article reviews strategies for managing stormwater in regions of scarce water based on an extensive survey of 30 stormwater managers from arid and semi-arid regions. Next, the article explores how source control, better site design and stormwater practices can be adapted to meet the demanding conditions posed by arid and semi-arid climates. It begins by examining the environmental factors that make stormwater management in arid and semi-arid watersheds so unique and challenging. As a consequence, stormwater strategies for the west are often fundamentally different from those originally developed for more humid regions. Some of the fundamental differences are outlined in Table 1 and are described in detail in the following text.

Soon, thousands more smaller communities will need to develop stormwater quality programs.

Figure 1. Regions of the Continental United States With Less Than 15" of Precipitation Annually

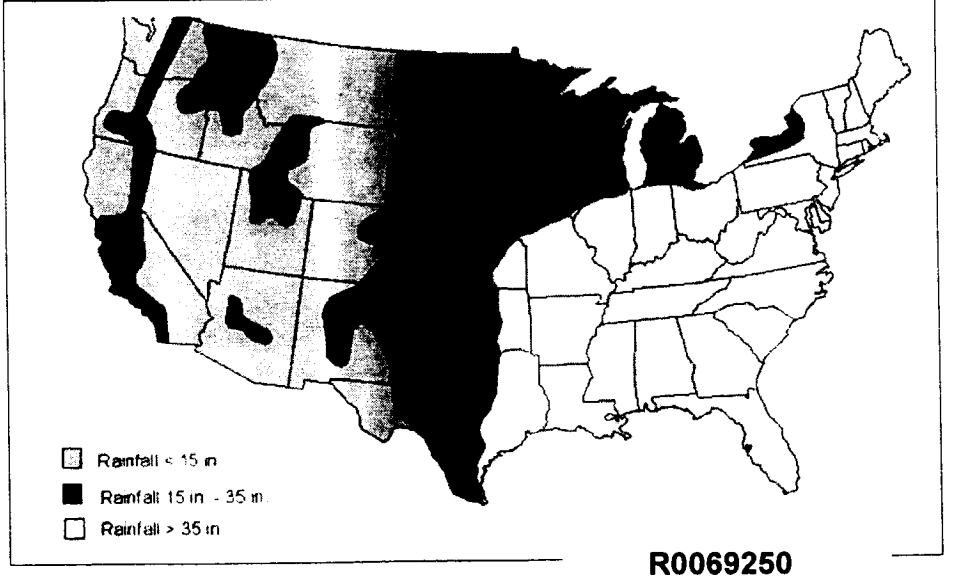

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Table 1. The West Is Different: Key Considerations in Arid and Semi-Arid Watersheds
Aquatic resources and management objectives are fundamentally different
Rainfall depths are much lower
Evaporation rates are much higher
Pollutant concentrations in stormwater are much greater
Vegetative cover is sparse in the watershed
Sediment movement is great
Dry weather flow is rare, unless return flows are present

Aquatic resources and management objectives are fundamentally different

The rivers of arid regions are dramatically different from their humid counterparts. Some idea of these differences can be seen by comparing the dynamics of an arid river to a humid one (see Box 1). The differences are even more profound for the smaller urban streams in arid watersheds. In fact, it is probably appropriate to refer to them as gullies or arroyos rather than streams, since they rarely have a perennial flow of water. Many of the physical, chemical and biological indicators used to define stream quality in humid watersheds simply do not apply to the ephemeral washes and arroyos that comprise the bulk of the drainage network of arid watersheds. Without such indicators, it is difficult to define the qualities that merit protection in ephemeral streams. Clearly, the goals and purposes of stream protection need to be reinterpreted for ephemeral stream channels, and cannot be imported from humid regions.

In humid watersheds, the first objective of stormwater management is the protection of perennial streams, with goals such as maintaining pre-development flow rates, habitat conditions, water quality and biological diversity. In contrast, the objectives for stormwater management in most arid watersheds are ultimately driven either by flood control or the quality of a distant receiving water, such as a reservoir, estuary, ocean, or an underground aquifer. Witness some of the recent water quality problems in arid and semi-arid watersheds for which stormwater is suspected to be primarily responsible: beach closures along the Southern California coast, trash and floatables washed into marinas in Santa Monica, nutrient enrichment in recreational reservoirs like Cherry Creek Reservoir in Denver and Town Lake in Austin, trace metals violations in the estuarine waters of San Francisco Bay, or concerns about the quality and quantity of groundwater recharge in aquifers of San Antonio and Austin. Usually, the only local concern is preventing the loss of capacity of irrigation channels or storage reservoirs caused by sedimentation.

Groundwater is a particularly valued water resource in arid and semi-arid watersheds. Many fast-growing western communities are highly reliant on

Box 1 **An Arid River Runs Through It**

Consider, for a moment, the characteristics of the South Platte River as it runs through Denver, Colorado, as chronicled by Harris et al (1996). Flow in the South Platte river is extremely variable with a few thunderstorms and the spring snow melt causing a half dozen dramatic peaks in discharge. Normally, however, river flows quite low, falling below the average daily flow level some 354 days a year. Much of the flow in the South Platte has been spoken for: it has been estimated that river water is used and returned back to the river from three to seven times before it leaves the state (primarily due to upstream water appropriations for irrigation). Most of the time, the river's flow is sustained by municipal wastewater effluent flows, which contribute about 90% of the river's daily flow during most of the year. Indeed, without wastewater and irrigation flows, the river would frequently run dry (as it had prior to settlement). The river continues to strongly interact with groundwater, and much of the flow moves underground. The South Platte is very warm, with summer surface water temperatures exceeding 30 degrees Celsius (and fluctuating by as much as 15 degrees each day).

From a water quality standpoint, the South Platte frequently suffers from oxygen depletion, and has high concentrations of dissolved salts and nitrogen. Prior to settlement, the South Platte River was not believed to have riparian forest corridors, but in recent years, introduced species have become well established along many parts of the river. The quality of river habitat is generally regarded as poor, due to low flows, sandy, shifting substrates, and a lack of channel structure and woody debris. The river's channel continually changes in response to extreme variations in both flow and sediment supply. These extremely variable conditions are not conducive to a diverse aquatic habitat for aquatic insects or fish. For example, fewer than a dozen fish species inhabit the South Platte River, as compared to 30 or more that might be found in a humid region.

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Table 2 Rainfall Statistics for Eight U.S. Cities (all units in inches)
Sources: NOAA, 1997; US DOC, 1975, CWP 1999

City	Rainfall Statistics					
	Annual Rainfall	Days of Rain per Year	90% Rainfall Event	Annual Evaporation Rate	Two Year, 24 Hour Storm	Ten Year, 24 Hour Storm
Washington, DC	38	67	1.2	48	3.2	5.2
Dallas, TX	35	32	1.1	66	4.0	6.5
Austin, TX	33	49	1.4	80	4.1	7.5
Denver, CO	15	37	0.7	60	1.2	2.5
Los Angeles, CA	12	22	1.3	60	2.5	4.0
Boise, ID	11	48	0.5	53	1.2	1.8
Phoenix, AZ	7.7	29	0.8	82	1.4	2.4
Las Vegas, NV	4	10	0.7	120	1.0	2.0

groundwater resources, and it is becoming a limiting factor for some. On a national basis, groundwater provides 39% of the public water supply. In the arid and semi-arid southwest, however, groundwater sources comprise 55% of the water supply (Maddock and Hines, 1995). Consequently, these communities have a strong interest in both the recharge and protection of groundwater on which they depend.

Rainfall Depths Are Much Smaller

Table 2 compares a series of rainfall statistics for eight arid, semi-arid and humid cities and documents that it rarely rains in arid watersheds. For example, in the fast growing Las Vegas, Nevada region, rainfalls greater than a tenth of an inch occur, on average, less than ten days a year. Not only does rain seldom fall, not much falls when it does. For example, 90% of all rainfall events in a given year are usually less than 0.50 to 0.80 inches in arid watersheds, compared to 1.0 to 1.5 inches in humid watersheds. If a "90% rule" was used in many arid regions, the water quality storm would be roughly half that of most semi-arid and humid watersheds, which would greatly reduce the size, land consumption and cost of structural practices that need to be built. In many cases, the entire water quality storm could be disposed of on-site through better site design, without the need for structural practices. It should be noted that there are some significant exceptions to this rule. Los Angeles, for example, experiences higher rainfall depths due to intense coastal storms in the winter, especially in el Nino years.

While intense storms cause the flash flooding that is so characteristic of the west, it is also important to keep in mind that the depth of rainfall in these storms is smaller than that of semi-arid and humid watersheds (Table 2). For example, the rainfall depth associated with the two-year 24-hour storm in most arid watersheds ranges from 1.0 to 1.4 inches, which is roughly equal to the typical water quality storm for a humid watershed. Similarly, the rainfall depth for the ten-year 24-hour storm in most arid watersheds ranges from two to three inches, which is roughly equivalent to the depth of a two-year storm in a semi-arid or humid watershed. Consequently, stormwater managers in arid regions can fully treat the quality and quantity of stormwater with about a third to a half of the storage needed in humid or semi-arid watersheds, with all other factors being equal.

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events. For example, Guay (1996) examined how development had changed the frequency of floods in arid watersheds around Riverside, California. Over two decades, impervious cover increased from 9% to 22% in these fast-growing watersheds. As a direct result, Guay determined that peak flow rate at gauged stations for the two-year storm event had climbed by more than 100%, and that the average annual stormwater runoff volume had climbed by 115% to 130% over the same time span.

Watershed development can greatly increase peak discharge rates during rare flood events.

Evaporation Rates are Greater

High evaporation rates are a great challenge in arid and semi-arid watersheds. Low rainfall combined

with high evaporation usually means that stored water will be lost water. In Las Vegas, for example, annual rainfall is a scant four inches, while pan evaporation exceeds ten feet (See Table 2). Consequently, it is virtually impossible to maintain a pond or wetland in an arid watershed without a supplemental source of water (see Saunders and Gilroy, 1997; *Technical Note* 111). Evaporation also greatly exceeds rainfall for many months of the year in semi-arid watersheds, and requires special pond design techniques.

As streams urbanize, dry weather flow can actually increase.

Pollutant Concentrations in Stormwater Are Often Higher

The pollutant concentration of stormwater runoff from arid watersheds tends to be higher than that of humid watersheds. This is evident in Table 3, which compares event mean concentrations (EMCs) from five arid or semi-arid cities to the national average for several common stormwater pollutants. As can be seen, the concentration of suspended sediment, phosphorus, nitrogen, carbon and trace metals in stormwater runoff from arid and semi-arid watersheds consistently exceeds the national average, which is heavily biased toward humid watersheds. In addition, bacteria levels are often an order of magnitude higher in arid regions (Chang, 1999).

The higher pollutant concentrations in arid watersheds can be explained by several factors. First, since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Second, pervious areas produce high sediment and organic carbon concentrations because the sparse vegetative cover does little to prevent soil erosion in uplands and along channels when it does rain. The strong effect of upland and channel erosion can be detected when stormwater samples are taken from channels, but are less pronounced in stormwater outfall pipes.

Vegetative Cover is Sparse in the Watershed

Native vegetative cover is relatively sparse in arid and semi-arid watersheds, and offers little protection against soil erosion. Irrigation is required to establish dense and vigorous cover, which may not be sensible or economical given scarce water resources. In addition, high flows released from storm drains frequently accelerate downstream erosion since channels are also sparsely vegetated. Finally, many stormwater practices require dense vegetative cover to perform properly (e.g., grass swales are often not practical in arid watersheds, given the difficulty to establish and maintain turf).

Sediment Movement Is Greater

Stream channels in arid and semi-arid watersheds move a lot of sediment when they flow. For example, Trimble (1997) found that stream channel erosion supplied more than two thirds of the annual sediment yield of an urban San Diego Creek. He concluded that the higher flows due to watershed urbanization had greatly accelerated the erosion of arroyos, over and above the increases caused by grazing, climate and riparian management. Channel erosion can be particularly severe along road ditches that experience higher stormwater flows, which not only increases sediment erosion but also creates chronic ditch maintenance problems.

Dry Weather Flows Are Rare, Unless Supplemented by Return Water

Most small streams in arid watersheds are gullies or arroyos that only flow during and shortly after infrequent storm events. As streams urbanize, however, dry weather flow can actually increase. Human sources of dry weather flow include return flows from lawn and landscape watering, car washing, and surface discharges of treated wastewater. For example,

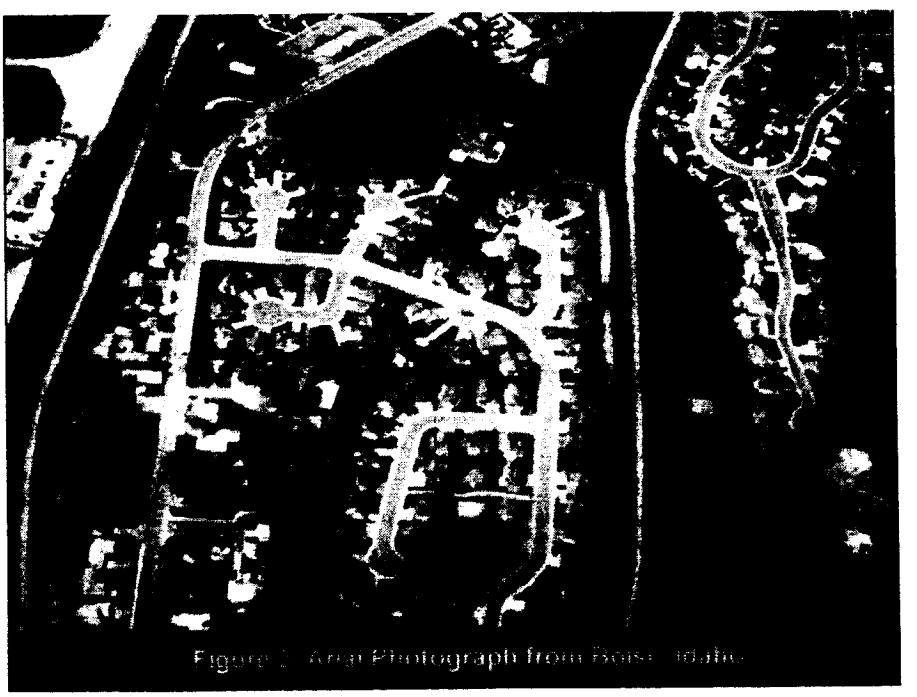

Figure 1. Aerial Photograph from Boise, Idaho.

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Mizell and French (1995) found that excess water from residential and commercial landscape irrigation and construction site dewatering greatly increased rate and duration of dry weather flow in a Las Vegas Creek, and was sufficiently reliable to be the primary irrigation source for a downstream golf course.

Stormwater Strategies for Arid and Semi-Arid Watersheds

Watershed managers need to carefully choose stormwater practices that can meet the demanding climatic conditions and water resource objectives of arid and semi-arid watersheds. Communities can employ three broad strategies: aggressive source control, better site design, and application of "western" stormwater practices. Some of the key trends in each of these areas are described below.

Aggressive Source Control

The term "source control" encompasses a series of practices to prevent pollutants from getting into the storm drain system in the first place. The practices include pollution prevention, street sweeping, and more frequent clean outs of storm drain inlets. Each practice acts to reduce the accumulation of pollutants on impervious surfaces or within the storm drain system during dry weather, thereby reducing the supply of pollutants available for wash off when it rains.

Pollution prevention. Pollution prevention seeks to change behaviors at residential, commercial and industrial sites to reduce exposure of pollutants to rainfall. Almost all arid stormwater managers considered pollution prevention measures to be an integral element of their stormwater management program, on par with the use of structural stormwater practices (Caraco, 1997). Indeed, many western communities have pioneered innovative pollution prevention programs (see *On Watershed Education*, this issue). These programs focus on educating homeowners and businesses on how they can reduce or prevent pollutants from entering the storm drain system when it's not raining.

In recent years, western communities have been targeting their educational message to more specific groups and populations (see *On Watershed Education*, this issue). For example, Los Angeles County has identified seven priority categories for intensive employee training in industrial pollution prevention — auto scrap yards, auto repair, metal fabrication, motor freight, chemical manufacturing, car dealers, and gas stations— on the basis of their hotspot potential and their numerical dominance (Swammikannu, 1998). In the Santa Clara Valley of California, the three key priorities for intensive commercial pollution prevention training are car repair, construction, and landscaping services. Targeting is also used to reach homeowners with specific water conservation, car washing, fertilization and pesticide messages (see *On Watershed Education*).

Street sweeping. Street sweeping seeks to remove the buildup of pollutants that have been deposited along the street or curb, using vacuum assisted sweeper trucks. The pollutant removal performance of a new generation of street sweeper was recently reviewed in *Technical Note* 103. While researchers continue to debate whether street sweepers can achieve optimal performance under real-world street conditions, most concede that street sweeping should be more effective in areas that have distinct wet and dry seasons (CDM, 1993), which is a defining characteristic of arid and semi-arid watersheds.

Better site design presents a great opportunity to minimize impervious cover and stormwater impacts in the west.

Storm drain inlet clean outs. One of the last lines of defense to prevent pollutants from entering the storm drain system is to catch them in the storm drain inlet. Mineart and Singh (1994) reported that monthly or even quarterly clean outs of sediment in storm drain inlets could reduce stormwater pollutant loads to the San Francisco Bay by 5% to 10%. Currently, few communities clean out their storm drain inlets more than once a year, but a more aggressive effort by public works to clean out storm drains prior to the onset of the wet season could be a viable strategy in some communities.

Better Site Design

Better site design clearly presents great opportunities to reduce impervious cover and stormwater impacts in the west, but has not been widely implemented to date. Indeed, the "California" development style, with its wide streets, massive driveways, and huge cul-de-sacs has been copied in many western communities and arguably produces more impervious cover per home or business than any other part of the country (Figure 2). While the popularity of the California development style reflects the importance of the car in shaping communities, it is also a strong reaction against the arid and semi-arid landscape. The brown landscape is not green or pastoral, and many residents consider concrete and turf to be a more pleasing and functional land cover than the dirt and shrubs they replace.

While the techniques and benefits of better site design have been extensively profiled in the last issue of *Techniques* (3:2), it is worth discussing how these techniques can be adapted for western developments.

A key adaptation is to incorporate the concept of "stormwater harvesting" into residential and commercial development design (COT, 1996). Water harvesting is an ancient concept that involves capturing runoff from rooftops and other impervious surfaces and using it for drinking water or to irrigate plants (e.g., the cistern). In a more modern version, rooftop runoff is spread over landscaping areas or the yard, with the goal for complete disposal of runoff on the property for storm events up to the two-year storm (which ranges from one to two inches in most arid and semi-arid climates. For example, the City of Tucson recommends 55 gallons of storage per 300 to 600 square feet of rooftop for residential bioretention areas (COT, 1996). In higher density settings, it may be more practical to store water in a rain barrel or cistern for irrigation use during dry periods.

When water harvesting is aggressively pursued, stormwater runoff is produced only from the impervious surfaces that are directly connected to the roadway system. Denver has utilized a similar strategy program to disconnect impervious areas and reduce the amount of stormwater pollution (DUDFC, 1992). A useful guide on these techniques has also been produced for the San Francisco Bay area (BASMAA, 1997). Water harvesting may also prove to be a useful stormwater retrofitting strategy, particularly in regions where water conservation is also a high priority.

Better site design principles also need to be adapted for fire safety in Western communities adjacent to chaparral vegetation that are prone to periodic wildfires. In some case, vegetation setbacks must be increased in these habitats to protect developments from dangerous wildfires (CWP, 1998).

Developing Western Stormwater Practices

Given the many challenges and constraints that arid and semi-arid watersheds impose, managers need to adapt and modify stormwater practices that were originally developed in humid watersheds. In our stormwater managers survey, four recurring principles emerged on how to design "western" stormwater practices that are suited to the challenging climate and water resource problems of arid and semi-arid watersheds:

1. Carefully select and adapt stormwater practices for arid watersheds
2. Minimize irrigation needs for stormwater practices
3. Protect groundwater resources and encourage recharge

Table 3. Stormwater Pollutant Event Mean Concentrations in Arid and Semi-Arid Regions (Units: mg/l, except for metals which are in ug/l)

Pollutant	National	Phoenix, AZ	Boise, Idaho	Denver, Colorado	San Jose, California	Dallas, Texas
Source	(1)	(2)	(3)	(4)	(5)	(6)
Rainfall		7.1 inches	12 inches	13 inches	14 inches	28 inches
N	2-3000	40	15	35	67	32
TSS	78.4	227	116 *	384	258	663
BOD	14.1	109	89	nd	12.3	12
COD	52.8	239	261	227	nd	106
Total N	2.39	3.26	4.13	4.80	nd	2.70
Total P	0.32	0.41	0.75	0.80	0.83 #	0.78
Soluble P	0.13	0.17	0.47	nd	nd	nd
Copper	14	47	34	60	58	40
Lead	68	72	46	250	105	330
Zinc	162	204	342	350	500	540

References: (1): Smullen and Cave, 1998, (2) Lopes et al, 1995 (3) Kjelstrom, 1995 (computed) (4) DRCOG, 1983, (5) WCC, 1992 (computed) (6) Brush et al, 1995.
Notes: nd= no data, # = small sample size * = outfall pipe samples

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4. Reduce downstream channel erosion and protect from upland sediment

1. Carefully select and adapt stormwater practices for arid watersheds

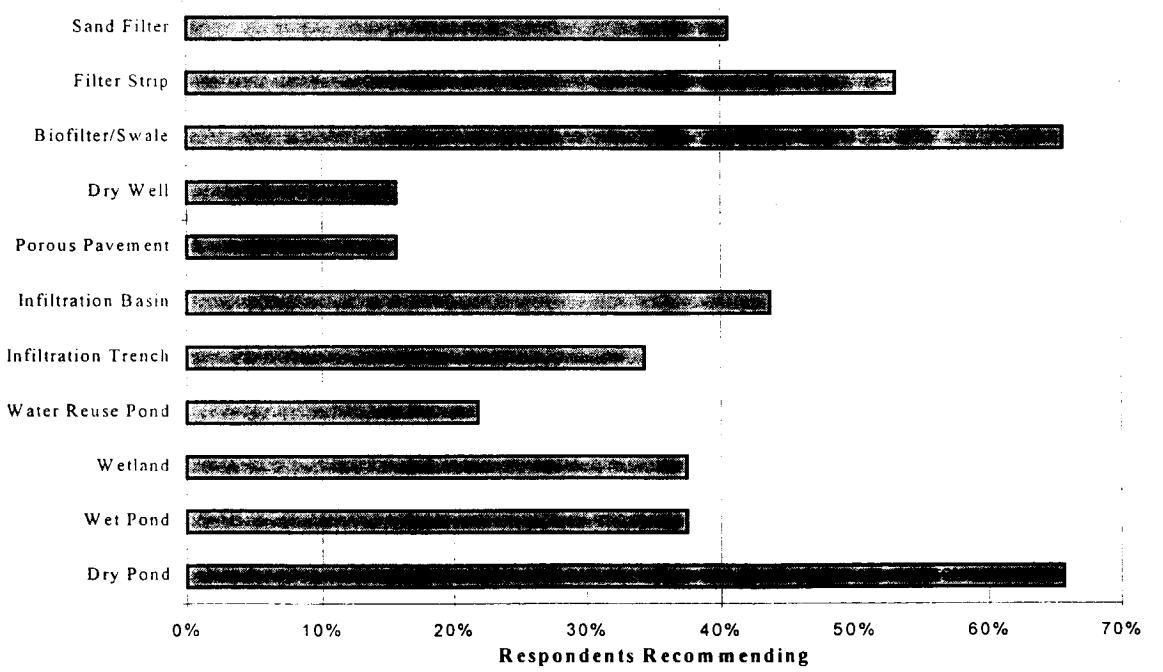
Some stormwater practices developed in humid watersheds are simply not applicable to arid watersheds, and most others require major modifications to be effective (Table 4). Even in semi-arid watersheds, design criteria for most stormwater practices need to be revised to meet performance and maintenance objectives. The following section highlights some of the major design and performance differences to consider for major stormwater practices.

Extended Detention (ED) Dry Ponds. The most widely utilized stormwater practices in arid and semi-arid watersheds were dry ponds, according to the Center's survey (Figure 3). Most were designed exclusively for flood control, but can be easily modified to provide greater treatment of stormwater quality. While dry ED ponds are not noted for their ability to remove soluble pollutants, they are reasonably effective in removing sediment and other pollutants associated with particulate matter (see *Technical Note* 95). In addition, ED ponds can play a key role in downstream channel protection, if the appropriate design storm is selected, and adequate upstream pretreatment is incorporated. Dry extended detention is the most feasible pond practice in arid watersheds, since they do not require a permanent pool of water.

Wet Ponds. Wet ponds are often impractical in arid watersheds since it is not possible to maintain a permanent pool without supplemental water, and the ponds become stagnant between storms. Wet ponds are feasible in some semi-arid watersheds, on the other hand, when carefully designed. Performance monitoring studies have demonstrated that wet ponds exhibit greater pollutant removal than other stormwater practices in Austin, Texas, at a lower cost per volume treated (COA, 1998, and *Technical Note* XX). In arid and semi-arid climates, wet ponds can require supplemental water to maintain a stable pool elevation. Saunders and Gilroy (1997) reported that 2.6 acre-feet per year of supplemental water were needed to maintain a permanent pool of only 0.29 acre-feet. Generally speaking, stormwater designers working in semi-arid watersheds should design for a variable pool level that can have as much as a three-foot draw down during the dry season. The use of wetland plants along the pond's shoreline margin can help conceal the drop in water level, but managers will need to reconcile themselves to chronic algal blooms, high densities of aquatic plants and occasional odor problems. The City of Austin has prepared useful wet pond design criteria to address these issues (COA, 1997).

Stormwater Wetlands. Few communities recommend the use of stormwater wetlands in either arid or semi-arid watersheds. Once again, the draw down rates caused by evaporation make it difficult to impossible to maintain standing water that can sustain emergent wetland plants, unless copious subsidies of supplemental water

Figure 3: BMP Preferences in Arid Climates



are supplied. One interesting exception was a gravel-based wetland that treated parking lot runoff in Phoenix, Arizona (Wass and Fox, 1995). While the wetland did require some supplemental water, evaporation was reduced by the overlying gravel bed, and the wetland achieved relatively high removal rates of oil and grease.

Sand Filters. Sand filters continue to be one of the most common practices used to treat the quality of stormwater in both arid and semi-arid watersheds. Sand filters require no supplemental water and can be used with almost any soil type. Still, the basic sand filter design continues to evolve to counter the tough design conditions found in these regions. For example, Urbonas (1997) evaluated sand filter performance in Denver, Colorado, and concluded that designs need to be modified to account for the greater sediment buildup in arid regions (*Technical Note* 100). Urbonas found that the

Table 4. Design Modifications for Stormwater Practices in Arid and Semi-Arid Watersheds

Stormwater Practice	Arid Watersheds	Semi-Arid Watersheds
ED Dry Ponds	PREFERRED multiple storm ED stable pilot channels "dry" forebay	ACCEPTABLE dry or wet forebay needed
Wet Ponds	NOT RECOMMENDED evaporation rates are too high to maintain a normal pool without extensive use of scarce water	LIMITED USE liners to prevent water loss require water balance analysis design for a variable rather than permanent normal pool use water sources such as AC condensate for pool aeration unit to prevent stagnation
Stormwater Wetlands	NOT RECOMMENDED evaporation rates too great to maintain wetland plants	LIMITED USE require supplemental water submerged gravel wetlands can help reduce water loss
Sand Filters	PREFERRED requires greater pretreatment exclude pervious areas	PREFERRED refer to COA, 1997 for design criteria
Bioretention	MAJOR MODIFICATION no irrigation better pretreatment treat no pervious area xeriscape plants or no plants replace mulch with gravel	MAJOR MODIFICATION use runoff to supplement irrigation use xeriscaping plants avoid trees replace mulch with gravel
Rooftop Infiltration	PREFERRED dry well design for recharge of residential rooftops	PREFERRED recharge rooftop runoff on-site unless the land use is a hotspot
Infiltration	MAJOR MODIFICATION no recharge for hotspot land uses treat no pervious area multiple pretreatment soil limitations	MAJOR MODIFICATION no recharge for hotspot land uses treat no pervious area multiple pretreatment
Swales	NOT RECOMMENDED not recommended for pollutant removal, but rock berms and grade control needed for open channels to prevent channel erosion	LIMITED USE limited use unless irrigated rock berms and grade control essential to prevent erosion in open channels

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test sand filter quickly became clogged with sediment after just a few storms, and recommended that sand filters include a more frequent sediment clean out regime, an increase in the filter bed size, and upstream detention to provide greater sediment pretreatment. Some additional research on the performance and longevity of sand filters in the semi-arid climate of Austin, Texas can be found in *Technical Notes* 111 and 112 (this issue).

Bioretention. The use of bioretention as a stormwater treatment practice is not very common in many western communities at the present time. Clearly, this practice will require extensive modification to work in arid watersheds. This might entail xeriscape plantings, use of gravel instead of mulch as ground cover, and better pretreatment. Sprinkler irrigation of bioretention areas should be avoided.

Infiltration Practices. While a number of communities allowed the use of infiltration in arid and semi-arid watersheds, few encouraged its use. Two concerns were frequently cited as the reason for lack of enthusiasm for structural infiltration. The first concern was that infiltration practices are too susceptible to rapid clogging, given the high erosion rates that are customary in arid and semi-arid watersheds. The second concern was that untreated stormwater could potentially contaminate the aquifers that are used for groundwater recharge.

Swales. The use of grass swales for stormwater treatment was rarely reported for arid watersheds, but was much more common in semi-arid conditions. Grass swales are widely used as a stormwater practice in residential developments in Boise, Idaho, but the dense turf can only be maintained in these arid conditions through the use of sprinkler irrigation systems. The pollutant removal performance of swales in arid and semi-arid watersheds appears to be mixed (Table 5). Poor to negative pollutant removal performance was reported in a Denver swale that was not irrigated (Urbonas, 1999 -personal communication). In the semi-arid climate of Austin, Texas, Barret et al (1998) reported excellent pollutant removal in two highway swales that were vegetated but not irrigated. Similar performance was also noted in a non-irrigated swale monitored by the City of Austin (COA, 1997).

2. Minimize irrigation needs for stormwater practices

In arid climates, all sources of water, including stormwater runoff, need to be viewed as a resource. It seems senseless, therefore, to irrigate a practice with 50 inches of scarce water a year so that it can be ready to treat the stormwater runoff produced from 10 inches of rain a year. Still, irrigation of stormwater practices the 183 and Walnut Creek sites. In our survey of stormwater managers, 65% reported that irrigation was commonly used to establish and maintain vegetated cover for most stormwater practices.

Irrigation should be limited to practices that meet some other landscaping or recreational need in a community and would be irrigated anyway, such as landscaping islands in commercial areas and road rights of way. Irrigation may also be a useful strategy for dry ED ponds that are designed for dual use, i.e., facilities that serve as a ballfield or community park during the dry season. Even when irrigation is used, practices should be designed to "harvest" stormwater, and therefore reduce irrigation needs. Landscapers should also consider planting native drought resistant plant material to

Table 5. Performance of Vegetated Swales in Semiarid Climates
Source: Barret et al, 1997, and COA, 1998

	Highway 183 median	Walnut Creek	City of Austin Swale
Parameter	Mass Load Reduction (%)		
TSS	89	87	68
COD	68	69	33
TP	55	45	43
TKN	46	54	32
Nitrate	59	36	(-2)
Zinc	93	79	ns
Lead	52	31	ns

ns = not sampled. Fecal coliform and fecal strep removals were negative at the 183 and Walnut Creek sites.

reduce water consumption.

3. Protect groundwater resources and encourage recharge

In many arid communities, protection of groundwater resources is the primary driving force behind stormwater treatment. Ironically, early efforts to use stormwater to recharge groundwater have resulted in some groundwater quality concerns. In Arizona, for example, stormwater was traditionally injected into 10 to 40 foot deep dry wells to provide for groundwater recharge. Concerns were raised that deep injection could increase the risk of localized groundwater contamination, since untreated stormwater can be a source of pollutants, particularly if the proposed land use is classified as a stormwater hotspot.

Wilson et al (1990) evaluated the risk of dry well stormwater contamination in Pima County, Arizona, and determined that dry wells had elevated pollutant concentrations in local groundwater. The build up of pollutant levels that had occurred over several decades tended to be localized, and did not exceed drinking water standards. Still, it is important to keep in mind that dry wells and other injection recharge methods should only be used to infiltrate relatively "clean" runoff, such as residential roofs. Other surface infiltration practices, such as trenches and basins, can also potentially contaminate groundwater unless they are carefully designed for runoff pretreatment, provide a significant soil separation distance to the aquifer, and are not used on "hot spot" runoff sites.

In many arid communities, protection of groundwater resources is the primary driving force behind stormwater treatment.

4. Design to reduce channel erosion

Above all, the western stormwater practice must be designed to reduce *downstream* erosion in ephemeral channels, while at the same time protecting itself from sediment deposition from *upstream* sources. This is a daunting challenge for any engineer, but the following ideas can help.

With respect to *downstream channel erosion*, designers will need to clamp down on the storm events that produce active erosion in channels. This might entail the design of ponds or basins that can provide 12 hours of extended detention for the one-year return interval storm event (which is usually no more than an inch or two in most arid and semi-arid watersheds). Local geomorphic assessment will probably be needed to set channel protection criteria, and these hydraulic studies are probably the most critical research priority in both arid and semi-arid watersheds today. Without ED channel protection, designers must rely on clumsy and localized engineering techniques to protect ditches and channels from eroding, such as grade control, rock berms, rip-rap, or even concrete lined channels. Bioengineering options to stabilize downstream channels in arid watersheds are limited, and often require erosion control blankets to retain moisture and seeds, as well as extensive irrigation.

Upstream erosion quickly reduces the capacity of any stormwater practice in an arid or semi-arid watershed, due to sparse vegetation cover and erosion from upstream gullies, ditches, or channels. Designers have several options to deal with this problem. The most effective option is to locate the practice so that it can only accept runoff from impervious areas, particularly for infiltration, sand filters and bioretention. Even then, the practice will still be subject to sediment transported by the wind.

All stormwater practices in arid and semi-arid watersheds require greater pretreatment *than in humid watersheds.* Seventy percent of the arid stormwater managers surveys reported that sediment clogging and deposition problems were a major design and maintenance problem for nearly all of their stormwater practices.

Even though not all upstream erosion can be prevented, designers can compensate for sediment buildup within the stormwater practice itself. Pretreatment and over-sizing can prevent the loss of storage or clogging associated with sediment deposition. As noted in *Technical Note* 112, rock berms or vertical gravel filters are ideally suited as a pretreatment device.

Most stormwater managers surveyed indicated that sediment cleanout regimes for stormwater practices need to be more frequent in arid and semi-arid watersheds, with removal after major storms and at a minimum, once a year. Lastly, stormwater managers consistently emphasized the need for better upland erosion control during construction. A full 65% of the managers reported that upstream erosion and sediment control was a major emphasis during their stormwater plan review.

Summary

It is clear that stormwater managers in arid and semi-arid climates cannot simply import the stormwater programs and practices that were originally developed for humid watersheds. Instead, they will need to develop stormwater solutions that combine aggressive source control, better site design and stormwater practices in a distinctly western context. Regulators, in turn, need to recognize that western climates, terrain and water resource objectives are different, and be flexible and willing to experiment with new approaches in municipal stormwater programs. Lastly, stormwater managers from arid and semi-arid watersheds must

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work more closely together to share experiences about the stormwater solutions that work and fail. It is only through this dialogue that western communities can gradually engineer stormwater practices that are rugged enough to withstand the demanding challenges of the arid and semi-arid west.

References

Barret, M., M. Keblin, P. Walsh. , J. Malina and R. Charbeneau. 1998. *Evaluation of the performance of permanent runoff controls: summary and conclusions.* Center for Transportation Research. Texas Dept of Transportation. University of Texas. Austin, TX. 37 pp.

Brush, S, M. Jennings, J. Young, and H. Mcreath. 1995. *NPDES monitoring–Dallas/Forth Worth Texas area.* pp. 115-143. In *Stormwater NPDES Monitoring Needs.* American Society of Civil Engineers.

Camp Dresser and McKee (CDM), Larry Walker Associates, and Uribe and Associates, and Resources Planning Associates. 1993. *California stormwater best management practices handbook.* Prepared for: California Water Quality Control Board. Sacramento, CA

Caraco, D. 1997. *BMP supplement for cold climates.* U.S. Environmental Protection Agency. Center for Watershed Protection. Ellicott City, MD. 112 pp.

Center for Watershed Protection (CWP). 1997. *Survey of stormwater managers in arid and semi-arid climates.* Ellicott City, MD, Unpublished data.

City of Austin (COA). 1994. *Environmental criteria manual: guidelines for BMP design.* City of Austin Drainage Utility. Austin, TX.

City of Austin, (COA) 1997. Wet Ponds. Section 1.6.6.C of *Environmental Criteria Manual.* City of Austin, TX Drainage Utility.

City of Tucson (COT) Stormwater Quality Program. 1996. *Water harvesting fact sheets.* Tucson, AZ.

Claytor, R. and T. Schueler. 1997. *Design of stormwater filtering systems.* Prepared for: Chesapeake Research Consortium. Center for Watershed Protection. Ellicott City, MD.

Denver Regional Council of Governments (DRCOG). 1983. *Urban runoff quality in the Denver region.* Prepared for US EPA NURP Program. Denver, CO. 240 pp.

Glick, R., G. Chang and M. Barret. 1998. *Monitoring and evaluation of stormwater quality control basins.* Water Environment Federation Speciality Conference. Proceedings Watershed Management: Moving from Theory to Implementation. Denver, CO. May 3-6, 1998.

Guay, J. 1996. *Effects of increased urbanization from 1970's to 1990's on storm runoff characteristics in Perris Valley, California.* USGS Water Resources Investigations Report. 95-4273.

Harris, T., J. Saunders, and. W. Lewis. 1997. *Urban rivers in arid environments–unique ecosystems.* Pp. 421-438 In *Effects of Watershed Development and Management of Aquatic Ecosystems.* L. Roesner, editor. American Society of Civil Engineers. New York, NY.

Kjelstrom, L. 1995. *Data for and adjusted regional regression models of volume and quality of urban stormwater runoff in Boise and Garden City, Idaho, 1993-94.* United States Geological Survey Water Resources Investigations Report 95-4228.

Lopes, T, K. Fossum, J. Phillips and J. Marical. 1995. *Statistical summary of selected physical, chemical, and microbial contaminants and estimates of constituent loads in urban stormwater in Maricopa County, Arizona.* USGS Water Resources Investigations Report 94-4240.

Maddock, T. and W. Hines. 1995. *Meeting future public water supply needs: a Southwest perspective.* Water Resources Bulletin, 31(2): 317-329

Mizell, S. and R. French. 1995. *Beneficial use of dry weather flow in the Las Vegas Valley, Nevada. Water Resources Bulletin.* 31(3): 447-461.

National Oceanographic and Atmospheric Administration (NOAA). 1997. *NCDC Summary of the day weather records.* Silver Spring, MD.

Saunders and Gilroy. 1997. *Treatment of nonpoint source pollution with wetland/aquatic ecosystem best management practices.* Texas Water Development Board. Lower Colorado River Authority. Austin, TX

Smullen, J, and K. Cave. 1998. *Updating the U.S. nationwide urban runoff quality database pp 202-218 in Conference Proceedings.* Third International Conference on Diffuse Pollution. International Association of Water Quality. Edinburgh, Scotland.

BOARD OF SUPERVISORS
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CHAIRMAN OF THE BOARD
SUPERVISOR, FOURTH DISTRICT

September 15, 1999

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

STANDARD URBAN STORMWATER MITIGATION PLANS
NUMERICAL STANDARDS

One of the conditions of the Municipal National Pollutant Discharge Elimination System (NPDES) Permit (Permit) issued to Los Angeles County as Principal Permittee and 85 Permittee Cities, is the submittal of Standard Urban Stormwater Mitigation Plans (SUSMPs). The approval of the SUSMPs is to be discussed at the Regional Board Public Hearing on September 16. As part of the approval process, your staff has recommended that the SUSMPs have a numerical mitigation standard added before they are formally approved. A number of Cities are opposing the incorporation of numerical standards into the SUSMPs because this could lead to the implementation of measures, which are not proven and may not be cost effective.

As Principal Permittee of the NPDES Permit, the County has worked with the 85 Permittee Cities to develop SUSMPs through a consensus process that included input from all the Permittees. Although the County's and the Permittees' SUSMPs differ because the County has chosen to include a standard with respect to this part of our stormwater program, we believe that the SUSMPs represent a reasonable and practicable program for all Permittees.

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The County continues to undertake a very proactive approach toward water quality issues by implementing programs to protect the beneficial uses of waterbodies in the County and to reduce pollutants in stormwater to the maximum extent practicable. Although many Cities share the same stormwater quality issues, their approach to solving problems varies based on the wide range of issues within each City. Therefore, we support the Cities' approach to implementing the SUSMPs, thus allowing the flexibility for each City to determine what is reasonable and practicable within its own jurisdiction.

Sincerely,

DON KNABE
Chairman of the Board
Supervisor, Fourth District
County of Los Angeles

c: Department of Public Works

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
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HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
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ALHAMBRA, CALIFORNIA 91802-1460

January 26, 2000

IN REPLY PLEASE REFER TO FILE: EP-3

Mr. Dennis A. Dickerson
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

STANDARD URBAN STORMWATER MITIGATION PLANS

We have reviewed your "Comments Received and Response - Supplement" and your "Change Sheet" both dated January 21, 2000, as well as the "Change Sheet" dated January 25, 2000. Although the majority of our comments from our December 28, 1999, letter have been addressed, we still have serious concerns with some of our comments that were not addressed and some of the new changes that you have made to the Standard Urban Stormwater Mitigation Plan (SUSMP). The following are our comments that we would like you to consider.

Comments From Our December 28, 1999, Letter Not Addressed:

SUSMP Categories

Although you have clarified the definitions of parking lots and projects discharging into environmentally sensitive areas, the two additional categories are nearly identical to project characteristics that are already identified as priority projects in the Development Planning Program. The priority project categories identified in Part B of the checklist includes project locations adjoining, bisected by, or directly discharging to a designated environmentally sensitive area, riparian corridor or wetland and parking lots with greater than 200 parking spaces for any office, commercial, or industrial use. The mention of these categories in a different manner in multiple components of the Development Planning program documents will lead to confusion.

Definitions

Hillside: The definition of hillside was revised to only partially address our concern. We still recommend changing the definition to read, "Property located in an area with known erosive soil conditions, where the development contemplates regulated grading on any natural slope that is 25 percent or greater." The municipalities only have the authority to implement the program on regulated grading.

Environmentally Sensitive Area: You have simply added references here for Areas of Special Biological Significance and Area of Ecological Significance. Your proposed definition of "Environmentally Sensitive Area" would still be very difficult to implement and enforce. We still recommend that these areas be defined as those adjoining, bisecting, or directly discharging to a Significant Ecological Area, identified by Los Angeles County or other environmentally sensitive areas identified by the local jurisdiction. This definition would provide clarity and be more consistent with that given in the Model Program. It would also be enforceable and have a reasonable basis.

Sections 6 and 7 of the General Requirements

Though you have exempted individual, single-family residential developments from the requirements of (Section 7) covering trash storage areas; you did not exempt the same from the requirements of (Section 6) covering outdoor material storage areas. An exemption, in that case, is appropriate as well.

Roofing Surface Exclusion

The wording of Part D was revised to read, "The storm water conveyance system does not directly discharge to a natural stream or a channel segment scheduled for restoration." We still recommend adding "to a natural stream" following restoration. This will help clarify what is meant by restoration. Also, you have added a statement at the beginning of the Roofing Surface Exclusion that reads, "A proportional area of roofing surface may be excluded..." This statement is vague and needs clarification.

Parking Lots

To address our earlier concern, you have now revised this section to require all the listed Best Management Practices (BMPs). As we stated earlier, these should be recommendations because it will not be possible, and is probably not necessary, to meet all these requirements on any one parking lot. For example, requiring the reduction of impervious land coverage **and** infiltration of runoff **and** treatment of runoff for parking lots seems to be excessive. Also, this section is redundant to the runoff mitigation requirements shown earlier in the SUSMP for the new parking lot category. This redundancy and overlap will make implementation of the SUSMP for this type of project confusing.

Concerns With the New Comments That Have Been Added:

Section 2 (Conserve Natural Areas) of the General Requirements

You have removed the "Every effort shall be made to" from the first requirement of this section. This eliminates the flexibility for situations where it is not feasible to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition. This statement should be left at the beginning of the first requirement of this section.

Section 3 (Minimize Storm Water Pollutants of Concern) of the General Requirements

You have changed a portion of the definition of Pollutants of Concern by replacing "at a level high enough to be" with "concentrations or loads." The original definition of Pollutants of Concern was taken verbatim from our Stormwater Permit and therefore would create a conflict between the Permit and the SUSMP. We recommend leaving the definition as stated in the Permit.

Section 4 (Protect Slopes and Channels) of the General Requirements

You have added text that reads, "Utilize natural drainage systems to the maximum extent practicable." It is unclear what utilization means in this instance.

Section 8 (Provide Proof of Ongoing BMP Maintenance) of the General Requirements

You changed text regarding transfer of property to apply to a private or public owner. It is unclear as to why this addition is needed. The owner will always be a private or public owner. Therefore, this added text is not needed.

If you have any questions, please call me at (626) 458-5948, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Tim Piasky for

Terri M. Grant
Supervising Civil Engineer III
Environmental Programs Division

TP:sv

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cc: All Permittees
City of Long Beach
CRWQCB (David Nahai)

COUNTY OF LOS ANGELES

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January 11, 2000

IN REPLY PLEASE
REFER TO FILE: EP-3

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
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Dear Mr. Dickerson:

MUNICIPAL STORMWATER PERMIT NO. CAS614001 - ORDER NO. 96-054
STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPs)

In response to your request at our meeting on December 30, 1999, we are providing the following information regarding our early experiences with the implementation of the 0.75-inch rainfall standard (standard) contained in the County of Los Angeles Development Planning Implementation Manual. To date, our experience is limited to the preliminary approval of projects. However, we have already identified several issues and concerns that need our attention at this early stage to ensure successful implementation of this new program.

In order to develop the standard, we reviewed and evaluated the new development stormwater pollution prevention programs of several other municipalities in California and throughout the country. Because we were negotiating our program under a Settlement Agreement with the Natural Resources Defense Council, we also considered information provided by them in this process. Lastly, we referenced the California Best Management Practices (BMPs) Handbook and the Urban Runoff Quality Management Manual (WEF Manual of Practice No. 23 and ASCE Manual and Report on Engineering Practice No. 87)

The Manual suggests that capturing and treating runoff from "smaller" storms will result in capture and treatment of a large percentage of the runoff volume from the urban landscape. A water quality BMP capable of capturing these smaller storms would also capture and treat the "first flush" portion of the larger, infrequently occurring runoff events. The Manual indicates that the 80th percentile runoff event is considered by municipalities in the semiarid region of the United States to be cost effective for stormwater quality management and is viewed as the design event that achieves the Maximum Extent Practicable definition under the Clean Water Act.

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We found much variation in the standards adopted by municipalities for new development and the desired goals of their programs. For example, the standard was described in various terms such as, rainfall, runoff, or one to five-year frequency storms. Some programs focused on restoring the population of a particular endangered species while others sought to prevent major erosion problems. Municipalities adopted standards both lower and higher than the 80th percentile.

In order to establish an appropriate standard for treatment in Los Angeles County, we evaluated 119 years of rainfall data from our downtown Los Angeles area, Rain Gage No. 716. Using this data, we were able to create a rainfall probability graph. This rainfall probability graph showed that 85 percent of our storm events are less than or equal to 0.75-inches. Therefore, based on our research, we determined 0.75-inches of rainfall to be a reasonable standard for the mitigation of stormwater runoff.

0.75-Inch Volume and Flow Rate Calculations

Our most notable obstacle, thus far, has been the correct or proper calculation of runoff volume at a specific site. There are various methods to determine the appropriate volume and flow rate for structural Best Management Practices (BMPs), but no two methods give identical results. It has been a challenge to determine the most appropriate Countywide method. This challenge arises from trying to determine design volumes and flow rates when the only hydrology data analysis available is for a 10, 25, and 50-year peak flow design storm. Without design volumes and flow rates for the standard, we have limited confidence in the design of the stormwater BMPs. Therefore, we are challenged to refocus our hydrology expertise to change our previous design analysis from large peak-flow storm events to smaller more frequent events.

Knowledge of BMPs

Many of the proposed structural BMPs have been inadequate for their respective project. Some of the proposed BMPs are not properly situated and others would not adequately treat the stormwater runoff. Though we have been commenting on the proposals and discussing them with the proponents, we are unsure if these inadequate proposals are due to a lack of economically viable solutions or a lack of knowledge on the development community's part.

Infiltration BMPs

Fortunately, a number of the projects are located in areas of the County where infiltration rates are higher and proposed infiltration BMPs should be able to meet the standard.

However, we do not have verification of these high infiltration rates, and we are requiring a soils test for those projects proposing infiltration BMPs. We believe these more porous soils are unique to undeveloped County unincorporated areas and may not be representative of much of Los Angeles County.

Two home subdivision projects are proposing the infiltration of stormwater on individual residential lots. Though the anticipated soil infiltration rate is reported to be approximately three-inches per hour and well able to meet the standard, it is possible that individual homeowners in the future could modify their property to render the proposed BMPs ineffective. On another project the developer proposed to use designed infiltration basins, as well as the porous natural unlined channel, to mitigate the runoff from streets, driveways, and other impervious surfaces. We do not view the channel as meeting the criteria of an infiltration BMP. A third project, a 100+ home subdivision and golf course, is proposing to infiltrate a majority of its runoff throughout a golf course, but the ability of the golf course to infiltrate the runoff is yet to be determined.

BMP Maintenance Task Force

For all projects, we have not determined how maintenance of the proposed BMPs will be provided, though one project plan stated that the BMPs will be maintained by a home owner's association. Now that we know more about the type of BMPs developers are likely to propose, we are concerned about the ability of private property owners to provide continued and proper maintenance either individually or through a homeowner's association. Without proper maintenance, we believe many of the BMPs could fail to function properly and become public nuisances.

Consequently, the County has created a Task Force comprised of a few permittee cities, County staff, and residential tract developers. This Task Force will research and identify structural BMPs that the County can maintain to target the appropriate pollutants of concern, provide consistency and meet the standard. The Task Force will also consider methods of funding continual maintenance, such as the establishment of a "Storm Water Quality Maintenance District."

In summary, our brief experience has demonstrated that many issues surrounding the 0.75-inch rainfall standard need to be resolved before the program is fully effective and easily implemented. We are committed to find workable solutions in a timely manner and will be prepared to share the knowledge gained from our experiences with the other Permittees should they implement similar programs.

If you have any questions, please contact Terri Grant at (626) 458-4014, Monday through Thursday, 7:00 a.m. to 5:00 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Donald L. Wolfe
Assistant Director

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December 28, 1999

IN REPLY PLEASE REFER TO FILE: EP-3

Mr. Dennis A. Dickerson
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

STANDARD URBAN STORMWATER MITIGATION PLANS

The Los Angeles County Department of Public Works appreciates the challenge that the California Regional Water Quality Control Board, Los Angeles Region, has in trying to address the numerous and varied comments submitted on the Standard Urban Stormwater Mitigation Plans (SUSMPs). However, we have a serious concern that some of the recent changes either conflict with the already approved Model Program or are a major departure from the Development Planning Program that was negotiated and envisioned for the current National Pollutant Discharge Elimination System (NPDES) permit. The following are our comments that we would like you to consider before the January hearing.

SUSMP Categories

The two additional categories, parking lots and projects discharging into an "environmentally sensitive" area, are project characteristics that are already identified as priority projects in the Development Planning Program. The priority project categories identified in Part B of the checklist includes project locations adjoining, bisected by, or directly discharging to a designated environmentally sensitive area, riparian corridor or wetland and parking lots with greater than 200 parking spaces for any office, commercial or industrial use.

Also, the proposed SUSMP indicates that "each Permittee will approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements." This is not consistent with the Model Program. The Model Program clearly states that the Urban Storm Water Mitigation Plans will be required for specific projects when SUSMPs are not appropriate and/or not adequate for the specific project in review. "For a Planning Priority Project, the respective SUSMP or the site-specific Urban Storm Water Mitigation Plan will be incorporated into the project design prior to the issuance of any grading or building permits." The statement in the SUSMP should be revised to be consistent with the wording in the Model Program.

Definitions

Hillside: The definition of hillside would include all development. Only the extremely rare case of a dead flat lot would not be defined as "hillside." We recommend changing the definition to read "property located in an area with known erosive soil conditions, where the development contemplates regulated grading on any natural slope that is 25 percent or greater." This is the minimum grade used by most jurisdictions to define "hillside."

Environmentally Sensitive Area: Your proposed definition of "Environmentally Sensitive Area" would be very difficult to implement and enforce. We recommend that these areas be defined as those adjoining, bisecting, or directly discharging to a Significant Ecological Area, identified by Los Angeles County or other environmentally sensitive areas identified by the local jurisdiction. This definition would provide clarity and be more consistent with that given in the Model Program. It would also be enforceable and have a reasonable basis.

Redevelopment: Your proposed definition of redevelopment would require extremely minor projects to have the entire site come into compliance with stormwater regulations. This would place an unreasonable financial burden on small businesses, as well as the municipalities. It is common practice for regulations to contain thresholds to determine when new requirements are to be imposed on existing improvements. We recommend defining redevelopment as "the addition, to an already developed site of 50 percent or more impervious area or improvements to 50 percent or more of the existing improvements on the site."

Section 3 of the General Requirements

You deleted a line that recognized the possibility that other Best Management Practices (BMPs) not mentioned in the listed documents may meet the goal of the program. We recommend that this line remain in the SUSMP. We should not close the doors to new ideas. The real solutions are ahead of us, not behind.

Sections 6 and 7 of the General Requirements

Section 6 covers the proper design of outdoor material storage areas and Section 7 covers the proper design of trash storage areas. Both of these sections are written as requirements that apply to all SUSMP categories. We recommend that individual, single-family residential developments be exempted from these requirements.

Section 9 of the General Requirements

The phrases "each runoff event" and "each and every storm event" are creating confusion for those trying to design BMPs for that purpose. When one considers that storms may occur over several consecutive days, this statement would lead to a BMP that is over designed for water quality purposes, especially when you take ground saturation into consideration. If the standard is to remain in the SUSMP, that wording should be clarified to state that the BMP should capture runoff events smaller than or equal to the given standard.

Roofing Surface Exclusion

Part D does not allow excluding the area of the roofing surface from the total area for calculation of rainfall or runoff volume to be treated if the stormwater conveyance system directly or indirectly discharges to a natural stream or unlined channel or channel segment scheduled for restoration. An exclusion for roofing surfaces is a good idea. However, the terms "indirectly discharge" and "unlined channel" in Part D of this section could be interpreted to prevent almost all projects from meeting the exclusion criteria. The wording of Part D should be revised to read, "the storm water conveyance system does not directly discharge to a natural stream or a channel segment scheduled for restoration to a natural stream."

Parking Lots

This section is not clear as to whether or not the listed BMPs are required or recommended. We would assume that the BMPs are recommended because it may not be possible to implement each of these BMPs at all parking areas. Wording to that effect should be added to the SUSMP.

Waiver

This section should define "an underground source of drinking water" and whether or not that includes potential sources.

Alternative Certification for Storm Water Treatment Mitigation

We agree with your approach to include this section in the SUSMP, but we feel that the certification should be required to be signed by a Civil Engineer or Architect registered in the State of California. This would provide assurance that the selection and design of the BMPs was conducted with technical expertise and provide an opportunity for recourse for negligent designs.

TABLE 2

This table should be consistent with the list of BMPs approved by the Regional Board for the Development Planning Program.

If you have any questions, please call me at (626) 458-5948, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M Grant

Terri M. Grant
Supervising Civil Engineer III
Environmental Programs Division

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cc: All Permittees
City of Long Beach
CRWQCB (David Nahai)

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

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August 12, 1999

IN REPLY PLEASE
REFER TO FILE EP-3

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

STANDARD URBAN STORMWATER MITIGATION PLANS

I am writing to clarify the intended meaning of some wording in the Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted to you on July 21, 1999.

At the workshop held on August 10, 1999, regarding SUSMPs, you indicated that the following statement in the SUSMPs would be interpreted to mean that all runoff would need to be mitigated:

> "The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system".

The actual intent of that statement was to omit a numerical standard from the SUSMPs. Enclosed is a revised version of the SUSMPs to clarify the intended meaning.

If you have any questions, please call me at (626) 458-5948, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

TG:sv
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Enc.

cc: All Permittees

Post-it® Fax Note 7671	Date 8/12/99	# of pages ▶ 25
To Dennis Dickerson	From Terri Grant	
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Phone # (213) 576-6605	Phone (626) 458-5948	
Fax # (213) 576 6625	Fax (626) 458-3534	

R0069276

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high

enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by

promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)

- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)

- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)

- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)

- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be

posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
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10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

10 - 99 HOME SUBDIVISION
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 2

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. MINIMIZE STORMWATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

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- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

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- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

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5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

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Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

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STANDARD URBAN STORM WATER MITIGATION PLAN
Page 2

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5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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STANDARD URBAN STORM WATER MITIGATION PLAN
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6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 8

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Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

July 21, 1999

IN REPLY PLEASE
REFER TO FILE EP-3

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Attention Technical Support Unit

Dear Mr. Dickerson:

COMPLIANCE FILE NO. 6948
MUNICIPAL STORMWATER PERMIT NO. CAS614001 - ORDER NO. 96-054
STANDARD URBAN STORMWATER MITIGATION PLANS (SUSMPs)

Enclosed are the Standard Urban Stormwater Mitigation Plans (SUSMPs) for your review and approval. As described in the National Pollutant Discharge Elimination System Permit, Part 2.III.A.1.c, the Principal Permittee, in consultation with the Permittees shall develop SUSMPs for use during planning and permitting of Priority Projects within the following development categories.

- a 100+ home subdivision
- a 10-99 home subdivision
- a 100,000+ square-foot commercial development
- an automotive repair shop
- a retail gasoline outlet
- a restaurant
- a hillside-located single-family dwelling

In addition to including input from the Permittees in the development of these SUSMPs, we twice distributed them to environmental groups, contractors, developers, consultants and applicable trade industries for their review and considered their comments in the development of the SUSMPs.

Also enclosed is a copy of the comments submitted by the City of Los Angeles. They are being sent with the SUSMPs at the City's request.

If you have any questions, please contact Tim Piasky at (626) 458-5969, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

TP:ma
P:\ADMIN\LETTERS\SUSMP2.WPD

Enc.

cc: All Permittees

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.

- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your

project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness

associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)
- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

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- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
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- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
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- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
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- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

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Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

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- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Categorization as a commercial development of 100,000 or more square feet will be based on total impermeable area, including parking area, as opposed to lot size or building footprint.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100,000 Square Foot Commercial Development projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a

BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples, which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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AUTOMOTIVE REPAIR SHOP

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

An automotive repair shop is a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Automotive Repair Shop projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. Therefore, design plans which include fueling areas must include the following:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating

anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

9. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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Best Management Practice Guide Retail Gasoline Outlets (1997) Discusses appropriate BMPs for fueling and other closely related activities likely to be found at retail fueling operations.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

RETAIL GASOLINE OUTLET

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A retail gasoline outlet is primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

BACKGROUND

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For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. The project plans must include the following BMPs:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

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6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater run-on or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Restaurant projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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SINGLE FAMILY HILLSIDE RESIDENCE

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

"Hillside" is as defined by the local jurisdiction. For example, one jurisdiction defines "hillside" as a property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25% or greater, and where grading contemplates cut or fill slopes 30 feet high or greater.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Single-Family Hillside Residence projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to

provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

RECEIVED
JUL 14 1999
BY:.....

July 12, 1999

IN REPLY PLEASE REFER TO FILE: EP-3

Mr. Alex Helperin
Natural Resources Defense Council, Inc.
6310 San Vicente Boulevard, Suite 250
Los Angeles, CA 90048-5426

Dear Mr. Helperin:

PROPOSED STANDARD URBAN STORMWATER MITIGATION PLANS

This is in response to your June 10, 1999, letter about the Standard Urban Stormwater Mitigation Plans (SUSMPs) proposed by the Permittees. Your letter expressed concern that the Permittees are not proposing to adopt the County's Urban Stormwater Mitigation Plans (USMPs).

The SUSMPs that you recently reviewed were developed through a consensus process that included input from all the Permittees. The County's USMPs differ from the current Permittees' version of the SUSMPs because the County has chosen to meet a higher standard with respect to this part of our stormwater program, just as we have in other aspects of the program. However, it is not our role as Principal Permittee of the National Pollutant Discharge Elimination System (NPDES) permit to independently determine for the other Permittees, the Executive Advisory Committee, or the Regional Water Quality Control Board what the Countywide SUSMPs should be.

We would like to clarify your understanding of some specific aspects of the SUSMPs. First, your understanding of "impervious directly connected area" is correct. The SUSMPs do not propose to mitigate runoff from pervious areas or impervious areas that are not directly connected. Also, your letter included the phrase "capturing 80% of the stormwater runoff..." The program was actually meant to mitigate all of the stormwater runoff (infiltrate and/or treat) from 80 percent of the storm events rather than mitigating 80 percent of all stormwater runoff.

The SUSMPs propose that BMPs would mitigate runoff from 0.6 inch of rainfall as 80 percent of all storm events have historically produced 0.6 inch or less of rainfall.

Though the County's and the Permittees' SUSMPs differ, we believe that the SUSMPs represent a reasonable and "practicable" program for all the Permittees. These SUSMPs also provide the flexibility to implement Best Management Practices (BMPs) that are prudent to each cities' individual characteristics.

If you need any clarification, please call me at (626) 458-5948, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M. Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

JP:ma
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cc: Executive Advisory Committee
Development Planning/Construction Subcommittee
Regional Water Quality Control Board (Dennis Dickerson)
URS Greiner Woodward-Clyde (Bob Collacott, Barb Klos)

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ASSISTANT DIRECTORS

STORMWATER MANAGEMENT DIVISION
650 SOUTH SPRING ST. SUITE 700
LOS ANGELES, CA 90014
FAX: (213) 847-6443

June 17, 1999

Harry W. Stone, Director
Department of Public Works
County of Los Angeles
P. O. Box 1460
Alhambra, CA 91802-1460

Attn.: Terri M. Grant
Supervising Civil Engineer III
Environmental Programs Division

Dear Mr. Stone:

COMMENTS ON DRAFT STANDARD URBAN STORMWATER MITIGATION PLANS

The City appreciates the opportunity to review and comment on the proposed draft Model Standard Urban Stormwater Mitigation Plans (SUSMPs).

The City is concerned that the draft Model SUSMPs appear to be inconsistent with the requirements of the Development Planning Model Program (Model) and the Municipal Stormwater Permit. This inconsistency will create implementation difficulties for all Permittees and needs to be corrected.

The draft Model SUSMPs do not delineate the anticipated pollutants of concern associated with each development category. Evaluation of potential significant impacts associated with each land-use type would better assist Permittees in understanding the pollutants of most concern associated with each land-use category and in selecting the most appropriate Best Management Practices (BMPs). Therefore, the City requests that the draft Model SUSMPs be modified to include information regarding the specific pollutants of concern associated with each of the seven identified land-use categories.

The benefits of pollution prevention and minimization activities and policies are not addressed in the draft Model SUSMPs or provided as an incentive or option to structural considerations. In several cases pollution prevention and minimization activities could have a much more significant benefit to stormwater quality, and overall environmental quality, than any structural BMPs. The City recommends that the Model SUSMPs include appropriate source-control BMPs.

The City understands the time constraints facing all Permittees as well as the County's deadline for

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completing the Model SUSMPs by July 30, 1999. However, we feel the Model SUSMPs is an essential element of achieving stormwater pollution prevention. We request an opportunity to review and provide comments on the revised Model SUSMPs prior to finalization and submittal to the Executive Officer of Los Angeles Regional Water Quality Control Board. We are available to meet with you at your convenience.

Attached, please find the detailed comments on specific BMPs and SUSMPs for your consideration. If you have any questions, please call me or Wing Tam at (213) 847-8346 or (213) 847-5225, respectively.

Sincerely,

Gary Lee Moore, P.E.
Program Manager
Stormwater Management Program

GLM/MS/WKT:bg
H:\ENGAPROJECTS\MODEL\PLANNING\CMODELSU\COMMENT6.WPD

Attachment

cc: Barb Garrett, CLA
Maribel Marin, BPW
Judith Wilson, BOS
Frank Eberhard, CP
Lillian Kawasaki, EAD
Chris Westhoff, City Attorney
Jim Langley, BOS
Morad Sedrak, BOS
Wing Tam, BOS
Shobuz Ikbal, BOS

ATTACHMENT

CITY OF LOS ANGELES COMMENTS ON LOS ANGELES COUNTY MODEL STANDARD URBAN STORMWATER MITIGATION PLANS

SUSMPs Requirements for all "Priority Projects"

The draft Model SUSMPs and the transmitting cover letter imply that all projects which fall into the seven development categories listed in Permit Section III.A.1.c are Priority Projects and therefore require SUSMPs. The Permit defines Priority Projects as projects that have been determined to have a potential significant impact on water quality by the Building Official. The City anticipates reviewing all discretionary projects, not just those listed in Permit Section III.A.1.c, for potentially significant water quality impacts, consistent with the California Environmental Quality Act. We are unaware at this point of any water quality information that indicates that all seven development categories included in Permit Section III.A.1.c, regardless of size, previous land use, ecological sensitivity of adjacent or downstream areas, or elements included in proposed project plans, would result in a potentially significant impacts on water quality. Furthermore, depending upon those and other factors, impacts that may be identified are anticipated to vary from project to project even if they are within the same development category. Therefore, it is important that each Permittee have the ability to review discretionary projects and to mitigate significant impacts via SUSMPs.

The draft Model SUSMPs "Background" section needs to be modified to include clarifying language that preserves and reflects the discretion provided to each Permittee in determining if SUSMPs are required for Priority Projects that do not identify significant water quality impacts. The language which indicates that the SUSMPs "must be incorporated into design plans" for all development projects identified in Permit Section III.A.1.c is inconsistent with the requirements of the Permit and needs to be deleted.

Definition of New Improvement and Redevelopment

While the City agrees it is appropriate to consider redevelopment projects in the application of SUSMPs, we suggest that only those discretionary redevelopment projects with significant stormwater quality impacts be subject to stormwater control measures.

Absence of Source-control BMPs

The benefits of pollution prevention and minimization activities and policies are not addressed in the draft SUSMPs or provided as an incentive or option to structural considerations. In several cases, pollution prevention and minimization activities could have a much more significant benefit to stormwater quality and overall environmental quality, than any structural BMP. The City recommends that the Model SUSMPs include appropriate source-control BMPs.

Proposed Run-Off Reduction Requirement

The 0.6-inch rainfall reduction requirement does not demonstrate a clear nexus as to its appropriateness for all land-use types from a stormwater pollution standpoint. The City requests that the 0.6-inches of rainfall be deleted and replaced with the requirement of the Permit: "minimize, to the maximum extend practicable, the amount of stormwater directed to impermeable areas."

From an equitable standpoint, there is a need to regulate like sources equally. Requiring restaurants to reduce run-off by 0.6-inches of rainfall, while not requiring dry-cleaners, industrial facilities, public facilities, hotels, etc. to do the same appears to be arbitrary and capricious. In addition, some existing developments may have a high percentage of permeable surface, and rather than being rewarded for this progressive development planning, upon any redevelopment they will be penalized by being further required to reduce run-off, despite their previous efforts. The run-off reduction requirement would have significant impacts for those individuals proposing to develop open lots, and could ultimately impact redevelopment efforts. The City requests that the County respond to the legal "taking" issues associated with the proposed run-off reduction requirement and investigate the potential impacts of the requirement on redevelopment programs. In addition, an environmental evaluation addressing potential pollution transfer from one media to another associated with such a requirement should be undertaken.

Comments on Specific SUSMP/BMP

Reducing Post-Development Runoff: Selection of the treatment control BMPs is to be made by considering the characteristics of the land uses first. Several of the selected BMPs are not appropriate for some of the land-use categories. For example, none of the infiltration type BMPs, e.g. Permeable Pavements, Vegetated Swale, Vegetated Strips, Extended Detention Basin, etc., are to be included in the commercial facilities such as Auto Shop or Retail Gasoline Outlet because spilled hazardous material from these facilities may infiltrate ground with stormwater runoff. These and other infiltration type BMPs should be limited to non-commercial land uses where probability of contamination from spilled pollutants is low.

In addition, from an equitable standpoint, BMP requirements should be tailored to the degree of pollution potential within same category of projects based on their size or level of activities. For example, an Auto Shop that has facilities to repair 5 cars a day clearly do not contribute as much pollutant as the one that repairs 20 cars a day. For further information, please see Appendix D of the Model.

Protect Slopes and Channels: Flexibility in application of different slope stabilization and erosion control measures should be at the discretion of the Permittees, because majority of the Permittees have such requirements adopted in their building codes. Allowing Permittees to tailor their SUSMP requirements so that the BMPs do not conflict with building codes will facilitate implementation of the program.

Single Family Hillside Residence: The given definition of "hillside" significantly alters the meaning as intended in the Development Planning Model Program. This definition should be revised to conform to the Development Planning Model Program.

Properly Design Equipment/Accessory Wash Area: The second bullet doesn't state how the wash water and storm runoff is to be conveyed from the wash area. Requirements for proper connection to sanitary sewer with rain water diversion system should be added.

Properly Design Common Trash Storage Areas: (I) This requirement should only be applicable to outdoor storage of materials that have a potential to pollute stormwater. Outdoor storage of inert material would not have a significant impact on stormwater quality. (ii) The definition given for the "common area" is too broad. It should be narrowed down to include only outdoor material storage area.

Property Design Repair/Maintenance Bays: (I) First bullet should be revised as follows: "Repair/maintenance bays must be indoors or designed in such a way that doesn't allow contact with stormwater and stormwater run-on. (ii) The last sentence of the second bullet should be revised to include the statement that "Industrial Waste Discharge Permit will be required if discharge to sanitary sewer is necessary".

Properly Design Vehicle/Equipment Wash Areas: Include the requirement that wash area must prevent stormwater run-on from the surrounding area with berms or grade break or must have a rain water diversion system.

3.1 CATEGORIZATION OF DEVELOPMENT PROJECTS

Beginning June 1999, the DPW divisions that have responsibility for review of development project plans will categorize proposed projects as "Planning Stormwater Priority Projects" or "Planning Stormwater Exempt Projects" with respect to the potential for a significant effect on stormwater quality. Planning Stormwater Priority Projects shall be required to incorporate appropriate post-construction BMPs into project plans prior to the issuance of any building or grading permit.

In order to categorize a project as a Planning Stormwater Priority Project or a Planning Stormwater Exempt Project, project type, characteristics, and activities will be assessed for potential contribution to stormwater pollution. The DPW Building and Safety/Land Development Division shall conduct a screen check for projects utilizing a standardized checklist ("Priority/Exempt Checklist") that lists project type and project characteristics and activities that are believed to be significant potential contributors to stormwater pollution. The Priority/Exempt checklist that shall be used for categorizing projects as a Planning Stormwater Priority Project or a Planning Stormwater Exempt Project is shown in Figure 3-1 and included in Appendix A.

In utilizing the Priority/Exempt Checklist, a commercial or industrial development of 100,000 or more square feet shall be based on total impermeable area as opposed to lot size or building footprint. This interpretation shall be used because of the intent to manage storm water runoff from paved areas associated with buildings. A restaurant is a facility that would use the Standard Industrial Classification (SIC) code of 5812 and an automotive repair shop is a facility that would use one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Hillside development shall be defined as development having any of the following characteristics:

- location in an area known to have erosive soil conditions as identified in the *Los Angeles County Department of Public Works Hydrology/Sedimentation Manual*;
- grading on any natural slope where the natural slope is 25% or greater; or
- plans include cut or fill slopes that are 30 feet high or greater.

Since the County's Department of Regional Planning also has a fundamental role in approval of development projects, a process has been developed to incorporate the screen check for

categorizing projects as a Planning Stormwater Priority Project or a Planning Stormwater Exempt Project early in the planning stages of "discretionary"[1] projects. A flowchart depicting this process is provided as Figure 3-2.

[1] Section 15357 of the California Environmental Quality Act Guidelines defines "discretionary project" as a project which requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

FIGURE 3-1. CHECKLIST FOR CATEGORIZING PROJECTS AS PLANNING STORMWATER PRIORITY OR PLANNING STORMWATER EXEMPT

Project Name: _____

Project Location: _____

The project is a Planning Stormwater Priority Project if any of the project types listed in Part A or any of the project characteristics or activities listed in Part B are applicable.

Part A. Type of Proposed Project:	Check If Applicable
A 100+ home subdivision	
A 10-99 home subdivision	
A 100,000+ square-foot commercial or industrial development	
An automotive repair shop (SIC codes 5013, 5014, 5541, 7532-7534, and 7536-7539)	
A retail gasoline outlet	
A restaurant (SIC code 5812)	
A hillside-located single-family dwelling	

Part B. Project Characteristics or Activities:	Check If Applicable
Automotive or equipment repair and/or maintenance	
Car wash	
Automotive or equipment washing or cleaning area(s)	
Gas station or fuel dispensing	
Parking lot with 25 or more parking spaces	
Outdoor material or waste handling or storage	
Chemical handling and/or storage of petroleum products, paints, solvents, concrete, or hazardous waste	
Outdoor equipment or product fabrication including welding; cutting; sawing; metal fabrication; assembly; application of paints, coatings, or finishes; pre-cast concrete fabrication; etc.	
Outdoor areas for equipment or machinery repair and/or maintenance	
Dry cleaning factory	
Food service	
Food processing plant	
Hospitals, laboratories, or other medical facilities	
Nursery (plant materials)	
Animal slaughtering	
Animal confinement, pet care facilities, stables, kennels, etc.	
Public recreation uses such as tennis courts, swimming pools, golf courses	
10 or more dwelling units	
Hillside location	
Landscaped areas > 5 acres, including cemeteries, golf courses, etc.	
Location adjoining to, bisected by, or discharging to a designated environmentally sensitive area[2], riparian corridor, or wetland	

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[2] "Environmentally sensitive areas" may be, but not limited to, wetlands, habitats of endangered, threatened, or rare species, wildlife dispersal or migration corridors, areas of locally-designated species such as heritage trees, or locally-designated natural communities such as oak forest or coastal habitat.

III. Development Planning and Construction

A. Development Planning

Table 3 on the following page shows the summary of requirements under this section and corresponding compliance dates.

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Table 3
Development Planning Requirements and Compliance Dates

Requirement	Permit Section	Principal Permittee	Permittees	Months from Effective Date of Order (Compliance Date)	For Approval By
Develop a model system for prioritization of development projects	III.A 1.a	✓		18 (January 30, 1998)	Executive Officer
Implement a system for prioritization of development projects	III.A.1.a		✓	≤ 36 months (July 30, 1999)	N/A
Develop list of recommended BMPs for development projects (countywide guidelines)	III.A.1.b	✓		18 (January 30, 1998)	Regional Board
Develop Standard Urban Storm Water Mitigation Plans (SUSMP)	III.A.1.c	✓		6 months after Regional Board approval of countywide guidelines	Executive Officer
velop and submit a schedule of implementation for a program for planning measures consistent with the Standard Urban Storm Water Mitigation Plan (SUSMP) for priority projects	III.A.2		✓	≤ 36 months (July 30, 1999)	N/A
Develop guidelines for preparing/reviewing CEQA documents	III.A.3.a	✓		18 (January 30, 1998)	Executive Officer
Incorporate CEQA guidelines into internal procedures	III.A.3.a		✓	≤ 36 months (July 30, 1999)	N/A
Include watershed and storm water management consideration into General Plan revisions	III.A.4 3.b		✓	During General Plan revisions	N/A
Develop model program for developers	III.A.4	✓		18 (January 30, 1998)	Executive Officer
Implement developer information program	III.A.4		✓	≤ 36 months (July 30, 1999)	N/A

1. Countywide Development Planning Guidance

The Principal Permittee, in consultation with the Permittees, shall develop the following development planning guidance materials for use during planning and permitting of all development projects requiring discretionary approval:

a. A model documented system, such as a checklist, for determining priority projects as well as a list of specifically exempt projects not later that January 30, 1998. Priority and exempt projects are defined as follows:

i. Priority Projects are development and redevelopment projects requiring discretionary approval which the Building Official (or equivalent municipal authority) determines may have a potential significant effect on storm water quality.

ii. Exempt Projects are development and redevelopment projects which the Building Official (or equivalent municipal authority) determines will not have a potential significant impact on storm water quality.

The documented system shall consider location of the project with respect to designated environmentally sensitive areas and the slope and erosion potential of the site and surrounding areas.

Each Permittee shall incorporate a substantially similar system into its procedures not later than six months after commencement of its next fiscal year following approval of the of the documented system by the Executive Officer, provided, however, that such approval is issued not later than 90 days prior to the commencement of the Permittee's fiscal year. If such approval is given within 90 days of the commencement of a Permittee's fiscal year, such program shall be implemented in the second fiscal year following approval but in no event shall implementation be later than July 30, 1999.

b. A list of recommended BMPs not later than January 30, 1998. The list of BMPs shall include:

i. Site planning practices;
ii. Post-construction best management practices; and
iii. Redevelopment and infill practices.

Consideration shall be given to the type of development and the potential for storm water pollution when determining the applicability of BMPs. Cost effectiveness, ease of maintenance, and consistency with other environmental mandates may also be considered.

For developments where increased storm water discharge rates will result in an increase in downstream erosion potential, the list of recommended BMPs shall include those BMPs which can be used to maintain peak runoff rates at pre-development levels to the maximum extent feasible.

The list of recommended BMPs shall be submitted to the Regional Board for approval.

c. Standard Urban Storm Water Mitigation Plans (SUSMPs) and guidelines for their preparation not later than six months after Regional Board approval of the BMPs in Part 2.III.A.1.b. The SUSMPs shall incorporate the appropriate elements of the recommended BMPs list. At the minimum, SUSMPs and guidelines shall be prepared for the following development categories:

i. a 100+ home subdivision;
ii. a 10-home subdivision;
iii. a 100,000+ square-foot commercial development;
iv. an automotive repair shop;
v. a retail gasoline outlet;
vi. a restaurant; and
vii. a hillside-located single-family dwelling.

2. Planning Control Measures

Each Permittee shall develop a program on planning control measures for priority projects (Part 2.III.A.1.a) consistent with the programs developed under Part 2.III.A.1.b. & c.. Each Permittee shall initiate implementation of its program not later than six months after commencement of its next fiscal year following approval of the model Standard Urban Storm Water Mitigation Plans by the Executive Officer, provided, however, that such approval is issued not later than 90 days prior to the commencement of the Permittee's fiscal year. If such approval is given within 90 days of the commencement of a Permittee's fiscal year, such program shall be implemented in the second fiscal year following approval but in no event shall implementation be initiated later than July 30, 1999. Each Permittee shall require that the project applicant submit an Urban Storm Water

Mitigation Plan appropriate and applicable to the project, and that the Permittee approve the Plan prior to the issuance of any grading or building permit. The Urban Storm Water Mitigation Plan shall incorporate by detail or reference appropriate post-construction BMPs to:

a. Implement, to the maximum extent practicable, requirements established by appropriate governmental agencies under CEQA, Section 404 of the Clean Water Act, local ordinances and other legal authorities intended to minimize impacts from storm water runoff on the biological integrity of natural drainage systems and water bodies;

b. Maximize, to the maximum extent practicable, the percentage of permeable surfaces to allow more percolation of storm water into the ground;

c. Minimize, to the maximum extent practicable, the amount of storm water directed to impermeable areas and to the MS4;

d. Minimize, to the maximum extent practicable, parking lot pollution through the use of appropriate BMPs such as retention, infiltration, and good housekeeping;

e. Establish reasonable limits on the clearing of vegetation from the project site including, but not limited to, regulation of the length of time during which soil may be exposed and, in certain sensitive cases, the prohibition of bare soil; and

f. Provide for appropriate permanent controls to reduce storm water pollutant load produced by the development site to the maximum extent practicable.

The Permittee may refer applicants to the *'California Storm Water Best Management Practice Handbooks,* California Storm Water Quality Task Force, Sacramento, CA (1992)' and its revisions; the Countywide Storm Water Management Plan; *'USEPA Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Issued under the Authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990,* Document No. EPA 840 B 92-002 (1993),'; and similar manuals for specific guidance on selecting post-construction BMPs for reducing pollutants in storm water discharges.

3. Planning Process

In order to integrate storm water management considerations into

discretionary development projects at the time that they are first proposed to jurisdictions, and to support other provisions of this Order:

a. The Principal Permittee, in consultation with the Permittees, shall develop storm water management guidelines for use in preparing/reviewing CEQA documents, and in linking storm water quality mitigation conditions to local discretionary project approvals not later than January 30, 1998.

The guidelines shall address the preservation of areas that provide water quality benefits such as riparian corridors and wetlands and shall promote protection of the biological integrity of drainage systems and water bodies.

Each Permittee shall review the guidelines for the purpose of making appropriate modifications in their internal procedures not later than six months after commencement of its next fiscal year following approval of the program by the Executive Officer, provided, however, that such approval is issued not later than 90 days prior to the commencement of the Permittee's fiscal year. If such approval is given within 90 days of the commencement of a Permittee's fiscal year, such program shall be implemented in the second fiscal year following approval but in no event shall implementation be later than July 30, 1999.

b. Each Permittee shall include watershed and storm water management considerations in the appropriate elements of the Permittee's General Plan, whenever said elements are significantly rewritten. Appropriate elements may include the following:

i. Conservation; and/or
ii. Open space; and/or
iii. Land-use; and/or
iv. Public utilities; and/or
v. Infrastructure; and/or
vi. Other appropriate elements.

4. Developer Information Program

The Principal Permittee, in consultation with the Permittees, shall develop a model program not later than January 30, 1998, to inform developers seeking discretionary approvals about:

a. Development and construction storm water management;

From: "Vicki Musgrove" <Vicki.Musgrove@mail.co.ventura.ca.us>
To: <XSWAMI@rb4.swrcb.ca.gov>
Date: 1/17/00 8:22AM
Subject: Re: Comment Letter on SUSMP

Xavier, I sent the letter twice - once attached and once in an email. I did receive one non deliverable message. I was trying to send it from the hotel - I was in SD attending the State Task Force meeting. The text is below. I will have a hard copy in the mail tommorrow. Hope this works. Let me know. Thanks Vicki

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Subject: Standard Urban Stormwater Mitigation Plan for Los Angeles County and Cities in Los Angeles County (SUSMP)

Dear Mr. Dickerson:

The Ventura County Flood Control District (NPDES Permit CAS063339) offers the following comments on the SUSMP proposed by the Regional Board for the stormwater programs in Los Angeles County. Our comments are provided given that approval of the numerical mitigation standard in the SUSMP has the potential to have a significant effect on the Ventura Countywide Stormwater Quality Management Program (Program) as well as other programs throughout the state.

Numerous treatment control Best Management Practices (BMPs) have been designed and built in Ventura County utilizing Program guidelines that deal with new development projects. The experience that we have gained has allowed us to take a practical look at design criteria. We feel strongly that when design standards are imposed, they should be written in a manner that is appropriate and technically sound. The proposed SUSMP, as presently written, will be extremely confusing to public agencies and engineers charged with designing facilities that comply with the specified criteria. The comments below are limited to technical issues that we feel need to be addressed and corrected prior to approval of the SUSMP document. Other details such as opportunities for regional facilities and credits for total design policies should also be dealt with in a comprehensive stormwater quality mitigation plan.

1. SUSMP Design Standards
On September 13, 1999 in a letter to Dr. Xavier Swamikannu, we requested that the approach for the design of both volumetric and flow-based treatment control BMPs that has been successfully utilized in the design of BMPs on new development projects, i.e., Unit basin storage volume design based on 70% capture of annual runoff and flow based design criteria based on 10% of the peak 50-year flow rate from impervious areas calculated using standard flood hydrology, be considered as an option in the SUSMP. We subsequently provided back up documentation to show the equivalence of our 70% capture of annual runoff to the 0.75ö rainfall capture criteria presented in the original SUSMP. The ôSUSMP Summary of Comments Received and Responseö (Response to Comments) misinterprets Ventura CountyÆs comment by indicating that we requested inclusion of peak flow rate control. In addition, the Response to Comments includes an action to add ôeighty five percent treatment of annual runoff volume as an equivalent mitigation criteriaö.
Inclusion of Peak Flow Rate Control as a Treatment BMP Design Criteria
It appears that the added condition B under Section 9 is an attempt to address Ventura CountyÆs request for the inclusion of a flow-based design criteria. This added language, as well as the language in the attached tentative resolution and the Response to Comments, indicates a confusion in the difference

between requirements for peak flow rate control versus a standard that allows the use of low flow-based water quality treatment control BMPs. The current language in the SUSMP sets design standards for treatment control BMPs based upon a combination of four volume-based design options AND the ôcontrol of peak flow dischargeö with no consideration of a design standard for BMPs that require a flow-based design. The language in the proposed SUSMP gives the designer an apparent flexibility in their choice of BMPs. This choice is important due to the wide ranges of land development types, pollutants, sensitive groundwater basin locations and BMP treatment control effectiveness. However, the present language limits the choices to those with volume-based design criteria, i.e. detention basins, infiltration basins. With the present language an engineer wanting to utilize any flow-based BMP, i.e., swales, filters, treatment devices, would need to make assumptions on technical items such as duration, frequency, and/or flow rate, leading to variable outcomes that could not assure compliance with the criteria as written.

When we asked questions on the above issue, your staff referred us to the State of MarylandÆs Stormwater Design Manual (Maryland Manual). This document is comprehensive and presents an approach for sizing stormwater facilities ôto meet pollutant removal goals, maintain groundwater recharge, reduce channel erosion, prevent overbank flooding and pass extreme floodsö. It is clear when they are dealing with the reduction of peak stormwater flow for flood control and when they are dealing with low flow pollutant removal sizing criteria. The design sizing criteria for water quality is volume-based when the options given require a volume-based design. Examples are included. Redevelopment is encouraged in order to reduce urban sprawl and although redevelopment projects are encouraged to implement BMPs, they are not required to meet the design standards and performance criteria established. This appears to allow flexibility for the use of other BMPs, including those requiring a flow-based design, on redevelopment projects. A careful review of documents like this one, that appear to be based on years of experience, may be helpful in development of appropriate criteria.

SUSMP Design Standard Options Are Not Technically Equivalent
While the most recent SUSMP does present Ventura CountyÆs volumetric methodology as an option, it sets the runoff volume standard for Los Angeles at 85% capture. We are pleased that the SUSMP now includes our methodology, but request review of the back up calculations and modification of the percent capture to reflect equivalent standards. The document, ôCalculations to Determine Equivalent Percent Volume Capture Criterionö, Swamikannu 12/12/99 appears to be inadvertently based on the rainfall curves for Bishop, CA. These curves are found one page before the page in the California Stormwater Best Management Practices Handbook (State Handbook) that contains the Los Angeles Airport curves. We request that the back up documentation be reviewed and the standards be set in an equivalent manner. Reducing the percent of runoff volume captured to a number is consistent with the proposed 0.75ö rainfall criteria will have minimal effect on pollutant removal.

2. The SUSMP Encourages Directly Connected Impervious Areas (DCIA)
A basic and effective site design principle for stormwater management is to minimize the amount of DCIA. In some cases, even directly connected ôcleanö run-off can decrease treatment efficiency as well as increase flood and erosion potential. However, the proposed SUSMP language encourages the direct connection of roof drains by allowing the exclusion of their area from the area for calculation of rainfall or runoff volume to be treated provided they connected directly to the storm drain system. This may not be appropriate in many cases and appears to be contrary to other parts of the document that encourage projects to mimic predeveloped site conditions. In the Maryland Manual, stormwater credits are allowed for innovative site planning practices, one of which is ôthe disconnection of rooftop runoffö.

The content of the SUSMP appears to have the potential to have far-reaching effects on many communities. We urge you to take the time to work with our county and others with experience in the design, construction and maintenance of treatment control BMPs as well as all other interested parties to discuss development of appropriate standards. We look forward to working with you on this issue.

If you have any questions please call me at (805) 654-5051.

Very truly yours,
Vicki Musgrove
Manager, Stormwater Quality Section

<<< "Xavier Swamikannu" <XSWAMI@rb4.swrcb.ca.gov> 1/14 11:15a >>>
Nothing was attached.!

PUBLIC WORKS AGENCY
county of ventura

Director
Arthur E. Goulet

Deputy Directors of Public Works
Wm. B. Britt
Transportation
John C. Crowley
Water Resources & Engineering
Kay Martin
Solid Waste Management
Jeff Pratt
Flood Control
Paul W. Ruffin
Central Services

January 14, 2000

Debbie J. Smith, Assistant Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Subject: **PROPOSED STANDARD STORM WATER MITIGATION PLAN**

Dear Ms. Smith:

This letter comments on the groundwater aspects of the subject plan that will be before your board on January 26, 2000.

Ventura County Water Resources fully supports your plan and suggests additional protection for unconfined basins where groundwater has a very high potential of being contaminated. The suggestions noted are presently being implemented in Ventura County through CEQA conditions. Specifically, the following additions are suggested:

Page 9 Item 2., page 10 Item C1, page 11 Item D1, D2, D3.
Add a requirement to protect unconfined groundwater basins. **"Projects located over unconfined groundwater basins shall incorporate an impervious liner beneath the concrete. The liner shall be constructed with 80 mil. HDPE, all seams shall be lapped and sealed and sides shall be turned upwards to prevent lateral movement of contaminants except towards a collection sump which shall be designed to collect contaminants for proper treatment and/or disposal."**

The reason we are interested in this extra protection for concrete areas is that our experience has shown that areas beneath concrete slabs of refueling and industrial areas are invariably highly contaminated due to permeability induced by edges, cracks or expansion joints. LARWQCB records of contamination beneath old refueling station slabs and industrial shop floors will confirm our experience.

Page 13, Item 12.
Add: **"Infiltration BMPs shall not be used to mitigate pollutants of concern when the project is located over an unconfined groundwater basin regardless of the separation to the water table."**

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As you know, Ventura County has both confined and unconfined basins representing millions of acre-feet of groundwater. The aquifers in these basins are recharged through unconfined areas such as the Oxnard Forebay Basin, the Fillmore Basin, the Piru Basin and parts of other basins.

Page 4. Definitions
Add definition of sanitary sewer. **(Any definition that plainly states that a sanitary sewer is not a septic tank).**

We believe that these requirements apply to Los Angeles County, and we are especially interested in incorporation of these comments into any plan that will apply to Ventura County.

Should you desire further information, please call me at 805 648-9204.

Very truly yours,

Lowell Preston, Ph.D.
Manager of Water Resources

cc: Xavier Swamikannu, Storm Water Program

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CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

R0069369.1

LOS ANGELES COUNTY URBAN RUNOFF AND STORMWATER NPDES PERMIT STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on, among other things, Section 402 (p) of the Clean Water Act, the Coastal Zone Act Reauthorizations Amendments of 1990 ("CZARA"), the California Water Code, and the 1987 amendments to the Clean Water Act that established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES permit. The primary objectives of the municipal storm water requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

This Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the program to address Development by the private sector. This SUSMP contains a listing of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. Developers will need to implement appropriate SUSMP requirements into their project plans. Each Permittee is then required to approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits.

Discretionary projects (as defined by CEQA), that fall into one of the seven categories of discretionary projects (as defined by CEQA) are identified in the NPDES Permit as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units

(Note: this category is two separate categories in the NPDES Permit)

DEFINITIONS

>9 unit home subdivision is any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

100,000 Square Foot Commercial Developments are be based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

A retail gasoline outlet is primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" is as defined by the local jurisdiction. For example, one jurisdiction defines "hillside" as a property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25% or greater, and where grading contemplates cut or fill slopes 30 feet high or greater.

An automotive repair shop is a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

Structural BMPs

BMPs

Treatment

Infiltration

Limitations ???????????? (evaluate this original language provided by the County)

100+ HOME SUBDIVISION
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 3

Should any conflict be discovered with these SUSMP requirements and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

CONFLICTS WITH LOCAL PRACTICES

Provisions of these SUSMP requirements may, at times, be in conflict with established local practices, e.g., specific language of signage used on storm drain stenciling. The Permittee may continue local practices and modify the SUSMPs contained herein to comport with those practices, except where those practices would obviate the intent of the mandated SUSMP.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate may result in a foreseeable increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

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- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

3. MINIMIZE STORMWATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants. Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2.

4. PROTECT SLOPES AND CHANNELS

If applicable, project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.

- Stabilize permanent channel crossings.

- Vegetate slopes with native or drought tolerant vegetation.

- With approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and game, install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.

Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following *structural BMP* requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, structural BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited tolegal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits

For all properties, this verification will include the developer'sstatement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Structural BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

100+ HOME SUBDIVISION
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 8

9. DESIGN STANDARDS FOR STRUCTURAL BMPS

Structural BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

Structural BMPs shall be designed to either:

a. mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event up to and including 0.75 inches of rainfall, prior to its being discharged into a storm water conveyance system, or

b. mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event based on the 85th percentile 24-hour runoff event determined as the maximized storm water volume for the area as discussed in Urban Runoff Quality management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, prior to its being discharged into a storm water conveyance system, or

c. mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event based on the historical record based reference 24-hour rainfall criterion (0.75 inch for the Los Angeles County area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event, prior to its being discharged into a storm water conveyance system.

In determining the area to be calculated in the above runoff mitigation criteria, the area included from roofing surfaces, may be excluded from the calculation provided:

a. the roofing materials do not contribute to pollutants of concern in stormwater runoff, and

b. runoff from the roof area is diverted directly to a storm water conveyance system.

Exclusions

This Section does not apply to the restaurant category if there is no parking lot associated with the development.

or if part of a larger development which will address this issue

R0069377

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

* Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.

- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.

- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. The project plans must include the following BMPs:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. Therefore, design plans which include fueling areas must include the following:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater run-on or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

* Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.

- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

11. VARIANCES

A Permittee may, through adoption of an ordinance or code incorporating these SUSMPs, provide for a variance process to ensure that SUSMP requirements that are not appropriate for a specific property development. However, the variance issued by the Permittee must be approved by the Regional Board's Executive Officer before it becomes effective.

12. Limitation on use of Infiltration BMPs

In some locations where groundwater resources may be adversely affected by the infiltration of pollutants carried by storm water runoff, infiltration BMPs are not required. These areas are identified (HOW?) ???? What do we do in place of infiltration.

TABLE 1: SUGGESTED RESOURCES

100+ HOME SUBDIVISION
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 13

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of

pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

R0069383

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)



September 15, 1999

VIA FACSIMILE (213/576-6640)

cc: xs
pls rtn

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Subject: SUSMP Numeric Limits

Dear Mr. Dickerson:

The Main San Gabriel Basin Watermaster is concerned that the proposed modifications to the Standard Urban Stormwater Mitigation Plan (SUSMP) may have adverse impacts on groundwater quality and water rights. The adoption of specific requirements without adequately studying the potential impacts could have consequences worse than the unintended groundwater contamination by methyl tertiary butyl ether (MTBE). In the case of the MTBE, groundwater has been contaminated in a quest to improve air quality. Watermaster's concern is that the Main San Gabriel Basin's groundwater could become contaminated in an attempt to marginally improve the quality of storm runoff.

Of primary concern is the requirement to contain and "treat" low-intensity rainfalls within certain individual properties. In order to comply with such a requirement, infiltration trenches or basins would likely be constructed. Such devices could, in effect, become vehicles for pollutants to be accidently or intentionally discharged into the ground. Furthermore, subsequent runoffs from heavier storms could "drive" the pollutants into the groundwater which is the primary drinking water supply source in San Gabriel Valley. Because Watermaster has not participated in or reviewed any of your studies related to the identification or fate of pollutants which would be captured, any modifications to the SUSMP should be postponed until the protection of the groundwater supply source is assured.

If you have any questions or desire additional information regarding these comments, please call me or Rick Sase at (626) 815-1300.

Sincerely,

MAIN SAN GABRIEL BASIN WATERMASTER

Carol Williams
Executive Officer

R0069385

725 North Azusa Avenue • Azusa, California 91702 • Telephone (626) 815-1300 • Fax (626) 815-1303
http://www.watermaster.org

San Gabriel Basin Water Quality Authority
858 Oak Park Road, Suite 200, Covina, California 91724 • (626) 859-7777 • Fax (626) 859-7788
http://www.wqa.com/sgvw/wqa

September 14, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality
Control Board – Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: Proposed Standard Urban Stormwater Mitigation Plan

Dear Mr. Dickerson:

The San Gabriel Basin Water Quality Authority (WQA) understands that the Regional Board will be discussing its proposed modifications to its Standard Urban Stormwater Mitigation Plan (SUSMP) at its September 16, 1999 meeting. Based upon our limited knowledge of the SUSMP modification at this time, we would like to offer comments that will hopefully help shape the program into a beneficial tool for the entire watershed.

It is our understanding that the proposed modifications to the SUSMP are primarily based on retaining and/or treating a significant portion of urban runoff during a storm event in an effort to minimize downgradient surface water pollution. This may require certain treatment-structural controls that include infiltration, filtration and detention devices.

While a general policy employing devices may have a positive effect on surface water, WQA recommends that actual implementation take into consideration the potential effect on groundwater quality and nearby groundwater supply wells. If contaminated surface runoff is allowed to recharge into sensitive and vulnerable recharge areas, a potential may exist for the groundwater supply to be negativity impacted. Therefore, the Regional Board should consider these possible impacts and use care when requiring infiltration devices in areas where the groundwater requires protection.

WQA applauds the Regional Board's efforts to improve the quality of the water resources within our watershed and looks forward to our continued cooperative efforts.

R0069386

MARGARET CLARK, Chairwoman • LARRY R. GLENN, Vice-Chairman • KENNETH R. MANNING, Treasurer • BOB G. KUHN, Board Member • JOHN LEUNG, Board Member

Thank you for providing us the opportunity to express our concerns regarding the proposed amendment to the SUSMP. Should you have any questions, please feel free to contact me at (626) 859-7777.

Sincerely,

Kirby Brill
Executive Director
San Gabriel Basin Water Quality Authority

cc: WQA Board Members

San Gabriel Valley Council of Governments

1971 East Colorado Blvd. Suite 101, Pasadena, California 91107-3970, Phone: (626) 564-9702 FAX: (626) 564-1116 E-Mail SGV@sgvcog.org

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EXECUTIVE DIRECTOR/
SECRETARY
Nicholas T. Conway
Arroyo Associates, Inc.

December 16, 1999

Mr. Jack J. Coe, Ph.D., Chairman
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th, Suite 200
Los Angeles, CA 90013

Subject: COG Resolution Opposing Numeric Standards on New Developments

Dear Dr. Coe:

The San Gabriel Valley Council of Governments (SGVCOG), a joint powers agency representing the 1.9 million Los Angeles County residents living in our 30 cities and unincorporated communities, is opposed to the proposed numeric standards for new development in our cities. To meet these numeric standards for storm water treatment/retention, developers will be required to install costly structural controls thereby increasing the costs of construction in the Valley. In addition, our cities will have to expand their already resource constrained enforcement programs.

As set forth in the attached resolution, we strongly oppose this expansion of your regulatory efforts and ask that you engage in a constructive dialog with our organization in seeking resolution to this issue.

Sincerely,

Nicholas T. Conway
Executive Director

Encl.: Resolution

R0069388

RESOLUTION NO. 99-07

A RESOLUTION OF THE SAN GABRIEL VALLEY COUNCIL OF GOVERNMENTS URGING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION TO DEFER DISCUSSION OF NUMERIC STANDARDS FOR TREATING OR RETAINING STORM WATER RUNOFF FROM NEW DEVELOPMENTS PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL NPDES PERMIT

Whereas, the San Gabriel Valley Council of Governments (hereinafter "San Gabriel Valley COG") is a joint powers agency representing more than 1.9 million Los Angeles County residents living in 30 cities and unincorporated communities;

Whereas, the California Regional Water Quality Control Board, Los Angeles Region (hereinafter "regional board"), is further considering the incorporation of numeric standards into the Standard Urban Storm Water Runoff Mitigation Plan (hereinafter SUSMP), a component of the model development planning program and a requirement of the Los Angeles County Municipal NPDES permit (hereinafter, "municipal NPDES permit");

Whereas, such numeric standards are intended to retain and/or treat storm water runoff volume (approximately 20,000 gallons per acre) from 3 categories of new development projects: 10-99 home sub-divisions, 100-plus home sub-divisions; and 100,000 square foot commercial developments;

Whereas, meeting the proposed numeric standards would necessitate the use of specific structural controls, including but not limited to extended detention basins, wet ponds, infiltration basins/ponds (which reduce the amount of developable space), storm drain-connected oil/grit separators, catch basin inserts, grassy swales, and other devices;

Whereas, the numeric standards are intended to treat/retain runoff from hard surfaces, including roof-tops, albeit there is no compelling data available indicating that pollutants from such surfaces are toxic or have an impairing affect on a beneficial use of a receiving water;

Whereas, such structural controls would require post-construction operation and maintenance, for which cities would be responsible;

Whereas, such controls, if not properly designed or maintained, could become sources of pollution rather than pollution mitigants;

Whereas, the numeric standards proposed by the regional board are not mandated in the municipal NPDES permit, nor are they required of other municipal NPDES permits in the State of California;

Whereas, neither the regional board nor any other interested party has demonstrated that storm water retention/treatment numeric standards would result in the improvement or protection of a beneficial use of a receiving water (ground water recharge, shellfish harvesting, wetland habitat protection, etc.);

Whereas, imposing such unproven and questionable numeric standards on cities constitutes an unfunded state mandate, one that has not been evaluated in cost-effective terms, as required by state law;

R0069389

Whereas, the Executive Advisory Committee hereinafter ("EAC") is a body representing cities from the Ballona Creek, Los Angeles River, San Gabriel River, Dominguez Channel, Malibu Creek, and Santa Clara Rivers;

Whereas, on August 11, 1999, the EAC elected to remove any reference to numeric standards from the SUSMP and recommended the adoption of non-numeric SUSMPs;

Whereas, if the numeric standard is adopted, developers and cities would have a difficult time implementing because of the:

1. lack of experience with the structural controls required to meet the numeric standard; and

2. absence of adequate guidelines (e.g., a guidance document containing information regarding the cost, pollutant effectiveness, and pollutant applicability of structural controls that would be needed to meet the numeric standard; and the constraints limiting their use such as soil conditions and siting considerations);

Whereas, during a regional board public hearing held on September 16, 1999, approximately 50 cities expressed opposition to the proposed numeric standards, resulting in the continuation of the matter to another public hearing scheduled for January 6, 2000.

NOW, THEREFORE, the San Gabriel Valley COG does hereby resolve as follows:

Section 1. Call upon the regional board to defer inclusion of numeric standards into SUSMPs until such time the following has been established:

i. an identification of the type of and quantity of pollutants generated from each of the subject new developments;

ii. the type and quantity of pollutants identified pose a threat to a beneficial use of those receiving waters into which San Gabriel Valley cities discharge;

iii. an evaluation of those structural controls required to meet numeric standards in terms of (a) appropriateness to each of the pollutants of concern and (b) pollutant removal capacity; and

iv. an "out clause" in the event a numeric standard cannot be met for reasons of economy or feasibility.

Section 2. Recommend that the regional board approve the SUSMP, as proposed by the Executive Advisory Committee on August 11, 1999, which does not include numeric standards.

Section 3. Advise the regional board that if it adopts the numeric standards without meeting the conditions specified under Section 1, the San Gabriel Valley COG shall prepare a petition for submittal to the State Water Resources Control Board appealing the regional board's action.

R0069390

PASSED, APPROVED, AND ADOPTED this 16 day of December 1999.

SAN GABRIEL VALLEY COUNCIL OF GOVERNMENTS

By _____
Harry Baldwin, President

Attest:

_____
Nicholas Conway, Secretary

RECEIVED

STATE OF CALIFORNIA—THE RESOURCES AGENCY GRAY DAVIS, Governor

SANTA MONICA MOUNTAINS CONSERVANCY
STREISAND CENTER FOR CONSERVANCY STUDIES
5750 RAMIREZ CANYON ROAD
MALIBU, CALIFORNIA 90265
PHONE (310) 589-3200
FAX (310) 589-3207

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CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

December 16, 1999

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION
1999 JAN 27 P 1:19
RECEIVED

Dennis Dickerson
Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Dear Mr. Dickerson:

The Santa Monica Mountains Conservancy (Conservancy) is the principal state agency charged with planning and conservation within the Santa Monica Mountains Zone pursuant to Division 23 of the Public Resources Code. The Conservancy has reviewed the *Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County* (SUSMP) proposed by the Los Angeles Regional Water Quality Control Board (LARWQCB) and has the following comments.

The LARWQCB is to be congratulated for taking this major step forward in protecting water quality within the Los Angeles region. We applaud the LARWQCB for their proactive approach to the issues of storm water runoff. In implementing this plan, LARWQCB should adopt the strongest water quality protection available.

The Conservancy is concerned about water quality issues since much Conservancy open space is adjacent to or bisected by streams that contain stormwater runoff. The Conservancy is also a stakeholder in the planning process for management plans for six of the watersheds under the LARWQCB's jurisdiction. The additional runoff resulting from new developments can be catastrophic, increasing water velocity, erosion, sediment load, and pollutants, and decreasing water quality. These changes can be disastrous for resources dependent on these streams.

The Conservancy has several specific technical comments relating to the details of the plan.

- The Conservancy is pleased that the LARWQCB has extended protection to environmentally sensitive areas by requiring SUSMPs for "locations adjacent to or discharging" into these areas. However, we would ask that the definition for "Environmentally Sensitive Area" be expanded to include open space areas owned or operated by federal, state, or local agencies. Open space land is under tremendous pressure for development. Any open space, and the resources it protects, is environmentally sensitive.

- The section, Conflicts with Local Practices, seems to nullify the SUSMP requirements. Your Response to Comments state several times that "Federal laws and regulations require that controls on new development and redevelopment be enforceable." The final sentence in the Conflicts with Local Practices section states, "The Permittee may continue the local practices and modify the SUSMPs contained herein to be consistent with the code, except where those practices would defeat or circumvent the intent of the SUSMP requirements." This language seems vague and not enforceable. Resource agencies normally require whatever standards are more protective or more stringent, and enforceable.

- The document makes a good argument for the proper maintenance of treatment control Best Management Practices (BMP) in Section 8, Provide Proof of Ongoing BMP Maintenance. We agree that the developer must accept responsibility for the maintenance until the time the property is transferred to public entities. However, a mandatory source of funds for ongoing monitoring and maintenance of treatment control BMPs transferred to public entities should be specifically stated. The loss of permeable surfaces and its associated water quality values to development is permanent. It is necessary to maintain the required treatment control BMPs in perpetuity in order to compensate for the permanent effects of development. It follows then that the developer or any successor must be responsible for the permanent maintenance of the structural BMP in a manner, which fully mitigates the development impacts to water resources (surface and groundwater). As such, permanent maintenance of the structural BMP should be required as a condition of the granting of any permits, which might be required for project construction. To assure the ongoing cost of management and maintenance of BMPs in perpetuity, a non-eroding endowment fund must be established so the public agency assuming maintenance responsibility can pay for all the necessary activities to maintain and monitor the structural BMP site. No taxpayer except the developer and any

successors should shoulder these costs. These maintenance costs are simply the price of doing business.

- Section 9 excluded the area of roofing as part of the calculation for total area rainfall or runoff volume. This exclusion requires explanation. Roofs are impervious surfaces that divert water into stormwater drains and reduce percolation to groundwater reservoirs. Due to the air quality in Los Angeles County, the pH of roof stormwater can be quite low, especially first flushes. In addition, the volume of water shed from roofs accounts for a high percentage of the impervious surface area associated with development. This calculation minus the roof area guarantees undersized treatment control BMPs and inadequate control of first flushes through treatment structures. Inadequately designed treatment structures leads to complaints about the program itself. These failures and resultant complaints could be avoided with adequately sized structures designed from the initial calculation that incorporates all impervious surfaces.

- Within Section 11, Waiver, the SUSMP provides authority for local jurisdictions to incorporate 'impracticability waivers' for specific properties. Three recognized situations are listed. These waivers provide large loopholes for any developer to use.
  - (i) *Extreme limitations of space for treatment on a redevelopment project.* The number of BMP offered in Table 2 as well as BMPs from the bibliographic references offered from California and other states suggests a wide range of routine ideas that can be incorporated into any redevelopment plan regardless of the space limitations.
  - (ii) *Unfavorable or unstable soil conditions at site to attempt filtration.* If the site has unfavorable or unstable soil conditions, the area probably should not be developed. In recent years, we have seen a number of development homes literally torn apart by unstable soil conditions (e.g. Laguna Beach and Calabasas). Unstable soil conditions should not even be considered. If the area cannot handle infiltration, it cannot handle development.
  - (iii) *Risk of groundwater contamination because underground source of drinking water is less than ten feet from the soil surface.* This condition sounds reasonable as the basis for a waiver except that again there is such a wide array of options available for BMPs, the argument is invalid. In addition, the LARWQCB in its Response to Comments states that "pretreatment of storm water will reduce such risks. The soil acts as a natural filter and self regenerates." Your own statements argue against this waiver condition.

The Waiver Section also states that any "other justification for impracticality must be approved by the LARWQCB Board's Executive Officer before it becomes recognized and effective." The stringency of these justifications should be discussed otherwise the arguments could be as flawed as those stated above.

We appreciate the opportunity to submit these comments for consideration. Please direct any questions and documents to Kathleen Bullard, Director of the Los Angeles River Center and Gardens, at (323) 221-8900 extension 101, or Ellen Mackey, Staff Ecologist, at (818) 504-2196.

Sincerely,

Elizabeth A. Cheadle

ELIZABETH A. CHEADLE
Chairperson

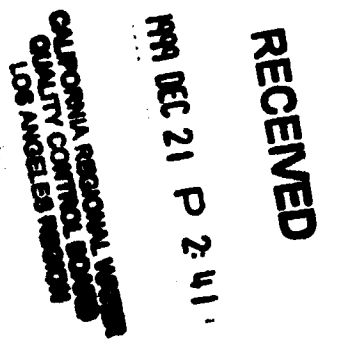
cc: Zev Yaroslavsky, Supervisor, County of Los Angeles
Hon. Brad Sherman, U S House of Representatives (Susan Little)
Jovita Pajarillo, U S EPA, Region 9
Dave Castanon, U S Army Corps of Engineers
Alex Helperin, Project Attorney, NRDC Los Angeles
Lisa Boyle, Heal the Bay
Steve Fleischli, Santa Monica BayKeeper
Melanie Winter, Friends of the Los Angeles River
Barbara Wampole, Friends of the Santa Clara River
Morgan Wehtje, California Department of Fish and Game

South Bay Cities
COUNCIL OF GOVERNMENTS

5033 Rockvalley Road
Rancho Palos Verdes, CA 90275

December 20, 1999

Mr. Dennis A. Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105



Dear Mr. Dickerson,

Attached please find a resolution urging the California Regional Water Quality Control Board, Los Angeles Region, to defer discussion of numeric standards for treating or retaining storm water runoff from new developments pursuant to the Los Angeles County Municipal NPDES Permit. This resolution was adopted by the South Bay Cities Council of Governments Steering Committee at their meeting of December 7, 1999.

Thank you for your consideration of our position.

Sincerely,

Bob Pinzler

Bob Pinzler, Chair, SBCCOG
Councilman, Redondo Beach

R0069396

RESOLUTION NO. 99-3

A RESOLUTION OF THE SOUTH BAY COUNCIL OF GOVERNMENTS URGING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, TO DEFER DISCUSSION OF NUMERIC STANDARDS FOR TREATING OR RETAINING STORM WATER RUNOFF FROM NEW DEVELOPMENTS PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL NPDES PERMIT

WHEREAS, the South Bay Council of Governments (hereinafter "South Bay COG"), is a sub-region of the Southern California Association of Governments, consisting of 16 member cities;

WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region (hereinafter "regional board"), is further considering the incorporation of numeric standards into the Standard Urban Storm Water Runoff Mitigation Plan (hereinafter SUSMP), a component of the model development planning program and a requirement of the Los Angeles County Municipal NPDES permit (hereinafter, "municipal NPDES permit");

WHEREAS, such numeric standards are intended to retain and/or treat storm water runoff volume (approximately 20,000 gallons per acre) from 3 categories of new development projects: 10-99 home sub-divisions, 100-plus home sub-divisions; and 100,000 square foot commercial developments;

WHEREAS, meeting the proposed numeric standards would necessitate the use of specific structural controls, including but not limited to extended detention basins, wet ponds, infiltration basins/ponds (which reduce the amount of developable space), storm drain connected oil/grit separators, catch basin inserts, grassy swales, and other devices;

WHEREAS, the numeric standards are intended to treat/retain runoff from hard surfaces, including roof-tops, albeit there is no compelling data available indicating that pollutants from such surfaces are toxic or have an impairing effect on a beneficial use of a receiving water;

WHEREAS, such structural controls would require post-construction operation and maintenance, for which cities would be responsible;

WHEREAS, such controls, if not properly designed or maintained, could become sources of pollution rather than pollution mitigants;

WHEREAS, the numeric standards proposed by the regional board are not mandated in the municipal NPDES permit and are not required of other municipal NPDES permits in the State of California;

WHEREAS, neither the regional board nor any other interested party has demonstrated that storm water retention/treatment numeric standards would result in the improvement of protection of a beneficial use of a receiving water (ground water recharge, shellfish harvesting, wetland habitat protection, etc.):

WHEREAS, imposing such unproven and questionable numeric standards on cities constitutes an unfounded state mandate, one that has not been evaluated in cost-effective terms, as required by state law;

WHEREAS, the Executive Advisory Committee hereinafter ("EAC") is a body representing cities from the Ballona Creek, Los Angeles River, San Gabriel River, Dominguez Channel, Malibu Creek, and Santa Clara Rivers;

WHEREAS, on August 11, 1999, the EAC elected to remove any reference to numeric standards from the SUSMP and recommended the adoption of non-numeric SUSMPs;

WHEREAS, if the numeric standard is adopted, developers and cities would have a difficult time implementing because of the:

1. lack of experience with the structural controls required to meet the numeric standard; and

2. absence of adequate guidelines (e.g., a guidance document containing information regarding the cost, pollutant effectiveness, and pollutant applicability of structural controls that would be needed to meet the numeric standard; and the constraints limiting their use such as soil conditions and siting considerations);

WHEREAS, during a regional board public hearing held on September 16, 1999, approximately 50 cities expressed opposition to the proposed numeric standards, resulting in the continuation of the matter to another public hearing scheduled for January 6, 2000.

NOW, THEREFORE, the South Bay Cities COG does hereby resolve as follows:

Section 1.

Call upon the regional board to defer inclusion of numeric standards into SUSMPs until such time the following has been established:

i. an identification of the type and quantity of pollutants generated from each of the subject new developments;

ii. the type and quantity of pollutants identified pose a threat to a beneficial use of those receiving waters into which South Bay cities discharge;

iii. an evaluation of those structural controls required to meet numeric standards in terms of (a) appropriateness to each of the pollutants of concern and (b) pollutant removal capacity; and

iv. an "out clause" in the event a numeric standard cannot be met for reasons of economy or feasibility.

Section 2.

Recommend that the regional board approve the SUSMP, as proposed by the Executive Advisory Committee on August 11, 1999, which does not include numeric standards.

Section 3.

Advise the regional board that if it adopts the numeric standards without meeting the conditions specified under Section 1, the South Bay Cities COG shall prepare a petition to the State Water Resources Control Board appealing the regional board's action.

SOUTHERN CALIFORNIA

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Riverside County Transportation Commission: Robin Lowe, Hemet

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January 21, 2000

Mr. Dennis Dickerson, Executive Officer
Los Angeles Regional Water Quality Control Board
320 W. Fourth Street, Suite 200
Los Angeles, CA 90013-1105

SUBJECT: Standard Urban Stormwater Mitigation Plan (SUSMP)

Dear Mr. Dickerson:

Attached is the SUSMP policy statement adopted by our Regional Council on January 6, 2000. This statement reflects a policy process by which our Water Policy Task Force and our Energy and Environment Committee considered extensive testimony on this issue last year. You are already aware of the resolutions adopted by three of the subregional councils of governments in Los Angeles County.

During the Regional Council's deliberation comments were made that gave emphasis to varying environmental, economic and developmental concerns. All of these comments underscored the need for improved water quality in our region. Your Board should know that the Council voted unanimously to support this policy for environmental protection.

This action recommends that the Board pursue an alternative to the proposal developed by your staff. We believe that a much greater pollutant reduction can be achieved with a TMDL-driven numeric process than with a volume-driven numeric process. It should be significant to the Board that the approach we are recommending will accelerate a TMDL process that now is suffering from limited resources and staffing, not to mention needed participation. Where a volume-driven numeric approach is described as requiring between 50-100 years to bring desired water quality, a TMDL-driven numeric approach is likely to bring success much more quickly. This owes to its focus on, among other things, pollutants of concern, watershed-scale mitigation strategies and a larger public/private community through which raising financial and organizational resources can succeed.

With scarce resources at our disposal we must work for water quality in ways that best utilize these resources. For this reason, SCAG stands ready to work with you and the Board to develop the implementation schedules and program budgets needed for storm water pollution reduction in each of the County's six watersheds. Efforts underway such as those in the Malibu Creek Watershed offer an example of what needs to be started in other places of the Basin. We await word of the Board's interest in this accelerated approach to pollution reduction.

In the interests of sharing this vision with your Board, please assist us by earmarking 10 minutes for us to give our comments at the January 26th meeting.

Sincerely,

Mark Pisano

Mark Pisano,
Executive Director

Post-it™ Fax Note 7671	Date	# of pages ▶ 3
To Jorge Leon	From Dennis	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

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MEETING

of the

WATER POLICY TASK FORCE

January 18, 2000
10:00 A.M.

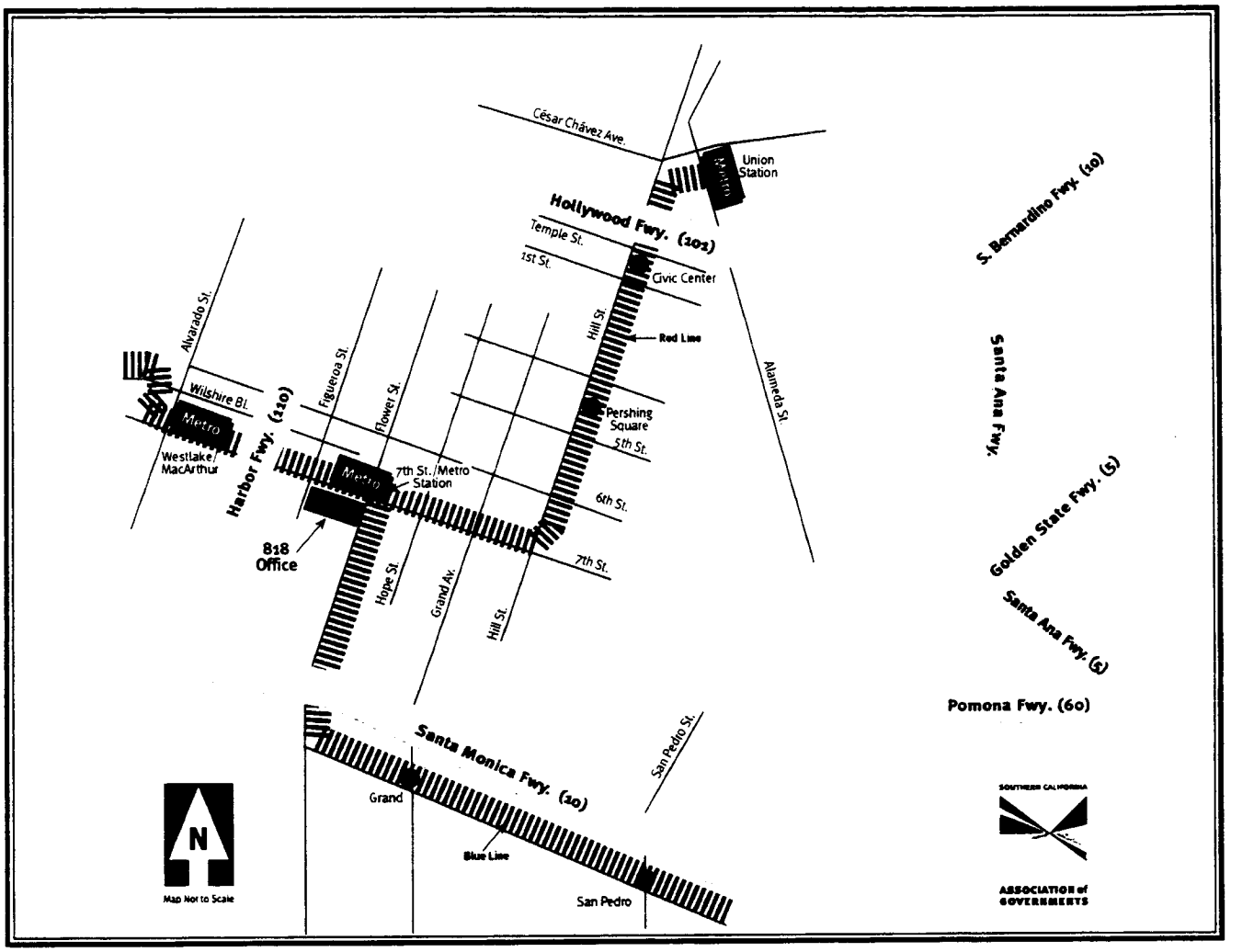
Held at the

SCAG OFFICES
Conference Room - Riverside B
818 West 7th Street, 12th Floor
LOS ANGELES, CA 90017
(213) 236-1800

MAP & AGENDA ENCLOSED

If Task Force members and/or members of the public wish to review the attachments located in the office of the Secretary, or have any questions on any of agenda items, please contact Dan Griset at (213) 236-1895.

How to get to the Southern California Association of Governments



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SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

Rev. 9/99

R0069402

AGENDA
WATER POLICY TASK FORCE
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

January 18, 2000
10:00 a.m.
SCAG Offices: Riverside B Meeting Room

Page #

1.0 CALL TO ORDER

2.0 PUBLIC COMMENT PERIOD

Members of the public desiring to speak on an agenda item must notify the Secretary prior to the public comment period. Comments will be limited to three minutes.

3.0 APPROVAL OF MINUTES

Approve the minutes of the November 16, 1999 meeting. (Minutes will be distributed at the time of this meeting.)

4.0 PRESENTATION ITEMS FOR THE TASK FORCE

4.1 An Update on the Strategic Planning Process of the Metropolitan Water District of Southern California 3

Mr. Adan Ortega, Jr., Executive Assistant to the General Manager and Acting Outreach Group Manager , will give the Task Force a briefing on the progress being made by the Board of MWD in its strategic planning process. This effort has been a multi-year program to review and redefine the District's mission and recommend related organizational adjustments. During this process the District has also had significant senior management changes.

4.2 Standard Urban Storm Water Mitigation Plan (SUSMP) Update 9

The Regional Council approved a statement of policy on the Los Angeles County SUSMP proposal. The staff for the Regional Water Quality Control Board will be releasing its recommendations for the January 26th meeting of the Board on January 14, 2000. Other interested parties are meeting and developing positions on this issue during January.

Staff for the Task Force has invited several speakers to brief the Task Force on late developments or positions on the proposed policy with a view to having the Task Force direct staff on the preparation of appropriate testimony at the January 26th hearing by the Regional Board.

Standard Urban Storm Water Mitigation Plan (SUSMP) Update (cont.)

Standard Urban Storm Water Mitigation Plan (SUSMP) Update (cont.)

Invited Speakers:

Dr. Xavier Swamikannu, Manager of Stormwater Programs at the Los Angeles Regional Water Quality Control Board, will brief the Task Force on the policy recommendations being made by staff for the Regional Board's consideration on January 26, 2000.

Barb Garrett, Legislative Analyst for the City Council of Los Angeles, will brief the Task Force on the SUSMP policy assessments done by the Legislative Analyst's Office that are under consideration by the Los Angeles City Council.

Terri Grant, Supervising Engineer in Los Angeles County's Environmental Programs Division, will brief the Task Force on the County's view of the proposed SUSMP policy.

Desi Alvarez, Chair of the Executive Advisory Committee (EAC) and Director of Public Works for the City of Downey, will brief the Task Force on the positions taken by the EAC with the County and with the Regional Board.

5.0 CHAIR'S REPORT

6.0 STAFF REPORT

7.0 TASK FORCE INFORMATION SHARING

8.0 COMMENT PERIOD

Any Task Force member, staff and members of the public desiring to comment on items not covered on the Agenda, within the Task Force's jurisdiction may do so at this time. Comments should be limited to three minutes.

9.0 ADJOURNMENT

MEMORANDUM TO THE WATER POLICY TASK FORCE

January 10, 2000

TO: *Members of the Water Policy Task Force*

FROM: *Daniel E. Griset, Sr. Planner, X895, griset@scag.ca.gov*

SUBJECT: *An Update on the Strategic Planning Process of the Metropolitan Water District of Southern California*

RECOMMENDATION:

Receive comments for policy consideration.

BACKGROUND:

In 1998 the Board of the Metropolitan Water District convened an extensive strategic planning process. This process has meant a thorough review of the District's mission and the needs of its member agencies and their water retailers. This process is scheduled for completion within the next several months.

SCAG leaders have had some consultation with MWD's management in which ideas about collaboration and cooperation have been discussed. A key idea discussed was the potential for SCAG's development of a Southern California Water Demand Forecast Program. This kind of effort would require a joint development with SANDAG in order to provide MWD with reliable third-party research and reporting from the entire MWD service area. This third-party resource would offer MWD and other water agencies in southern California with independent data needed for making important water supply planning decisions involving capital investment plans, system adequacy assessments and regional service expectations. This kind of initiative would remove the potential complications or conflicts caused by an agency developing both water demand projections and water supply programs within the same organization.

#31715

SUSMP Policy Approved by the Regional Council of the

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

(January 6, 2000)

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

The Regional Council calls for the participation of the various sub-regional councils, POTWs and other necessary entities in the development of watershed initiatives needed for reducing and managing storm water runoff pollution in the region.

11-153-A-10

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

December 14, 1999

Mr. Dennis Dickerson, Executive Director
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Re: Proposed Standard Urban Storm Water Mitigation Plan

Dear Dennis:

I am writing to express a great deal of concern among our member cities with the announced schedule for consideration of your newly proposed SUSMP on January 6, 2000. January 6 is the regularly scheduled meeting day when all of our Policy Committees and our Governing Board convene throughout that day. This means that many of our officials cannot participate in your meeting.

Because of the significance of the proposed SUSMP policy we request that you reschedule this matter for the Board's consideration and decision for a later meeting in January or February.

Many of our locally-elected officials are very interested in addressing the Board and offering suggestions at a later meeting. We also believe that the Board would be better served by providing ample time to interested members of the public in which they may consider your proposal and its new directions without the distractions or travel of the holidays.

Thank you for your interest and consideration.

Sincerely,

Mark Pisano
Executive Director

R0069407

Strategic Plan Policy Principles

December 14, 1999

Preamble

Metropolitan is a voluntary cooperative of member public agencies created for the purpose of "developing, storing and distributing water." Metropolitan's Board is committed to providing a high quality, reliable supply of affordable water for the residents in its service area.

The strategic planning process was initiated in July 1998 in an effort to address the evolving needs of the member agencies and their retailers to effectively fulfill Metropolitan's mission over the long-term. These diverse needs focus on flexibility, certainty and public stewardship.

> **Flexibility:** There are significant legislative and economic pressures to increase the flexibility and responsiveness of water services to meet changing demands through a competitive water market. Fair compensation for wheeling through Metropolitan's conveyance systems is an essential element of Southern California's developing market.
>
> **Certainty:** Certainty in Metropolitan's supply reliability and cost of service is important to member agencies and retailers, particularly in their efforts to ensure value to their customers.
>
> **Public Stewardship:** Metropolitan and its member agencies must ensure that water is available to meet the needs of the public in a cost-effective and environmentally sound manner.

The Board has been engaged in a strategic planning process for the past year and a half. This process identified areas of common interests that form the basic elements for Metropolitan's strategic plan. Issues related to cost allocation and rate structure require further discussion and resolution.

Statement of Common Interests

- Regional Provider. Metropolitan is a regional provider of water for its service area. In this capacity, Metropolitan is the steward of regional infrastructure and the regional planner responsible for drought management and the coordination of supply and facility investments. Regional water services should be provided to meet the needs of the member agencies. Accordingly, the equitable allocation of water supplies during droughts will be based on water needs and adhere to the principles established by the Water Surplus and Drought Management Plan.

- Financial Integrity. The Metropolitan Water District Board will take all necessary steps to assure the financial integrity of the agency in all aspects of its operations.

- Local Resources Development. Metropolitan supports local resources development in partnership with its member agencies and by providing its member agencies with financial incentives for conservation and local projects.

- Imported Water Service. Metropolitan is responsible for providing the region with imported water, meeting the committed demands of its member agencies.

- Choice and Competition. Beyond the committed demands, the member agencies may choose the most cost-effective additional supplies from either Metropolitan, local resources development and/or market transfers. These additional supplies can be developed through a collaborative process between Metropolitan and the member agencies, effectively balancing local, imported, and market opportunities with affordability.

- Responsibility for Water Quality. Metropolitan is responsible for advocating source water quality and implementing in-basin water quality for imported supplies provided by Metropolitan to assure full compliance with existing and future primary drinking water standards and to meet the water quality requirements for water recycling and groundwater replenishment.

- Cost Allocation and Rate Structure. The fair allocation of costs and financial commitments for Metropolitan's current and future investments in supplies and infrastructure may not be reflected in status quo conditions and will be addressed in a revised rate structure:

    a) The committed demand, met by Metropolitan's imported supply and local resources program, has yet to be determined.

    b) The framework for a revised rate structure will be established to address allocation of costs, financial commitment, unbundling of services, and fair compensation for services including wheeling, peaking, growth, and others.

Next Steps in the Strategic Planning Process

Outstanding Issues To Be Resolved

While the November workshop identified the common interests of the Metropolitan Board of Directors on the strategic plan, outstanding issues that require further discussion and resolution were also highlighted. These outstanding issues included the following:

- The baseline regional demand, which guides Metropolitan's delivery requirements, should be determined. Metropolitan is responsible for providing the region with imported water, meeting this projected baseline demand of its member agencies. Beyond this projected baseline demand, the member agencies may choose the most cost-effective additional supplies from either Metropolitan, local resources development, and/or market transfers.

- The process for selecting the most cost-effective local resources development projects for joint implementation by Metropolitan and its member agencies should be developed.

- A framework should be established to guide the design and implementation of a revised rate structure. The framework should address the following issues.

    - Fair allocation of costs and financial commitments for Metropolitan's current and future investments in imported water supplies, source water quality improvements, in-basin treatment, and infrastructure in consideration of regional water needs, past financial contributions, and other relevant factors;
    - The manner, in which Metropolitan pays for Local Resources Program projects and conservation;
    - Fixed revenues, including growth charges, property taxes, and standby charges;
    - Peaking charges;
    - Commodity rates;
    - Unbundling of services;
    - Fair compensation for replenishment and agricultural water deliveries;
    - Fair compensation for wheeling.

Schedule

In the next three months, the Board will have the opportunities to establish the Strategic Plan policy principles and successfully complete the development phase of the process. The meetings, deliverables and Board items are as follows:

Meeting	Deliverables	Board Items
December 14 Strategic Plan Workshop	Strategic Plan Steering Committee recommendation on policy principles and next steps. Member agency managers' presentation on rate structure framework.	Discussion of recommended policy principles.
December 14 Board Meeting	Strategic Plan Steering transmittal of recommended policy principles and next steps.	Board consideration and action recommended policy principles.
Early January Strategic Plan Steering Committee	Draft of the rate structure framework and guidelines. Preliminary determination of projected baseline demands and selection process for local resources projects.	Committee discussion on draft rate structure framework and guidelines.
January - February Board Meetings	Strategic Plan Steering Committee recommendation on rate structure framework and guidelines, and other outstanding issues.	Board consideration and action on recommended rate structure framework and guidelines.
February – March	Public meetings on proposed policies and guidelines.	Board receives and considers the input from public meetings.
March – April	Strategic Plan Steering Committee recommendation on implementation steps.	Board direction to staff to implement Strategic Plan according to approved principles and guidelines.

As Metropolitan proceeds with development of the Strategic Plan, the relationship between policy and implementation becomes important. The Board is responsible for establishing policy positions and guidelines regarding the responsibilities of Metropolitan as a public agency. The proposed policy principles provide such guidelines. Staff is then responsible for implementing these policies by developing specific programs and procedures, including rate structure development, project selection, and investment strategies for supplies and infrastructure improvements.

Adán Ortega, Jr.
Executive Assistant to the General Manager and
Acting Outreach Group Manager

An experienced strategic planner, Ortega is assisting in the development of the district's strategic plan for the new millennium, now being crafted. He has been involved in statewide strategic planning efforts for trade and commerce, voter outreach and water bond negotiations.

Ortega, Secretary of State Bill Jones' assistant from 1997 to May 1999, previously spent five years at the jointly managed West Basin and Central Basin municipal water districts in senior management positions, including assistant general manager. Prior to joining the water districts in 1984, Ortega held various positions with the Dolphin Group, Inc., a Los Angeles- and Sacramento-based public affairs agency where he rose to the position of vice president during his nine-year tenure.

Born in El Paso, Texas, Ortega received his bachelor's degree from Whittier College. He was a two-year fellow of the California Agricultural Leadership Program and studies sociological, economic and political issues tied to food distribution through travel in South American and interaction with leaders and field experts.

Ortega, a resident of Whittier, serves on the boards of the National Hispanic Media Coalition and Heal the Bay. He also is a volunteer speaker for the Los Angeles Youth at Work Program.

He and his wife, Dr. Susan E. Allen, have one child.

MEMORANDUM TO THE WATER POLICY TASK FORCE

January 10, 2000

TO: *Members of the Water Policy Task Force*

FROM: *Daniel E. Griset, Sr. Planner, X895, griset@scag.ca.gov*

SUBJECT: *Standard Urban Storm Water Mitigation Plan (SUSMP) Update*

RECOMMENDATION:

Receive testimony and direct staff to prepare testimony for the Regional Board hearing on January 26, 2000 that is consistent with the Regional Board policy adopted on January 6, 2000 and to authorize the Chair of the Task Force to arrange for speakers who will give this SCAG testimony.

BACKGROUND:

On January 6, 2000 the Regional Council adopted the attached policy statement on storm water runoff pollution. This policy gives general direction to the Task Force as it considers the most current versions of the various key parties involved with this issue prior to the January 26th hearing of the Los Angeles Regional Water Quality Control Board. Also attached is the staff report for the Regional Council that gives additional background on the SUSMP issue, as well as the December formulation of the staff recommendation.

There are many discussions underway between the Regional Board staff and interested parties throughout the region. The Board's staff has changed its recommendations at each interval in the process and so it is important that the Task Force be briefed on the Board's staff report once it is released on January 14th. A copy of that document will be available at the Task Force meeting.

Since positions may be "fluid" in the several weeks before January 26th, staff seeks direction and comments from the Task Force prior to staff's preparation of SCAG testimony for the Board hearing. Staff also recommends that the Task Force authorize the Chair to arrange for speakers to give this testimony at the hearing.

#31715

Action taken by the Regional Council (1/6/00)

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

The Regional Council urges staff to facilitate the participation of the various sub-regional councils, POTWs and other necessary entities in the development of watershed initiatives needed for reducing and managing storm water runoff pollution in the region.

MEMO

(Note: This is edited for the use of the Task Force at its meeting of January 18, 2000)

To: **Regional Council**

From: **Daniel E. Griset, Sr. Planner (213.236.1985), email: griset@scag.ca.gov**

Date: **December 15, 1999**

RE: **Proposed Standard Urban Storm Water Mitigation Plan**

SUMMARY:

At its January 26, 2000 meeting the Regional Board will consider new provisions for a storm water runoff mitigation plan with a numeric standard requiring retention and treatment of up to ¾ of an inch of runoff on a specific site. The proposed plan would be inserted into both the new Long Beach storm water permit as well as the existing Los Angeles County permit. The plan would materially impact many new development and redevelopment sites in Los Angeles County. The EEC is scheduled to consider this same item at its meeting also on January 6.

BACKGROUND:

The current Los Angeles County Storm Water Permit that was issued in 1996 (as well as the City of Long Beach Storm Water Permit issued earlier this year) called for various programs to be developed by the permittees. Among these programs was one for addressing storm water pollution issues that may result from development planning for private projects. In August the Executive Officer of the Los Angeles Regional Board announced a new proposed rule for managing pollution carried by urban storm water runoff from certain new development sites. This rule required that these sites would need to retain and possibly treat up to the first ¾ of an inch of storm water collected on these sites from a 24 hour storm event. At a public hearing on September 16, 1999 local government and private industry responses to this proposal raised many questions and objections to the implementation of a "numeric standard" as an appropriate way to manage pollutants associated with urban storm water runoff. These responses suggested that a numeric standard was a "volume" strategy, not a water quality strategy. A numeric standard dealt with quantities of water rather than with specific pollution problems associated with a given location and general hydrology.

Following the September hearing the Water Policy Task Force scheduled two months of testimony on this issue. A wide cross section of interested parties appeared before the Task Force to give comments and suggestions on the proposed new policy. These parties included local governments in the region who have different approaches for managing this pollution, Caltrans, the storm water specialist from the Regional Board, the building industry association, the Natural Resources Defense Council, automobile recycling and gasoline station representatives, and a fast food restaurant representative.

In response to this testimony the Task Force instructed staff to pursue informal discussions among the various parties to search for new ideas for improving runoff water quality and preventing more runoff pollution. These discussions were convened and were helpful in highlighting the importance of looking at this runoff pollution problem as a regional or watershed problem (rather than just a problem for specific development sites) and as a problem requiring much better identification (rather than just retaining urban runoff everywhere).

These concerns were presented by Mark Pisano to Dennis Dickerson, Executive Officer of the Regional Board, at a meeting in mid-November. Following that meeting a SCAG memorandum was sent to the Executive Officer, urging him to implement a watershed management approach with Best Management Practices development and monitoring in various locations. From these efforts and with SCAG's assistance the use of a numeric standard could be used as a "backup" policy, not a "front-end" policy, when identified priority pollution problems are not mitigated. This approach would allow solutions to be tailored to actual, identified pollution occurring in specific reaches of waterbodies throughout the County. Similarly, this approach would feature larger-scale solutions (not just site-by-site runoff volume retention) that more successfully and economically stem runoff pollution and increase the beneficial uses of our region's waters.

Following this consultation with SCAG and many others interested in this issue, Mr. Dickerson issued the attached revised policy proposal on December 7, 1999. This proposal not only maintained the original numeric standard it introduced other new mitigation requirements and provisions. Initially this proposal was scheduled to be considered by the Board on January 6, 2000. In response to widespread concern about the holidays and the conflict with schedules such as our Regional Council on that day, the hearing on this new proposal has now been shifted to January 26.

The Executive Officer's transmittal memo recommends a sequence of actions: first, the Board would vote to implement the new policy as a part of the Long Beach permit and, second, the Executive Officer would then implement the new policy as a part of the Los Angeles County permit.

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STATE WATER RESOURCES CONTROL BOARD
QUALITY CONTROL BOARD
LOS ANGELES REGION

Xavier –

Here's a copy of the agenda.

R0069417

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San Bernardino County: Kathy Davis, San Bernardino County • Bill Alexander, Rancho Cucamonga • Jim Bagley, Twentynine Palms • David ..., Fontana • Lee Ann Garcia, Grand Terrace ... Norton-Perry, Chino Hills • Ray Rucker, ...ad

Ventura County: Judy Mikels, Ventura County • Donna De Paola, San Buenaventura • Andrew Fox, Thousand Oaks • Toni Young, Port Hueneme

Riverside County Transportation Commission: Robin Lowe, Hemet

Ventura County Transportation Commission: Bill Davis, Simi Valley

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MEETING

of the

WATER POLICY TASK FORCE

October 19, 1999
10:00 A.M.

Held at the

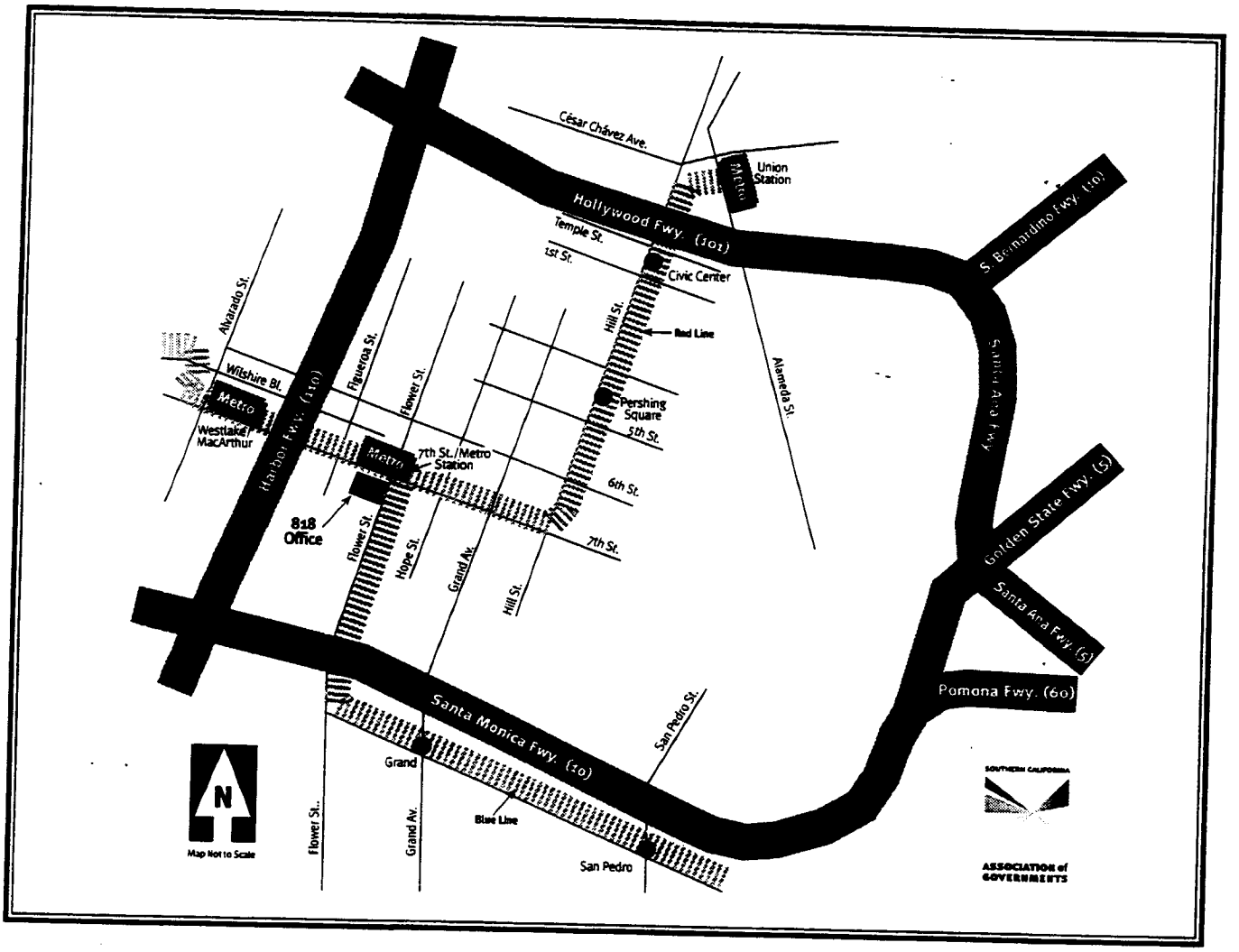
SCAG OFFICES
San Bernardino "A & B" Meeting Room
818 West 7th Street, 12th Floor
Conference Room - Riverside A
LOS ANGELES, CA 90017
(213) 236-1800

MAP & AGENDA ENCLOSED

If Task Force members and/or members of the public wish to review the attachments located in the office of the Secretary, or have any questions on any of agenda items, please contact Dan Griset at (213) 236-1895.

R0069418

How to get to the Southern California Association of Governments



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SOUTHERN CALIFORNIA ASSOCIATION of GOVERNMENTS

R0069419

Rev. 2/24/98

AGENDA
WATER POLICY TASK FORCE
SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

October 19, 1999
10:00 a.m.
SCAG Offices: San Bernardino A&B Meeting Room

Page #

1.0 CALL TO ORDER

2.0 PUBLIC COMMENT PERIOD

Members of the public desiring to speak on an agenda item must notify the Secretary prior to the public comment period. Comments will be limited to three minutes.

3.0 APPROVAL OF MINUTES 3
Approve the minutes of the September 21, 1999 meeting

4.0 PRESENTATION ITEMS FOR THE TASK FORCE

4.1 Standard Urban Storm Water Mitigation Plans (SUSMPs) 4

Dr. Xavier Swamikannu, Manager of Stormwater Programs at the Los Angeles Regional Water Quality Control Board, will review the history of the Regional Board's efforts to manage stormwater in the Los Angeles Basin. These efforts to control water pollution from non-point water sources have resulted in the proposed Standard Urban Storm Water Mitigation Plans (SUSMPs). These Plans have been supported by environmental groups in the Basin but have sparked strong opposition from certain affected cities and businesses. Dr. Swamikannu will discuss the economic and environmental aspects of the SUSMPs, as well as suggest opportunities for regional solutions to the Basin's serious stormwater pollution problems.

4.2 The Proposed SUSMPs as Viewed by the Los Angeles Environmental Community 11

Mr. David Beckman, Senior Attorney with the National Resources Defense Council, will give an Environmental Organization's assessment of the proposed SUSMPs.

4.3 The Proposed SUSMPs as Viewed by the Building Industry Association 20

Mr. Richard A. Watson, MA, AICP, Principal of a southern California urban and regional planning firm, has been one of the principal private sector contributors in the development of workable general permits for stormwater discharges associated with construction activity. Mr. Watson will give a building industry assessment of the proposed SUSMPs and offer suggestions for better managing stormwater and controlling this source water pollution.

4.4 The Proposed SUSMPs as Viewed by the City of Downey 24

Mr. Desi Alvarez, Director of Public Works at the City of Downey, will give his city's view of the proposed SUSMPs, as well as alternative ideas for controlling stormwater pollution.

4.5 The Proposed SUSMPs as Viewed by the City of Calabasas 25

Ms. Heather Lea Merenda, Stormwater Program Manager at the City of Calabasas, will give her city's view of the proposed SUSMPs, as well as describe programs currently operating as a result of the City's existing development policies.

4.6 Water Legislation Update

Staff will brief the Task Force on the status of selected bills passed by the state legislature and put before the Governor for signature.

5.0 CHAIR'S REPORT

6.0 STAFF REPORT

7.0 TASK FORCE INFORMATION SHARING

8.0 COMMENT PERIOD

Any Task Force member, staff and members of the public desiring to comment on items not covered on the Agenda, within the Task Force's jurisdiction may do so at this time. Comments should be limited to three minutes.

9.0 ADJOURNMENT

Minutes
WATER POLICY TASK FORCE MEETING
September 21, 1999

The Minutes will be sent to Task Force Members by separate cover

MEMORANDUM TO THE WATER POLICY TASK FORCE

October 6, 1999

TO: *Members of the Water Policy Task Force*

FROM: *Daniel E. Griset, Sr. Planner, X895, griset@scag.ca.gov*

SUBJECT: *Standard Urban Stormwater Mitigation Plans (SUSMPs)*

RECOMMENDATION:

Receive comments for policy consideration.

BACKGROUND:

Dr. Xavier Swamikannu, Manager of Stormwater Programs at the Los Angeles Regional Water Quality Control Board, will review the history of the Regional Board's efforts to manage stormwater in the Los Angeles Basin. These efforts to control water pollution from non-point water sources have resulted in the proposed Standard Urban Storm Water Mitigation Plans (SUSMPs). These Plans have been supported by environmental groups in the Basin but have sparked strong opposition from certain affected cities and businesses. Dr. Swamikannu will discuss the economic and environmental aspects of the SUSMPs, as well as suggest opportunities for regional solutions to the Basin's serious stormwater pollution problems.

The Executive Officer of the Regional Board, Dennis Dickerson, has agreed to defer his formal action on the proposed SUSMP program until the end of 1999. The intervening time allows affected parties to examine the draft policy and explore underlying economic and environmental issues that need more attention.

This proposed policy is only a beginning step in what will be a continuing process of other rules designed to control and manage non-point source waters in watersheds throughout the SCAG region. Nothing better dramatizes the hazards of unmanaged non-point source waters than the beach closures prompted by highly-contaminated runoff flows. (By comparison, point source regulations are well-developed and already operating successfully.)

The Task Force has had some preparation for this issue with our prior consideration of the Los Angeles Regional Board's court-ordered mandate to set Total Maximum Daily Loads (TMDLs) for waterbodies in the Los Angeles Basin. Also, the Task Force has been briefed on Santa Monica's Dry Weather Runoff Reclamation Facility, a coastal treatment investment that will clean up 500,000 gallons per day.

A content of a Times article is attached that describes the recent Regional Board hearing on the SUSMP issue.

Members of the Task Force are urged to listen to each of the presentations with special attention for ways that SCAG might be able to facilitate larger-scale clean water solutions for cities in the region's watersheds. Staff is convinced that real solutions must eventually consider more than new construction sites if the region-wide contaminated stormwater runoff problems are to be solved.

XAVIER SWAMIKANNU

Xavier Swamikannu provides regulatory oversight at the California Water Quality Control Board, Los Angeles Region for the municipal storm water programs in the county of Los Angeles. The programs he manages cover the County of Los Angeles and 84 cities, the City of Long Beach, and the California Department of Transportation.

Xavier was a member of the original State team that developed and implemented storm water regulatory programs for industry, municipalities, and construction activity in California pursuant to the 1987 amendments to the Federal Clean Water Act. He participates on several state, federal, and regional technical committees on storm water issues. He has published several technical papers in scientific journals and conference proceedings, and been a presenter at national U.S. EPA conferences. His expertise covers all aspects of the National Pollutant Discharge Elimination System (NPDES) program.

Dr. Swamikannu holds a masters of science in environmental sciences from Texas Christian University and a doctorate in environmental science and engineering from UCLA. He has been with the California Water Quality Control Board – Los Angeles Region since 1989.

Los Angeles Times Archives & Professional Research

Sunday, October 3, 1999
Home Edition
Section: Metro
Page: B-1

SPECIAL REPORT " Cities upset about proposed rules for cutting storm runoff from new developments are raising . . .; A Torrent of Opposition;
By: MARLA CONE, TIMES ENVIRONMENTAL WRITER

Cities throughout Los Angeles County--which suffers the worst urban runoff problem in the nation--are waging an intense battle against a proposed mandate that would help prevent toxic pollutants, bacteria and viruses from contaminating ocean waters.

The standard proposed by the region's water quality board would force Los Angeles County cities to fundamentally change how large new projects--from shopping centers to housing subdivisions--are built. If enacted, it would be the U.S.' most far-reaching restrictions on polluted storm water.

Cities would have to ensure that new developments capture either 85% of the runoff from a storm in a 24-hour period or the first three-fourths of an inch of rain. The standard would apply to new commercial projects of more than 100,000 square feet and all new gas stations, auto repair garages, restaurants and subdivisions of 10 or more houses.

Officials of about 50 cities, including Los Angeles and other beach communities, have joined with developers to fight the proposal through letters and in speeches at a packed public hearing held last month by the Los Angeles Regional Water Quality Control Board.

Because the costs of complying with the proposal are unknown, the city leaders are unconvinced that the benefits would be worth the expense, and they are asking for a thorough economic study. They also want any standards to be voluntary.

"Obviously a beach city wants to have its beaches pristine, but it's a matter of cost," said Neil Miller, Manhattan Beach's public works director.

Of the county's 85 cities, only Santa Monica--already a leader in cleaning up its polluted beach waters--has supported the runoff limits.

"The amount spent . . . is most likely a small percentage of total construction costs. The benefits, however, are regionwide," wrote Craig Perkins, the city's director of environmental and public works programs, in a letter to the water agency.

The agency's executive officer, Dennis Dickerson, does not need the support of his governing board or the cities to set the runoff limits. But he has wavered in the face of the opposition, and this month he postponed any action until at least January.

Dickerson said he wants to first try to educate city leaders and persuade them to change their minds or, if necessary, agree to a compromise. He declined to say, though, whether he is willing to turn the limits into voluntary guidelines.

"Hopefully, we can craft a document that will respond to some of the concerns of the cities but also ensure a strong level of environmental protection," he said.

The Los Angeles region, with so many people and so much pavement, faces an almost insurmountable challenge in cleaning up its voluminous runoff. The debate over how to contain the pollution has dragged on for a decade.

Massive amounts of oily waste, pesticides, metal residue and other pollutants flow to the sea from streets and parking lots, even on dry summer days. Runoff also carries human viruses and bacteria from sewage that can give swimmers, especially children, diarrhea, respiratory infections and other illnesses.

Since 1986 the federal Clean Water Act has required municipalities to reduce storm water runoff "to the maximum extent practicable." But experts say Southern California lags behind many other urban areas because of the huge size of the task and resistance to land use restrictions.

In the Southland, attempts to wrest any control of development from municipalities have long been considered taboo, and the runoff measure has allied cities with developers in a fight against local environmentalists.

Mark Gold, executive director of the environmental group Heal the Bay, said the push for standards governing new development "has been our biggest fight for a decade" in the campaign to clean up runoff, the leading source of pollution in Santa Monica Bay.

David Beckman, a senior attorney with the Natural Resources Defense Council, accused the cities of "a bunch of denying and deflecting and delaying." The proposal is far from a cure-all but "shows that the water board is finally getting serious about storm water control," he said.

"It only covers new development and redevelopment, so it should not be construed as something that will magically solve the storm water problem. But it should prevent it from getting worse," Beckman said.

On even a dry summer day, polluted runoff from the county's 10 million people would fill the Rose Bowl. Year-round, it contaminates beaches within roughly 100 yards of river mouths and storm drains. On a rainy day, the runoff renders all beaches unsafe.

In Los Angeles County, most runoff flows into three waterways: Ballona Creek, which empties into the ocean at Marina del Rey; Malibu Creek, which ends at Surfrider Beach; and the Los Angeles River, which flows into Long Beach Harbor. Smaller storm drains are sprinkled along the coastline.

The proposal is designed to sharply reduce runoff from new buildings in all but severe storms.

Developers and city planners would have a range of options for compliance. They could leave grassy swales and other open space so runoff could seep into the ground instead of flowing into storm drains. However, because land is at a premium in the county, most developers are likely to seek other options, such as building detention ponds, using permeable pavement or installing filters in curbside drains.

Xavier Swamikannu, who directs the regional board's storm water program, stresses that cities would have the flexibility to decide how each individual project must comply. The standards are not meant to slow development, he said, but rather to ensure that developments are more environmentally sound.

UCLA environmental engineer Mike Stenstrom, a nationally known expert in urban runoff, said the storm water limits are reasonable and can be achieved with relatively simple and inexpensive design changes at developments.

Builders, however, say there is insufficient scientific basis for setting a specific numerical limit for capturing storm water--and little data on the costs. Every project and piece of land is different, they say, so hard and fast standards are unreasonable. New Projects Unfairly Targeted, Builders Say

Builders also complain that new projects are being unfairly targeted even though existing development pollutes the most.

"We are concerned that this approach will render some sites undevelopable, placing an unfair burden on property owners and developers," said John R. Burroughs, vice president of Commerce Construction Co.

Ray Pearl of the Building Industry Assn. of Southern California said providing housing is just as critical as protecting the environment. "We would ask you not to forget human habitat," he told the water board at a Sept. 16 hearing.

Azusa City Engineer Nasser Abbaszedeh said the proposal could prompt developers to move to neighboring counties that have no runoff limits. "This would cause an inherent regional inequity throughout Southern California," he said.

The most vocal opposition has come from cities miles from the coast, in southeastern Los Angeles County and the San Gabriel Valley. But surprisingly, the debate has not pitted inland cities against coastal ones. Cities such as Long Beach, Manhattan Beach and Redondo Beach have shorelines contaminated with runoff flowing largely from inland areas, but even they do not support standards that tell cities how to govern development.

"How much can you foist on the developer and how much can you foist on local government? Do you impose a $20,000 or $30,000 cost on each development without knowing the benefits?" Miller of Manhattan Beach asked. "Nobody is opposed to cleaning up storm water. But to just throw a numerical limit out there and say, 'Figure out how to do it'--that's tough for engineers to accept. It just seems premature."

In unincorporated areas of Los Angeles County, builders already must control runoff from the first 0.75 of an inch of rain from each storm. County officials agreed to the requirement, which became effective in June, in a settlement of a lawsuit with local environmentalists.

Outside California, several counties and cities, especially along Chesapeake Bay, have already imposed similar runoff standards--some more stringent. The Los Angeles County program, however, would be the largest. Orange, Ventura and San Diego counties also face threats from runoff, but they have separate storm-water permits with regional boards that impose no runoff limits.

Since July 30, existing businesses and developments in L.A. County have been required to follow a set of "best management practices" outlined in a storm-water permit enforced by the regional water board. But it contains no numerical limits for the volume of runoff controlled. For example, auto repair shops are told to clean up oil leaks and cover waste storage areas, and cities have stenciled "No Dumping" on gutters and mounted multimillion-dollar public education campaigns.

Water officials, however, say public education and general guidelines will never go far enough. Instead, they say, communities must change the very way they are designed.

Swamikannu said runoff pollution is so severe in the Los Angeles area that setting firm limits on new development is "just a starting point" toward meeting federal standards, which require all waters to be safe for fishing and swimming.

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A PEPPERDINE MBA

Wednesday, October 6, 1999

Confronting Dirty Water Runoff

With endless miles of asphalt, Los Angeles County has the worst urban runoff problem in the nation. Its severity should dictate adoption of a controversial proposal to help curb the flow of gunk into local bays.

Massive amounts of pesticides, metal residue, oily waste and solid garbage flow to the sea in runoff from lawns, parking lots and streets. Storm drains also carry human viruses and bacteria from sewage that can sicken swimmers. Although most severe in Los Angeles, runoff has fouled many Southern California beaches, forcing closures in Huntington Beach for much of last summer, for example.

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Since 1986, the federal Clean Water Act has required cities to cut storm water runoff "to the maximum extent practicable." But because this form of pollution is so diffuse--virtually every parking lot and street is covered with a thin, oily film--fixes are hard to come by. Until recently, communities mainly exhorted residents not to hose driveway debris into the street or throw trash down storm drains.

Now the Los Angeles region's water quality board has outlined a promising new approach. Yes, it will cost money, and no, it won't, by any stretch, completely solve the problem. But proposed new standards could well keep ocean pollution from worsening and help prevent beach closings.

Cities would have to ensure that new developments capture 85% of their rainstorm runoff. The rules, which the Los Angeles Regional Water Quality Control Board is considering, would apply to new commercial projects of more than 100,000 square feet, all new gas stations, auto repair garages, restaurants and subdivisions of 10 or more new houses. Developers and city planners could adopt a variety of strategies to contain runoff.

Some localities outside California already have imposed similar runoff standards, but the Los Angeles program would be the largest. Nearby counties like Orange and Ventura are just beginning to grapple with this tough issue. Huntington Beach officials, still puzzled about how to prevent a repeat of last summer's pollution, are looking for funds to study the problem.

The Los Angeles water board's executive officer can adopt the new development standards; litigation would be the only other recourse. But a torrent of opposition from nearly every city in the county, including Los Angeles, has caused him to postpone a decision until next year. That opposition may be a reason to consider broader alternatives, but the board should follow through on this good start in dealing with a tough problem. Los Angeles should be a leader in coastal cleanup instead of everyone's worst example.

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MEMORANDUM TO THE WATER POLICY TASK FORCE

October 6, 1999

TO: *Members of the Water Policy Task Force*

FROM: *Daniel E. Griset, Sr. Planner, X895, griset@scag.ca.gov*

SUBJECT: *The Proposed SUSMPs as Viewed by the Los Angeles Environmental Community*

RECOMMENDATION:

Receive comments for policy consideration.

BACKGROUND:

Mr. David Beckman, Senior Attorney with the National Resources Defense Council, will give an Environmental Organization's assessment of the proposed SUSMPs.

The Natural Resources Defense Council is a national environmental organization with over 400,000 members. Mr. Beckman heads the Coastal Water Quality Program in NRDC's Los Angeles office, where his practice has focused on matters relating to Clean Water Act enforcement, including storm water pollution control and TMDLs. Mr. Beckman litigated major storm water pollution enforcement actions in 1995 and 1996 against Caltrans and Los Angeles County. In 1997, Mr. Beckman developed and brought litigation against the EPA to enforce the duty to develop TMDLs in the Los Angeles region, and this case resulted both in a consent decree in the Los Angeles area and widespread interest in TMDLs across California.

Mr. Beckman is currently a member of the Independent Commission determining the fate of the Belmont Learning Center complex, a proposed 5000 student high school near downtown Los Angeles that was built on part of a former oil field.

After graduating from Harvard Law School in 1991, Mr. Beckman practiced for three years in private practice prior to joining NRDC in 1995.

Attached to this memorandum is a copy of the presentation slides from the environmental coalition that gave testimony at the Regional Board's hearing on SUSMPs on September 16, 1999.

COMMENTS ON PROPOSED STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPs)

Los Angeles Regional Water Quality Control Board
September 16, 1999

Presented by:
Natural Resources Defense Council
Heal the Bay
Santa Monica Baykeeper
Friends of the Los Angeles River
American Oceans Campaign

Outline of Comments in Support of Staff's Recommendation Regarding Approval of SUSMPs with Numeric Performance Standard

I. The Los Angeles Region Needs the Protection Provided by the SUSMPs Targeted to Treat or Infiltrate Substantial Quanitities of Runoff from New and Redevelopment.
   - A. The Region's Severe Storm Water Problem
   - B. The Role of New and Redevelopment in Creating the Problem

II. The Proposed Numeric Performance Standard Are Based on Careful, Expert Analysis and the Experience of Municipalities Across the Country
   - A. Other Municipalities Across the Country are Adopting Similar Standards
   - B. The Proposed Standard was Tailored to Local Conditions by Experts

III. The Permit and the Clean Water Act "MEP Standard" Provide a Strong Legal Foundation for the Staff's Proposal

IV. Staff's Proposal Must be Strengthened Further to Address Issues of Coverage and Required Water Quality-Based Limits
   - A. Staff's Proposal Should Apply to a Broader Scope of Projects
   - B. Federal Clean Water Act Anti-Degradation Requirements
   - C. Clean Water Act Prohibition on New Sources to Impaired (303(d) listed) Waters
   - D. Clean Water Act Prohibition on Discharges that "Cause or Contribute" to Violation of Water Quality Standards

I.

THE LOS ANGELES REGION NEEDS THE PROTECTION PROVIDED BY THE SUSMPs *AND* A NUMERIC PERFORMANCE STANDARD

LOS ANGELES AREA WATERS ARE EXTREMELY POLLUTED

- The LA region has been recognized by experts and government officials as having perhaps the most severe storm water pollution problem in the Nation.

[*Los Angeles Times* (September 5-6, 1999)]

- Southern California Coastal Water Research Project reports that storm water and urban runoff are the leading source of water pollution in the LA area, and that storm water pollution for pollutants of concern has increased between two and seven hundred percent during the last two decades.

[SCCWRP Annual Reports; see also *Los Angeles Times*, supra]

- **EPA officials have stated that the LA region lags behind "virtually everyplace" in the nation in reducing storm water pollution.**

[Id.]

- **Los Angeles, while covering a small part of the land area of the State, is home to over 50% of all impaired waters in California.**

[1998 California Section 303(d) List]

THE ROLE OF NEW AND REDEVELOPMENT IN CREATING THE PROBLEM

- Storm water pollution has two main causal components, increased volume and velocity of surface runoff and the concentration of pollutants in runoff.
- Development contributes directly to both factors.
- In particular, by creating impervious surface, development has dramatic effects on increasing the quantity and quality of storm water runoff:

COMPARE...

A 1-inch rainstorm on a 1-acre natural meadow typically produces:	The same storm on a 1-acre paved parking lot produces:
218 cubic feet of runoff (enough to fill a standard office to a depth of 2 feet)	3,450 cubic feet of runoff, nearly sixteen times the meadow (and enough to fill three offices completely)

- **On a larger scale such as the LA area, the impact is even more dramatic, with pre- and post-development discharges in a watershed increasing by 200 times or more [e.g., Des Plaines River, Illinois].**

[Source: Storm Water Strategies: Community Responses to Runoff Pollution (NRDC, 1999)]

II.

THE PROPOSED NUMERIC PERFORMANCE STANDARD IS BASED ON CAREFUL, EXPERT ANALYSIS AND THE EXPERIENCE OF MUNICIPALITIES ACROSS THE COUNTRY

STANDARDS LIKE THOSE PROPOSED BY STAFF ARE NOW ESSENTIAL

- **"A fundamentally different approach toward development [is] needed to reliably protect streams and other aquatic resources."**

[Site Planning for Urban Stream Protection. (Center for Watershed Protection), 1995]

- **"...Structural best management practices (BMPs) for stormwater quality enhancement is the cornerstone of stormwater management in newly developing and redeveloping urban areas."**

[Urban Runoff Quality Management, American Society of Civil Engineers]

- Structural BMPs have been thoroughly tested and are highly effective.

  Common storm water treatment methods, including wet and extended-detention ponds, oil separators, vegetated swales and filter strips, constructed wetlands, various infiltration practices, and media filters can capture 75% to as much as 90% of the solids and lead.

  Copper and zinc reductions of half or more are the rule in these facilities.

  Infiltration can stop the discharge to surface waters of more than 95% of the solids, metals, and bacteria.

- Cities Across the Country are implementing structural stormwater control requirements similar to or more stringent than that proposed by Staff.
  - ✓ Alexandria, Virginia (zero pollutant loading standard)
  - ✓ Montgomery County, Maryland (treatment for 1-inch storm)
  - ✓ Denver, Colorado (80th percentile runoff event)
  - ✓ Santa Monica, California (1-inch/24 hour parking lot standard)
  - ✓ County of Los Angeles (.75 inch/broader scope of subject development)

THE STANDARD PROPOSED BY STAFF HAS BEEN TAILORED TO LOCAL CONDITIONS BY EXPERTS

- Bases of the standard:
  - ✓ Consent Decree in *NRDC/Baykeeper v. Los Angeles County*
  - ✓ Dr. Richard Horner, national storm water expert
  - ✓ County of Los Angeles Experts (Woodward-Clyde)
  - ✓ Independent experts from Camp Dresser and McKee
  - ✓ Empirical data from leading texts (California Storm Water BMP handbook, STORM model)

- Proposed Standard is Less Stringent than NRDC Experts Believe Necessary
- Proposed Standard is Less Stringent than Adopted by County

III.

THE PERMIT AND THE CLEAN WATER ACT "MEP STANDARD" PROVIDE A STRONG LEGAL FOUNDATION FOR STAFF'S PROPOSAL

- The Clean Water Act specifically contemplates structural controls

  [40 C.F.R. Section 122.26]

- MEP Standard places burden on dischargers to implement BMPs unless they can show they are unnecessary:
  - ✓ "[A Discharger] shall have the burden of showing that it has met the "maximum extent practicable" standard in proposing or rejecting BMPs for implementation."

    [NRDC/BayKeeper v. Caltrans, United States District Court, Central District of California (No. CV 93-6073-ER)]

- 1996 Storm Water Permit for Los Angeles County provides:
  - ✓ SUSMPs and guidelines for their preparation must be developed. [Section II.A.1.C (page 34)];
  - ✓ "at the minimum, SUSMPs and guidelines shall be prepared for the following development categories [those at issue in Staff's proposal]."
  - ✓ all permittees must "implement [ ] a program for planning measures consistent with the [SUSMPs]." [Section III.A. and A.2]

IV.

STAFF'S PROPOSAL MUST BE STRENGTHENED FURTHER TO ADDRESS ISSUES OF COVERAGE AND REQUIRED WATER QUALITY-BASED LIMITS

MORE PROJECTS MUST BE COVERED

- Staff's Proposal would apply to a narrow slate of projects
  - ✓ An Additional SUSMP for Environmentally Sensitive Areas is Necessary
  - ✓ The County of Los Angeles is applying the treatment/infiltration standards to a broad array of development projects.

WATER-QUALITY BASED LIMITS ARE ALSO NECESSARY

- The SUSMP standards are performance-based and do not represent water quality-based effluent limits, which may impose more stringent requirements on development.
- Many provisions of law may require that no new development be authorized when it will impact polluted waters and/or that additional limits be imposed so that discharges do not "cause or contribute" to violations of water quality standards.

- ✓ Federal Clean Water Act Anti-Degradation Requirements
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COMMENTS ON PROPOSED STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPs)

Los Angeles Regional Water Quality Control Board
September 16, 1999

Presented by:
Natural Resources Defense Council
Heal the Bay
Santa Monica Baykeeper
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V.

CONCLUSION

R0069438

MEMORANDUM TO THE WATER POLICY TASK FORCE

October 6, 1999

TO: *Members of the Water Policy Task Force*

FROM: *Daniel E. Griset, Sr. Planner, X895, griset@scag.ca.gov*

SUBJECT: *The Proposed SUSMPs as Viewed by the Building Industry Association*

RECOMMENDATION:

Receive comments for policy consideration.

BACKGROUND:

Mr. Richard A. Watson, MA, AICP, Principal of a southern California urban and regional planning firm, has been one of the principal private sector contributors in the development of workable general permits for stormwater discharges associated with construction activity. Mr. Watson will give a building industry assessment of the proposed SUSMPs and offer suggestions for better managing stormwater and controlling this kind of source water pollution.

RICHARD A. WATSON, MA, AICP

Richard Watson & Associates
(949) 855-6272 phone
rwarich@home.com

Richard Watson is Principal of Richard Watson & Associates, L.L.C. (RWA), an urban and regional planning firm located in Mission Viejo, California. He is a geographer/planner with over 28 years of professional planning and development experience. He has taught geography and planning at the university level and served as a planner in both the private sector and the public sector. He has nine years experience in storm water quality issues.

In 1993, he formed Richard Watson & Associates. RWA works independently or in collaboration with other firms and consulting associates to provide planning and problem-solving services for private and public sector clients. The firm's practice is divided between new town planning and storm water quality.

Mr. Watson received his university education at Stanford University, the University of California at Los Angeles and the University of Alberta. He holds a B.A. degree and an M.A. degree in Geography from U.C.L.A. He completed all requirements, except the dissertation, for a Ph.D. in Geography at the University of Alberta, where his specialization was urban and regional planning.

From 1970 to 1974, Mr. Watson taught urban and regional planning courses at the University of Alberta and Oklahoma State University. As Coordinator of Geography Extension at Oklahoma State, he managed applied research projects as a consultant to cities, sub-state planning districts, the State of Oklahoma and the Ozarks Regional Commission.

Mr. Watson served from 1974 to 1978 as Regional Planner for the Ozarks Regional Commission, a multi-state economic development commission composed of the states of Arkansas, Kansas, Louisiana, Missouri and Oklahoma. He was responsible for the formulation of a new Economic Development Action Plan for the 281,000 square mile region and development of a regional energy program. Mr. Watson supervised the Commission's annual State Investment Planning process and reviewed individual infrastructure investment projects and the preparation of the Commission's annual reports. He coordinated public and private sector advisory groups and worked closely with the governors' offices in the five states and with numerous federal, state and local agencies to achieve agreement on the development and implementation of regional programs.

RICHARD A. WATSON (Continued)

From 1978 to 1993, Mr. Watson was employed by the Jack G. Raub Company and Mission Viejo Company where he was instrumental in the planning and implementation of the Aliso Viejo and Mission Viejo Planned Communities. At the Jack G. Raub Company, he was Director of Advance Planning. This department included Economic Planning, Environmental Analysis, Housing and Community Development, Policy Planning and Resources Planning sections. As Director of Planning Research at Mission Viejo Company, he was responsible for numerous technical and policy issues, including compliance with storm water quality requirements. He worked with numerous engineering,design and construction disciplines as well as with many public and private organizations. Mr. Watson also supervised Mission Viejo Company's wetlands program, including securing appropriate permits and agreements, as well as the development of a major wetlands mitigation program.

Mr. Watson has extensive experience in the development and implementation of the storm water quality program in California. Since early 1991, he has been an active participant on the California Stormwater Quality Task Force. Currently, Mr. Watson is a member of the Executive Committee of the Task Force and Chairs the Task Force's TMDL/Watershed Management Work Group. He also was a member of an Urban Development Technical Advisory Committee for review of the state's Nonpoint Source Pollution Management Program. This involved working with staff members of the State Water Resources Control Board, the California Coastal Commission, various Regional Water Quality Control Boards and others to review the adequacy of nonpoint source pollution management in California.

He has been one of the principal private sector contributors in the development of a workable General Permit for Storm Water Discharges Associated with Construction Activity in California. In addition, he served on the Technical Advisory Panel for the development of the Construction, Municipal and Commercial/Industrial Best Management Practices Handbooks for California. Mr. Watson has had practical experience in preparing Storm Water Pollution Prevention Plans and Water Quality Management Plans for private sector clients. He served as a consultant for the development of post-construction best management practices plan for a major transportation corridor (toll road) in Orange County, California. He is currently a member of a consulting team assisting the California Department of Transportation (Caltrans) with storm water quality issues. He is managing Caltrans' San Diego Water Quality Control Study.

RICHARD A. WATSON (Continued)

Mr. Watson assisted the County of Orange (California) with development of a Drainage Area Management Plan, in particular those portions dealing with construction and new development. He helped to prepare a long-term financing plan for the County storm water program.

Mr. Watson serves on the Southern California Water Resources Committee of the American Public Works Association and is a member of the California Building Industry Association Water Resources Task Force. He is often an invited speaker at conferences and workshops dealing with implementation of the storm water program.

During his more than 28 years of professional planning experience, Mr. Watson has managed and contributed to a diverse group of projects. He has worked in both the private and public sectors. He has contributed to the development of public policy related to planning, development and environmental management. He has also contributed to the development of public policy related to planning, development, water quality and environmental management.

Mr. Watson is a member of the American Planning Association, the American Institute of Certified Planners, the American Public Works Association, the California Building Industry Association, the Pacific Rim Council on Urban Development and the Urban Land Institute.

MEMORANDUM TO THE WATER POLICY TASK FORCE

October 6, 1999

TO: *Members of the Water Policy Task Force*

FROM: *Daniel E. Griset, Sr. Planner, X895, griset@scag.ca.gov*

SUBJECT: *The Proposed SUSMPs as Viewed by the City of Downey*

RECOMMENDATION:

Receive comments for policy consideration.

BACKGROUND:

Mr. Desi Alvarez, Director of Public Works at the City of Downey, will give his city's view of the proposed SUSMPs, as well as alternative ideas for controlling stormwater pollution. He is responsible for general oversight of the city's stormwater programs and implementation of the stormwater permit.

Mr. Alvarez took his undergraduate education at Loyola University of Los Angeles before completing a master's degree in Civil Engineering at U.C. Davis, concentrating on water resources and environmental engineering. He taught civil engineering at CSU Chico before entering the private consulting business. Since 1986 he has worked in the public sector: as City Engineer in Santa Monica (he began the studies that have produced the Dry Weather Runoff Reclamation Facility), Director of Public Works/City Engineer in Redondo Beach, and City Engineer in Glendale.

Mr. Alvarez, Chair of the Los Angeles County NPDES Sormwater Permit Executive Advisory Committee, was active in the negotiation of the current permit.

MEMORANDUM TO THE WATER POLICY TASK FORCE

October 6, 1999

TO: *Members of the Water Policy Task Force*

FROM: *Daniel E. Griset, Sr. Planner, X895, griset@scag.ca.gov*

SUBJECT: *The Proposed SUSMPs as Viewed by the City of Calabasas*

RECOMMENDATION:

Receive comments for policy consideration.

BACKGROUND:

Ms. Heather Lea Merenda, Storm Water Program Manager at the City of Calabasas, will give her city's view of the proposed SUSMPs, as well as describe programs currently operating as a result of the City's existing development policies.

For the past year, Ms. Merenda has served as the Storm Water Program Manager for the City of Calabasas. Her primary responsibilities includes NPDES Permit compliance, implementing and coordinating the volunteer water quality monitoring program, development review for water quality elements, enforcement, and outreach to the public, local school, City staff, and the business community. Prior to joining the City of Calabasas, Ms. Merenda worked for four years at Charles Abbott Associates. She worked with local governments in the areas of environmental compliance, and building and safety. She also worked for the Environmental Services Division for the City of West Hollywood.

Attached is a copy of the City's "Community Vision" along with the City's policy for "Urban Runoff Pollution Control".

Ms. Merenda holds a Bachelor of Arts degree in Geography with a minor Environmental Science from California State University Long Beach. Currently, she is working towards a Masters of Public Administration degree from California State University at Northridge.

Phone (818) 878-4242 X293
Fax (818) 878-4205

D. COMMUNITY VISION

The Calabasas General Plan is intended to be a vehicle for change. Simply stated, Calabasas' vision is that the future need not repeat the mistakes of the past. Through innovative approaches and not accepting the way things are just because they have always been that way, Calabasas will achieve excellence – in protecting the natural environment that attracted so many of its residents to the area, in managing its affairs in a manner that is consistent with local social values, in enhancing the physical appearance of the area's built environment, and in ensuring its residents a high quality of life.

> "...plan in full awareness of nature's forces, forms, and features...the sweep of the sun, the air currents, the peaks and hollows of the earth, rock and soil strata, vegetation, lakes and streams, watersheds, and natural drainage ways; and this awareness should obviously entail planning in harmony with the elements of nature. If we disregard them, we will engender countless unnecessary frictions and preclude those experiences of fitness and compatibility that can bring so much pleasure and satisfaction to our lives."

Long before the actual incorporation of the City of Calabasas, new development began to encroach into the community's rugged hillside areas and to threaten sensitive environmental areas. Residents recognized that only through local control and direct management of development review could community objectives be achieved and could local social values be translated into physical forms. The results of growth in the years preceding incorporation are, in many ways, inconsistent with local values; environmental destruction, traffic congestion, overly intense development, visual clutter, and a lack of community gathering places were cited by residents as being the primary community image problems that must be addressed by the General Plan.

Calabasas still possesses a beautiful natural setting which will be protected for the enjoyment of future generations. The current density of population within the community is low to moderate; continuation of this characteristic is a key part of Calabasas' vision. Thus, emphasis must be placed on the ways in which Calabasas residents can apply the local management control that was gained through incorporation to advance community values and translate them into physical forms. In recognition of the importance of retaining the characteristics that make Calabasas a special place, the City's General Plan and its conduct of community affairs must be strongly oriented toward protecting the natural environment, and managing the man-made environment, thereby ensuring that future growth occurs only in a manner that is consistent with local community values.

Calabasas is blessed with a citizenry that not only values a high quality of life and recognizes its responsibility to protect the area's natural environment, but is also willing to devote its energy to achieving those objectives. The General Plan is more than an expression of long-term philosophy, and presents much beyond a plan for land use and a growth management program. The General Plan presents a management program for the community's future which has resulted from a comprehensive community involvement program. This community involvement program integrated the efforts of numerous citizen committees that have provided valuable input since the City's incorporation. The General Plan also represents a multi-agency approach which recognizes the interrelationships between vital services and land use and environmental management decisions. It provides

concrete programs and an action agenda for Calabasas to follow in achieving its vision, which is expressed in three dominant themes:

- ***Environmental Responsibility*** -- preserving the area's remaining natural environment and living within the limits imposed by available resources;
- ***Local Management and Control*** -- accepting responsibility for managing Calabasas' affairs and its future in accordance with local values; and
- ***Community Image*** -- protecting Calabasas' special character.

ENVIRONMENTAL RESPONSIBILITY

Maintenance of a high quality of life is dependent upon a high quality environment. Thus, the area's natural environment is invariably cited as the key to Calabasas' desirability, and preservation of open space is generally cited as the community's number one priority.

As part of a large metropolitan region, Calabasas will continue to develop; however, this does not mean that degradation of environmental quality and loss of resources must be endured. Calabasas' position within the region creates tremendous development pressures. Protecting the area's remaining natural hillsides, ridgelines, and significant habitat areas, as well as preserving remaining open lands in their natural state, are important concerns of area residents. Calabasas' view of environmental issues is a broad one, extending beyond the City's immediate physical environment to such issues as water resource conservation, solid waste management, night sky and glare considerations, air quality, and energy conservation. This broad view of the environment also extends geographically, and is reflected in the community's participation in regional planning and visioning programs, including programs that only indirectly affect the City of Calabasas.

Environmental Responsibility Goals

To secure better management and protection of environmental resources, the City of Calabasas is committed to:

- *broadening the application of environmentally conscious planning and design, establishing Calabasas as a community which acknowledges limits on natural resources, and lives within those limits;*
- *recognizing the area's natural environment as a critical community asset and a key component of Calabasas' quality of life and establishing a system of environmental management wherein the natural environment will be protected out of a sense of responsibility and commitment to environmental quality, placing a higher priority*

on environmental protection and open space preservation than on expansion of urban or rural development;

- *defining the area's environmental carrying capacity, and limiting the level, rate, and distribution of population and economic growth to that which is consistent with improved environmental quality and the availability of natural resources; and*

- *minimizing the environmental impacts of its own activities by making environmental sensitivity a key concern in the provision of municipal services and facilities, and incorporating environmentally conscious construction and management practices in the development and maintenance of municipal facilities.*

LOCAL MANAGEMENT AND CONTROL OF CALABASAS' FUTURE

The General Plan represents Calabasas' commitment to take responsibility for managing its own future, and to guide the type, amount, and location of development in a manner consistent with local social values – to preserve the beauty and natural environment of the area, to ensure the adequacy and integrity of services and facilities, and to protect and enhance the quality of life of its citizens.

Without the local control and ability to manage daily community affairs that are afforded to cities, there is little assurance that development decisions will reflect local social values or the long-term commitment needed to adequately protect the area's environment. Thus, area residents, individual homeowners' associations, and the Federation of Las Virgenes Homeowners' Associations became and continue to be actively involved in civic affairs and the County's development review and planning processes. In discussing the lessons that were learned from the events of the past, Calabasas citizens often express the message that only through concerted, joint action could local residents be effective in inserting community values into the review of development.

Local Management and Control Goals

To take responsibility for managing its future and guiding the type, intensity, and location of development in a manner consistent with local social values to preserve the area's beauty and natural environment to ensure the adequacy and integrity of services and facilities, and to protect and enhance the quality of life of its citizens, the City of Calabasas will:

- *formulate a development review program to implement General Plan policies that provides a clear set of rules by which development proposals will be reviewed, including specific performance standards which describe the City's expectations of the quality and responsibilities of new development;*

17.56.020 - Applicability

A. **Applicability of provisions.** The provisions of this Chapter apply as detailed below, to any proposed land use or development involving grading activities, or the construction of new structures or paving. Compliance with the provisions of this Chapter shall be required through land use permit or subdivision conditions of approval. Any necessary pollution control measures shall be installed prior to construction, or site/structure occupancy, as deemed appropriate by the City. In all cases, the applicant/permittee is responsible for ensuring compliance with the provisions of this Chapter.

1. Applicants proposing construction on **parcels of 5 acres or more**, or any **industrial facilities** shall be required to submit a *Stormwater Pollution Prevention Plan* (SWPPP) in compliance with the requirements of the Federal Clean Water Act, U.S. Environmental Protection Agency (EPA), and the California Water Resources Board. The application shall also include a *Hazardous Materials Handling and Spill Response Plan* related to construction activities, and in the case of industrial facilities, shall also address operations after construction. The applicant shall submit a copy of the SWPPP to the City prior to the processing of any land use permit or subdivision application, or the granting of any construction permits.

2. All new or re-built retail/commercial/industrial **parking lots** shall provide a sub-surface filtering system for oil & grease contaminates as part of their application in compliance with the Administrative Policies of the City.

3. All projects shall submit a Runoff Mitigation Plan which illustrates the Best Management Practices they will be utilized to reduce stormwater flow and to prevent pollutants from running off the built project as part of the application and initial planning process.

B. **Responsibility for administration.** This Chapter shall be administered by the City Engineer or his or her designee in coordination with the Director of Planning and Building Services.

C. **Regulatory consistency.** This Chapter shall be construed to assure consistency with the requirements of:

1. The Federal Water Pollution Control Act, 33 USCS § 1251 et seq., and the applicable implementing regulations;

2. The mandates and rulings of the US Environmental Protection Agency (EPA);

3. The NPDES permit of Los Angeles County and its "co-permitees";

4. The Calabasas General Plan; and

5. Other existing or future NPDES Permits and any amendments, revisions or reissuance thereof by either Federal, State, County, or City regulatory agencies.

17.56.030 - Urban Runoff Mitigation Plan Requirements

The following runoff reduction requirements shall apply to all persons submitting applications for New Development within the City, whether fulfilled by the Federal SWPPP format, by the less detailed City *Runoff Mitigation Plan* (RMP), or as an additional measure.

A. **Submittal of Runoff Mitigation Plan.** At the time of submittal of an application for the first planning approval for a New Development project, an applicant shall be required to submit to the City Engineer either a *Runoff Mitigation Plan* to the City Engineer, or copy of Notice of Intent (NOI) filed with the Regional Water Quality Control Board.

B. **Goal for runoff reduction.** In developing a Runoff Mitigation Plan, an applicant shall demonstrate an effort to reduce projected runoff for the project by 20 percent from the base 1985 10-year storm basis, through incorporation of design elements or principles which address each of the goals set forth below in Subsections B.1, B.2, and B.3. The design elements utilized by an applicant may, but are not required to, include those provided on the list below, with the exception of Subsection B.2.b which is required where applicable. Although design elements are set forth as if they address only one goal, in many cases they address more than one and can be used to address multiple goals in achieving the reduced runoff to be achieved by the mitigation plan.

1. **Increase permeable areas.** The following measures shall be used to increase the permeable areas on the site.

   a. To slow runoff and maximize infiltration, the percentage of a project site shown in the following table shall be permeable area, based on the applicable zoning district. The area may include vegetation, pervious paving materials and porous materials for or near walkways, which increase the amount of runoff seepage into the ground. Permeable surface materials can include wood decking materials, brick or stone with spaces to allow percolation between stones, and similar methods.

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MINIMUM PERCENTAGE OF SITE AREA REQUIRED TO BE PERVIOUS SURFACE, BY APPLICABLE ZONING DISTRICT

Zoning District or Development Feature	Minimum Pervious Surface
RS - Sites of less than 1/3 acre	50%
RS - Sites of 1/3 acre or more	65%
RM - Multi-family projects	45%
RM - Mobile home parks	25%
HM	86%
RR	70%
RC	65%

Zoning District or Development Feature	Minimum Pervious Surface
CL	28%
CR	22%
CO	24%
CB	28%
CT	28%
CMU	38%
All parking lots	30%

b. Use natural drainage, detention ponds or infiltration pits so that runoff may collect and seep into the ground and reduce or prevent off-site flows;

c. Divert and catch runoff through the use of drainage swales, berms, green strip filters, gravel beds and french drains; and

d. Construct driveways and walkways from porous materials to allow increased percolation of runoff into the ground.

2. **Minimize runoff.** Minimize the amount of runoff directed to impermeable areas and/or maximize storm water storage for reuse:

a. Install rain gutters and orient them towards permeable surfaces rather than driveways or nonpermeable surfaces so that runoff will penetrate into the ground instead of flowing off-site;

b. Modify grades of property to divert flow to permeable areas and to minimize the amount of storm water leaving the property;

c. Use sediment traps to intercept runoff from drainage areas and hold or slowly release the runoff, with sediments held in the trap for later removal;

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d. Use retention structures or design rooftops to store runoff. Utilize subsurface areas for storm runoff either for reuse of to enable release of runoff at predetermined times or rates to minimize the peak discharge into storm drains. Cisterns are also a possible storage mechanism for reuse; and

e. Design curbs, berms or the like so as to avoid isolation of permeable or landscaped areas.

3. **Reduce parking lot pollution:**

a. All parking lots are required to use oil and water separators or clarifiers to remove petroleum-based contaminants and other pollutants which are likely to accumulate;

b. Direct runoff toward permeable areas and away from pollutant laden areas such as parking lots; and

c. Construct portions of parking lots from porous materials.

C. **Criteria for evaluation of mitigation plans.** The City's evaluation of each Urban Runoff Mitigation Plan will ascertain how well the proposed plan meets the combined goals set forth in Subsection B. above. Each plan will be evaluated on its own merits according to the particular characteristics of the project and the site to be developed.

D. **Waiver of Runoff Mitigation plan.** Full or partial waivers of compliance with this Section may be obtained by persons who apply on forms supplied by the City and show that incorporation of design elements that address the objectives set forth in Subsection B., above is an economic and physical impossibility due to the particular configuration of the site or to irreconcilable conflicts with other City requirements. Requests for waivers shall be granted or denied, in writing, by a three-member board comprised of one representative each from the City's Planning Division, City Engineering Department, and City Manager's Office. Their decision shall be forwarded to the Council for final approval.

E. **Compliance as condition of approval.** Compliance with an approved Runoff Mitigation Plan shall be a condition of approval of any required planning approval.

F. **Erosion control.** Erosion shall be controlled as follows:

1. All construction sites shall provide a plan to prevent erosion during construction to be approved by the City Engineer; and

2. Sloping lots shall provide soil holding plants as part of their ongoing landscape maintenance and planting for erosion control will be part of their *Water Conservation Landscape* plans. (See the Water Conservation Landscape Ordinance.)

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G. **Hazardous and toxic materials control.** The use of toxic and hazardous materials shall be controlled as follows:

1. Industrial facilities shall file a copy of their Hazardous Materials Handling and Spill Response Plan with the City Engineer;

2. Restaurants shall provide the City Engineer with appropriate plans for handling grease which may include bio-remediation; and

3. Commercial, industrial, retail and multi-family developments will provide a plan for reduced use of pesticides and herbicides as part of their Water Conservation Landscaping plans.

17.56.040 - Drainage Structure Stenciling

Where a catch basin or other drainage structure is required for a proposed project, written and/or graphic information discouraging the dumping, discarding, and/or discharge of pollutants into the storm drainage system shall be permanently affixed to the structure in a location approved by the City Engineer. The information shall be painted, stamped into the concrete, or provided on a metal plaque affixed to the structure as approved by the City Engineer or his or her designee.

17.56.050 - Pollution Prevention Agreements

Prior to final building inspection, or the filing of a Final Map, as applicable, the applicant shall enter into a Pollution Prevention Agreement with the City or other agency designated by the City. The agreement shall include, but is not limited to, the following provisions:

A. Authorization for the City or other agency designated by the City to inspect on-site pollution prevention facilities with respect to the accumulation and concentration of pollutants, garbage and/or debris, so as to prevent the discharge of pollutants, garbage and/or debris into streets and/or the storm drainage system;

B. Fair share participation in the periodic cleaning of storm drain facilities, increases in street sweeping, and increases in the emptying of roadside trash receptacles resulting from the project;

C. Fair share participation in the funding of the City's Public Information and Education Program(s) for the disposal of waste, recycling, and water conservation; and

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D. Requirements that any applicable conditions, covenants, and restrictions (CC&Rs) include statements encouraging homeowners, and persons in control of homes and businesses to:

1. Prevent the improper disposal of litter, lawn/garden clippings and pet feces into streets or other areas where runoff may carry pollutants into the storm drainage system;

2. Remove dirt, trash and debris from sidewalks and alleys that may contribute pollutants to urban runoff;

3. Recycle oil, glass, plastic, and other materials to prevent improper disposal into the storm drainage system;

4. Properly dispose of household hazardous waste to prevent improper disposal into storm drainage system; and

5. Properly use and conserve water.

17.56.060 - Required Best Management Practices

The owner, occupant or other person in charge of day-to-day operation of each premises within the City shall implement the best Management Practices or use Good Housekeeping Practices, as applicable, as follows.

A. For premises with parking lots with more than 25 parking spaces exposed to stormwater and which parking lots are associated with industrial or commercial activities, according to the United States Office of Management and Budget Standard Industrial Classification Code, the owner, occupant or other person in charge of day-to-day operation shall use BMPs to reduce the discharge of pollutants to the maximum extent practicable. Such measures may include rear sweeping or other measures, if effective.

B. For premises where machinery or other equipment which is repaired or maintained at facilities or activities associated with industrial or commercial activities, according to the United States Office of Management and Budget Standard Industrial Classification Manual, the owner, occupant or other person in charge of day-to-day operations shall use BMPs or other steps to prevent discharge of maintenance or repair related pollutants to the MS4.

C. For other premises exposed to stormwater, the owner, occupant or other person in charge of day-to-day operations shall use BMPs, if they exist, or other methods to reduce the discharge of pollutants to the maximum extent practicable, including the removal and lawful disposal of any solid waste or any other substance which, if it were to be discharged to the MS4, would be a pollutant, including fuels, waste fuels, chemicals, chemical wastes and animal wastes, from any part of the premises exposed to stormwater.

D. For premises which fall under the requirements for the Industrial SWPPP per Federal Law, the site "annual reports" and "monitoring reports" shall also be copied to the City Engineer.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION
JAN 23 2001

In Reply
Refer to: WTR-5

Dennis Dickerson
Executive Officer
California Regional Water Quality Control
Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

The purpose of this letter is to urge the Los Angeles Regional Board to adopt the proposed Standard Urban Storm Water Mitigation Plan (SUSMP) dated December 7, 1999 which was developed for post-construction storm water pollution control for specified new developments in Los Angeles County and Cities within the County. The SUSMP was developed pursuant to the requirements of NPDES permit No. CAS614001 for storm water discharges from the municipal separate storm sewer system (MS4) serving the County and its Cities.

We have reviewed the requirements of the proposed SUSMP and we believe they are consistent with the requirements of the CWA, applicable NPDES regulations, and EPA guidance on this matter. We understand that concerns have been expressed in particular regarding item #9 in the SUSMP which requires treatment (for the specified developments) for the runoff from the first 0.75" of rain. However, contrary to some of the comments received by the Regional Board, we believe this proposed requirement is fully within the authority of the Regional Board. NPDES regulations at 40 CFR 122.26(d)(2)(iv)(A)(2) specifically require that MS4 permittees include requirements in their storm water management programs for post-construction control measures to reduce storm water pollution from new developments after construction has been completed. EPA's guidance manual for Part 2 MS4 permit applications (EPA 833-B-92-002) indicates that "design criteria and performance standards" may be used to comply with this requirement. We believe that the Regional Board's proposal is fully consistent with this guidance.

The Regional Board's proposal would not be the first time that such numeric criteria have been used for new developments in California. The Regional Board's criteria already went into effect about 6 months ago in unincorporated areas of Los Angeles County via the recent NRDC settlement agreement. We understand from Regional Board staff that no evidence has surfaced thus far that the criteria are proving to be an excessive burden on developers. In addition, similar requirements are already in place in other parts of the country including the State of Florida (since 1982), and the Puget Sound area in Washington (since 1992); similar criteria have also been

proposed for the State of Maryland, and are already in effect in Prince George's County in Maryland. We understand that Regional Board staff have contacted these other States and again found that compliance with the standards is being widely achieved without an excessive burden on developers. As another example, the City of Phoenix requires retention facilities for the 100-year, 2-hour storm for new developments. The 100-year, 2-hour storm in the City of Phoenix is about 2.5" and substantially exceeds the storm which would need to be treated under the Regional Board's proposal. Nevertheless, compliance with the City of Phoenix requirement has also been achieved without an undue burden on the developers.

By specifying numeric criteria for post-construction storm water controls (as opposed to relying to a considerable degree on developers to include appropriate controls on their own), we believe that the proposal will better ensure that effective storm water pollution controls are included in the design of new developments. Thus, the proposal should lead to improved control of storm water pollution which the proposal cites as a significant factor currently contributing to the impairment of numerous rivers and streams in the Los Angeles area.

We are also concerned, however, that the Regional Board's proposal would exclude roofed surface areas in certain circumstances in the calculation of rainfall runoff. We believe that this provision could prove overly broad and may hinder implementation. As such, we would recommend that it be removed.

Thank you for the opportunity to review and comment on the proposed SUSMP. If you have any questions regarding this matter, please refer your staff to Eugene Bromley of the CWA Standards and Permits Office at (415) 744-1906.

Sincerely,

Alexis Strauss
Director, Water Division

cc: Xavier Swamikannu, Los Angeles Regional Board

Ventura Countywide Stormwater Quality Management Program

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CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Participating Agencies

Camarillo

County of Ventura

Fillmore

Moorpark

Ojai

Oxnard

Port Hueneme

San Buenaventura

Santa Paula

Simi Valley

Thousand Oaks

Ventura County Flood Control District

January 14, 2000

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Subject: Standard Urban Stormwater Mitigation Plan for Los Angeles County and Cities in Los Angeles County (SUSMP)

Dear Mr. Dickerson:

The Ventura County Flood Control District (NPDES Permit CAS063339) offers the following comments on the SUSMP proposed by the Regional Board for the stormwater programs in Los Angeles County. Our comments are provided given that approval of the numerical mitigation standard in the SUSMP has the potential to have a significant effect on the Ventura Countywide Stormwater Quality Management Program (Program) as well as other programs throughout the state.

Numerous treatment control Best Management Practices (BMPs) have been designed and built in Ventura County utilizing Program guidelines that deal with new development projects. The experience that we have gained has allowed us to take a practical look at design criteria. We feel strongly that when design standards are imposed, they should be written in a manner that is appropriate and technically sound. The proposed SUSMP, as presently written, will be extremely confusing to public agencies and engineers charged with designing facilities that comply with the specified criteria. The comments below are limited to technical issues that we feel need to be addressed and corrected prior to approval of the SUSMP document. Other details such as opportunities for regional facilities and credits for total design policies should be dealt with in a comprehensive stormwater quality mitigation plan.

1. SUSMP Design Standards

On September 13, 1999 in a letter to Dr. Xavier Swamikannu, we requested that the approach for the design of both volumetric and flow-based treatment control BMPs that has been successfully utilized in the design of BMPs on new development projects, i.e., *Unit basin storage volume design based on 70% capture of annual runoff and flow based design criteria based on 10% of the peak 50-year flow rate from impervious areas calculated using standard flood hydrology,* be considered as an option in the SUSMP. We subsequently provided back up documentation to show the equivalence of our 70% capture of annual runoff to the 0.75" rainfall capture criteria presented in the

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(805) 654-2002 FAX (805) 654-2424

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original SUSMP. The "SUSMP Summary of Comments Received and Response" (Response to Comments) misinterprets Ventura County's comment by indicating that we requested inclusion of peak flow rate control. In addition, the Response to Comments includes an action to add "eighty five percent treatment of annual runoff volume as an equivalent mitigation criteria".

Inclusion of Peak Flow Rate Control as a Treatment BMP Design Criteria

It appears that the added condition B under Section 9 is an attempt to address Ventura County's request for the inclusion of a flow-based design criteria. This added language, as well as the language in the attached tentative resolution and the Response to Comments, indicates a confusion in the difference between requirements for peak flow rate control versus a standard that allows the use of low flow-based water quality treatment control BMPs. The current language in the SUSMP sets design standards for treatment control BMPs based upon a combination of four volume-based design options AND the "control of peak flow discharge" with no consideration of a design standard for BMPs that require a flow-based design. The language in the proposed SUSMP gives the designer an apparent flexibility in their choice of BMPs. This choice is important due to the wide ranges of land development types, pollutants, sensitive groundwater basin locations and BMP treatment control effectiveness. However, the present language limits the choices to those with volume-based design criteria, i.e. detention basins, infiltration basins. With the present language an engineer wanting to utilize any flow-based BMP, i.e., swales, filters, treatment devices, would need to make assumptions on technical items such as duration, frequency, and/or flow rate, leading to variable outcomes that could not assure compliance with the criteria as written.

When we asked questions on the above issue, your staff referred us to the State of Maryland's Stormwater Design Manual (Maryland Manual). This document is comprehensive and presents an approach for sizing stormwater facilities "to meet pollutant removal goals, maintain groundwater recharge, reduce channel erosion, prevent overbank flooding and pass extreme floods". It is clear when they are dealing with the reduction of peak stormwater flow for flood control and when they are dealing with low flow pollutant removal sizing criteria. The design sizing criteria for water quality is volume-based when the options given require a volume-based design. Examples are included. Redevelopment is encouraged in order to reduce urban sprawl and although redevelopment projects are encouraged to implement BMPs, they are not required to meet the design standards and performance criteria established. This appears to allow flexibility for the use of other BMPs, including those requiring a flow-based design, on redevelopment projects. A careful review of documents like this one, that appear to be based on years of experience, may be helpful in development of appropriate criteria.

SUSMP Design Standard Options Are Not Technically Equivalent

While the most recent SUSMP does present Ventura County's volumetric methodology as an option, it sets the runoff volume standard for Los Angeles at 85% capture. We are pleased that the SUSMP now includes our methodology, but request review of the back up calculations and modification of the percent capture to reflect equivalent standards. The document, "Calculations to Determine Equivalent Percent

Volume Capture Criterion", Swamikannu 12/12/99 appears to be inadvertently based on the rainfall curves for Bishop, CA. These curves are found one page before the page in the California Stormwater Best Management Practices Handbook (State Handbook) that contains the Los Angeles Airport curves. We request that the back up documentation be reviewed and the standards be set in an equivalent manner. Reducing the percent of runoff volume captured to a number is consistent with the proposed 0.75" rainfall criteria will have minimal effect on pollutant removal.

2. The SUSMP Encourages Directly Connected Impervious Areas (DCIA)

A basic and effective site design principle for stormwater management is to minimize the amount of DCIA. In some cases, even directly connected "clean" run-off can decrease treatment efficiency as well as increase flood and erosion potential. However, the proposed SUSMP language encourages the direct connection of roof drains by allowing the exclusion of their area from the area for calculation of rainfall or runoff volume to be treated provided they connected directly to the storm drain system. This may not be appropriate in many cases and appears to be contrary to other parts of the document that encourage projects to mimic predeveloped site conditions. In the Maryland Manual, stormwater credits are allowed for innovative site planning practices, one of which is "the disconnection of rooftop runoff".

The content of the SUSMP appears to have the potential to have far-reaching effects on many communities. We urge you to take the time to work with our county and others with experience in the design, construction and maintenance of treatment control BMPs as well as all other interested parties to discuss development of appropriate standards. We look forward to working with you on this issue.

If you have any questions please call me at (805) 654-5051.

Very truly yours,

V. Musgrove

Vicki Musgrove
Manager, Stormwater Quality Section

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Ventura Countywide Stormwater Quality Management Program

Participating Agencies

Camarillo

County of Ventura

Fillmore

Moorpark

Ojai

Oxnard

Port Hueneme

San Buenaventura

Santa Paula

Simi Valley

Thousand Oaks

Ventura County Flood Control District

September 13, 1999

Mr. Xavier Swamikannu
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: **Regional Board Staff Recommendation - Notice of Public Hearing – Consideration of Standard Urban Storm Water Mitigation Plans Submitted for Approval to the Executive Officer Under the Los Angeles County Municipal Storm Water Permit**

Dear Mr. Swamikannu:

Attached is a document that describes the methodology used to develop the approach for design of both volumetric and flow-based treatment control Best Management Practices (BMPs) presented in the Ventura Countywide Stormwater Management Program's Draft Guidelines for Land Development.

This methodology has been successfully utilized in the design of BMPs on new development projects throughout Ventura County. A great deal of time and energy was put into development of these standards and it has been determined that they are comparable to those listed in the subject document.

We therefore ask that you appropriately include the following additional third option for derivation of numerical mitigation measures.
3. unit basin storage volume design based on 70% capture of annual runoff and flow based design criteria based on 10% of the peak 50-year flow rate from impervious areas calculated using standard flood control hydrology.

If you have any questions or need additional information, please call me at (805) 654-2040 or Vicki Musgrove at (805) 654-5051

Very truly yours,

Alex Sheydayi, Chair
Management Committee
Ventura Countywide Stormwater Quality Management Program

R0069460

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Stormwater Treatment
A Design Approach for
Volumetric and Flow Based
Best Management Practices

Prepared by
Camp Dresser & McKee Inc.
Jeffrey D. Endicott, P.E.
Donald J. Schroeder, P.E.
Larry A. Roesner, Ph.D., P.E.

General Theory for Volumetric Controls

Many of the pollutants carried by storm water as it flows through and out of a drainage area are associated with solid particles that are held in suspension by the turbulent motion of the water. By creating a volume of slowly moving or quiescent water, those sediments have a chance to fall out of suspension. Generally, the larger the particle, and the greater its specific gravity, the quicker it falls out of suspension. As a result of this phenomenon, simple settling in volumetric controls such as detention basins can be an effective treatment mechanism for stormwater runoff. However, for very fine particles, other factors may come into play, and even in motionless water, particles may remain suspended indefinitely. Therefore, there is a physical limit to the pollutants that can be removed by settling. Unless chemical reactions or other factors intervene, some pollutants may stay in the water no matter how long it is detained.

A second factor also affects sediment removal by settling, and is related to the sequence in which storms enter the basin. If a basin has a chance to empty completely from one storm event before the next arrives, the next event can take full advantage of the available storm volume. However, if the previous event is still partially held by the basin, the two events interfere. There are three major factors contributing to this interference. First, the effective volume of the basin available to capture water from the second event is reduced by the residual volume from the first event. Hence, an overflow (basin capacity exceeded) is more likely for the second event. Second, even if the basin does not overflow, the volume retained by the basin after the second event is larger than it would be if the residual from the first event was not present, so recovery from the second event takes longer. And, third, the constituents carried by the second event mix with those from the first event, and the result is that the detention from the second event now attempts to remove a mix of settleable material that is inherently less prone to settling.

Over all, interference between events generally reduces the effectiveness of the basin. And, the longer flows are held, the more likely it is that interference will occur. It is therefore important to attempt to size basins so that water is held long enough for adequate settling to occur, but not so long that inter event effects (interference) become large. Many factors come into play in this situation, and design variables such as compartmentalization and baffling can affect basin performance quite substantially. However, the basic principle is that a balance of factors determines removal effectiveness.

Research carried out over the last ten years or so has provided insights that make possible a number of general conclusions regarding basin sizing, and determination of maximum effectiveness. Most prominent in the literature in this area is the data and related assessments of the National Urban Runoff Program.

This program evaluated a large number of urban cases, and it was found that a clear pattern emerged in relation to settleable materials. In essence, it became clear that a range of settleability was encountered in urban runoff. At one end of the scale is a size range that relates to sands or other relatively coarse materials, which settle out of solution in a matter of minutes or hours. At the other end of the scale are clays and fine particles that take days for removal. This latter group cannot effectively be removed by settling, since water held over a period of days almost inevitably results in inter event mixing, and removal does not occur. In fact, inter event effects commonly become quite significant if basin retention is longer than 2 to 3 days, since rainfall frequency is typically of this order during stormy periods. However, holding water for less than 1 day is problematic from the standpoint of water quality improvement since for typical sizes and depths available for basins, durations of less than approximately 2 days neglect the opportunity to remove significant fractions of sediments that are quite amenable to settling.

Experience shows that calculated detention times in the range of 24 to 48 hours are likely to provide the best compromise between factors, and result in the best performance of basins that rely on unassisted (no chemical additives) settling as the primary water quality improvement mechanism. A detention time of in this range is a good choice for providing significant removal, by allowing reasonable opportunity for settling of materials that can be removed that way, without promoting the problems inherent in attempting to achieve significantly longer detention times. It must be noted that the concept of detention time is only meaningful at one particular storm event and runoff volume, while in actuality, runoff volume and patterns vary widely over all storms. For typical basins with gravity flow discharge, the average detention time is a function of basin surface area and depth, and configuration of the discharge pipe or spillway. Therefore, basin design parameters must include total basin volume and drawndown time at a full basin. By using a 40-hour drawdown time when the basin is full, the average detention time over all storms is likely to be closer to 24 hours. The California BMP Handbook (Municipal) describes a rational approach for basin sizing and drawdown.

Origin of California BMP Handbook (Municipal) Criteria for Volumetric Controls

The California BMP Handbook (Municipal) criteria were developed as follows. Based on a review of the general climatology of the state with respect to mean annual rainfall and topography, fifteen rain gages with long term hourly rainfall records were selected by the project team hydrologists as being representative of various regions in the state. A comparative analysis of the rainfall data at these stations revealed that of the 15 stations analyzed, the rainfall statistics of six of the stations were similar to another station in the set of 15, so those areas were grouped into the same climatic zone, resulting in nine general hydrologic/topographic zones for the state. These are shown and described in Appendix D of the California BMP Handbook (Municipal), and are attached for reference. For each of the nine rain gages, long term simulations of runoff were examined using the U.S. Army Corps of Engineers' Storage, Treatment Overflow Runoff Model (STORM). STORM is a hydrologic model that translates a time series of hourly rainfall data into a time series of runoff, then routes the runoff through detention storage. The model results were then plotted as annual percent runoff capture versus unit basin storage volume. These are shown in Appendix D of the California BMP Handbook (Municipal), and are attached for reference. The assumptions used in the STORM modeling for this effort include a 40-hour drawdown time, initial abstraction/depression storage of 0.06 inches, and a runoff coefficient of 0.9 for impervious surfaces and 0.15 for pervious surfaces.

It is worthwhile to note that at the time the California BMP Handbook (Municipal) was prepared, a series of STORM runs were also made for the same conditions and stations noted above, but using a 24 hour rather than a 40 hour drawdown. The resultant reduction in required basin volume ranged from only 10 to 20 percent.

Using the California BMP Handbook (Municipal) approach to determine required basin size for a particular application, one enters an Appendix D curve for the hydrologic zone that the project lies within with the percent imperviousness of the area that drains to the basin and the required percent capture of the annual runoff. The required percent capture of the annual runoff is usually set at the "knee of the curve." The knee of the curve represents the point beyond which the incremental capture of runoff diminishes relative to the incremental increase in required basin volume and, therefore, basin cost. In other words, the incremental cost increase in the basin would begin to greatly outweigh the incremental increase in pollution control benefits.

It is important to note that ultimate pollutant removal effectiveness is not highly sensitive to selection of the percent annual capture. For example, a study in Denver showed that when the annual runoff volume captured increased from 75%, to 85%, and to 94%, the average annual total suspended sediments removed increased from 86%, to 88%, and to 90% respectively, a mere 4% gain in pollutant removal for a 20% increase in annual runoff volume captured (Urbonas *et al.*, 1990). This suggests that the "knee of the curve" is a good starting point for discussion of a volumetric design standard, but that politically, socially, and environmentally responsible standards 5 to 10 percent below the "knee of the curve" may emerge during a thorough maximum extent practicable (MEP) analysis conducted at the community level. Furthermore, refinement of the California BMP Handbooks (Municipal) approach can be accomplished at the community level by redoing the analysis using local rainfall statistics and hydrologic parameters established by responsible local authorities such as flood control agencies; however, this is not expected to yield significant differences from the results set forth in the California BMP Handbooks (Municipal).

General Theory for Flow-Based Controls

Flow-based controls are another option for removing many of the same pollutants removed through the volumetric controls discussed above. Flow-based controls include biofilters such as vegetated swales and filter strips, as well as media filters. These controls remove pollutants through filtering primarily, but also through some limited settling. Because the removal mechanism, filtering, is fundamentally different than settling, a different design approach is needed for these controls.

Historical hourly and 15 minute incremental rainfall records can be analyzed and separated into storm events using a model such as the U.S. Department of Transportation, Federal Highway Administration's Synoptic Rainfall Analysis Program (SYNOP). Once separated, the relative frequency of storms of various magnitudes can be plotted. The precipitation plot for LAX is included for reference. A review of the LAX plot (and similar plots throughout the West) shows that the overwhelming majority of all storms are relatively small. For example, the estimated 1 year, 24 hour rainfall event in Los Angeles is estimated at 1.8 inches, which is larger than approximately 95% of all storms in the basin.

The runoff that results from these small storms can calculated using standard hydrologic practices, accumulated, and then plotted versus event size. The accumulated runoff plot for LAX is included for reference. A review of the LAX plot (and similar plots throughout the West) shows that a large number of storms are too small to produce any runoff, that the group of frequent small storms produce a large accumulation of runoff, and that the large "flood event" type storms produce only a fraction of the total runoff. For LAX, this curve shows that the accumulated runoff from all storms up to the previously noted 1.8 inch rainfall (1-year,-24 hour event) produces approximately 90% of all runoff produced by the drainage area.

Suggested Flow-Based BMP Design Criteria

The rainfall-runoff phenomenon described above suggests that flow-based controls designed to treat the flow from small storms will result in treatment of a substantial majority of all runoff from a particular drainage area. Because drainage area characteristics and the intensity and duration of rainfall have substantial impact on the rate of runoff from a given storm, a design criteria for flow-based controls must be expressed in terms of an associated return period and event duration. It is suggested that event duration be that which will result in the peak rate of runoff from a storm of given intensity, and is equal to the time of concentration of the subject drainage area. It is suggested that the event return period be set such that the runoff treated will be similar to or greater than the unit basin volume for 100% impervious area at the target percent capture rate, which will typically be on the order of a 6 month or 1 year storm.

Unfortunately, rainfall intensity and duration information is not widely published for the small, frequent storms of importance to stormwater quality design. A practical alternative approach would be to use 10% (for impervious areas) of the peak 50 year flow calculated using standard flood control hydrology. This suggested design standard and multiplier can be refined through a thorough input from local flood control and hydrology authorities and a maximum extent practicable (MEP) analysis conducted at the community level.

GENERAL ZONES WITHIN CALIFORNIA FOR SELECTING DETENTION/INFILTRATION SIZING CURVES

ZONE	AREA	GAGE
1	Inland Empire: Western San Diego, Riverside, San Bernardino Counties	Riverside City Experimental Station (#7473)
2	Mojave Desert: Eastern San Diego, Riverside, San Bernardino, Los Angeles, Kern Counties	Thermal Airport - Federal Aviation Administration (#8892) and Fire Station 39 (#8893)
3	Southern Coastal: Los Angeles, Orange, Ventura Counties	Los Angeles International Airport - Weather Service Office (#5114)
4	Central and Northern Coastal: Santa Barbara, San Luis Obispo, Monterey, Santa Cruz, Santa Clara, San Mateo, San Francisco, Alameda, Contra Costa, Western Solano, Napa, Marin, Sonoma, Mendocino, Trinity and Humboldt Counties	Oakland Airport - Weather Service Office (#6335)
5	Southern Central Valley: Kern County	Bakersfield Airport - Weather Service Office (#442)
6	Mid-Central Valley: Kings, Western Fresno, Western Tulare, Western Madera, Merced, and Mariposa Counties	Fresno Airport - Weather Service Office (#3257)
7	North Central Valley: Stanislaus, San Joaquin, Sacramento, Eastern Solano, Yolo, Colusa, Lake, Glenn, Tehama, Butte, Western Nevada, and Yuba Counties	Sacramento - Weather Service Office (#7633)
8	Owens Valley: Mono and Inyo Counties	Bishop Airport - Weather Service Office (#822)
9	Sierra: Del Norte, Siskiyou, Modoc, Shasta, Lassen, Plumas, Sierra, Eastern Nevada, Placer, El Dorado, Amador, Calaveras, Tuolume, Mariposa, Eastern Madera, Eastern Fresno, and Eastern Tulare Counties	Truckee (#9043)

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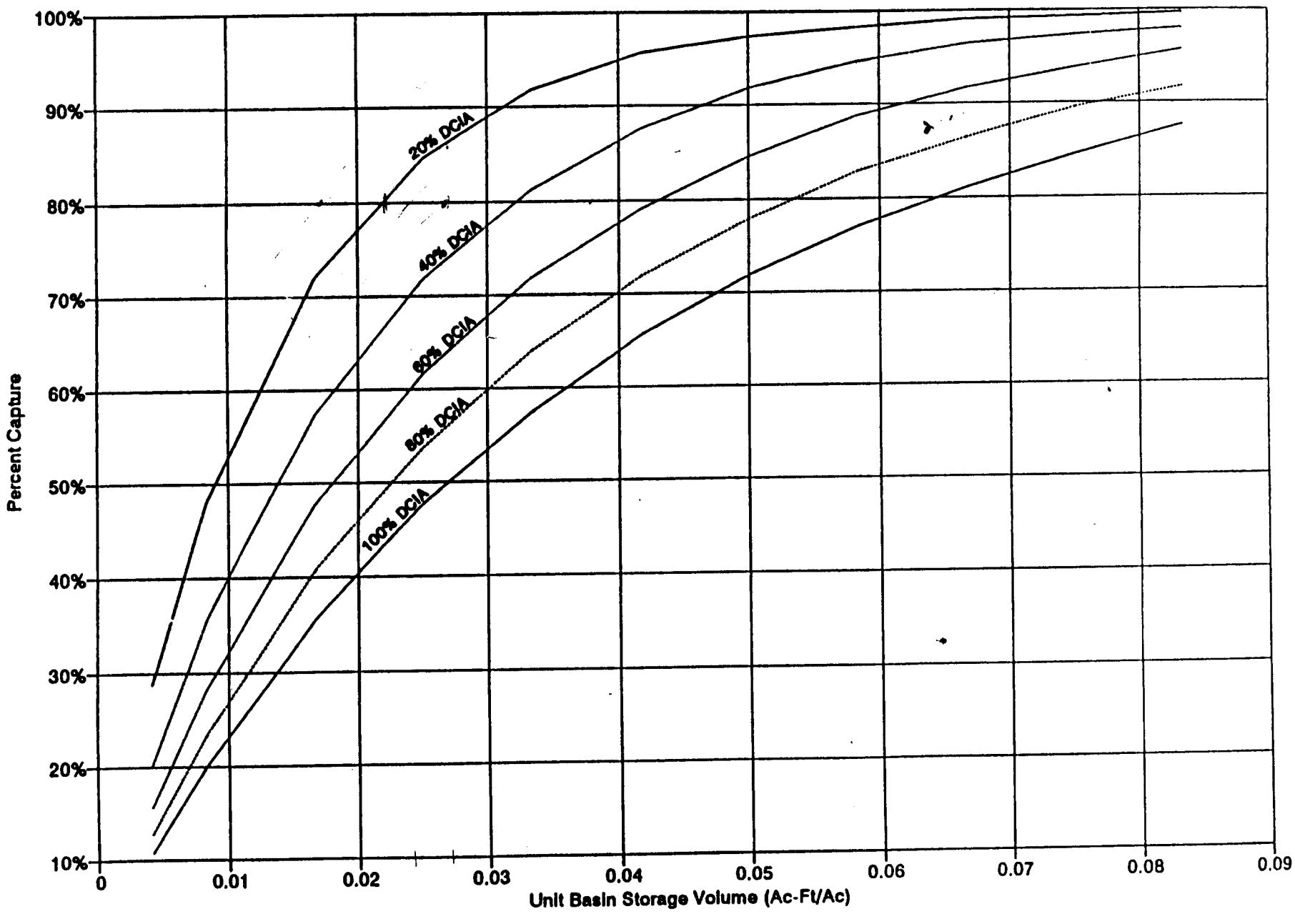
FIGURE D1. LOCATIONS OF RAIN GAGES USED FOR SIZING DETENTION/ INFILTRATION BASINS

R0069466


Los Angeles Int'l Airport
40 Hour Detention Storage Analysis
Percent Capture
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Unit Basin Storage Volume (Ac-Ft/Ac)

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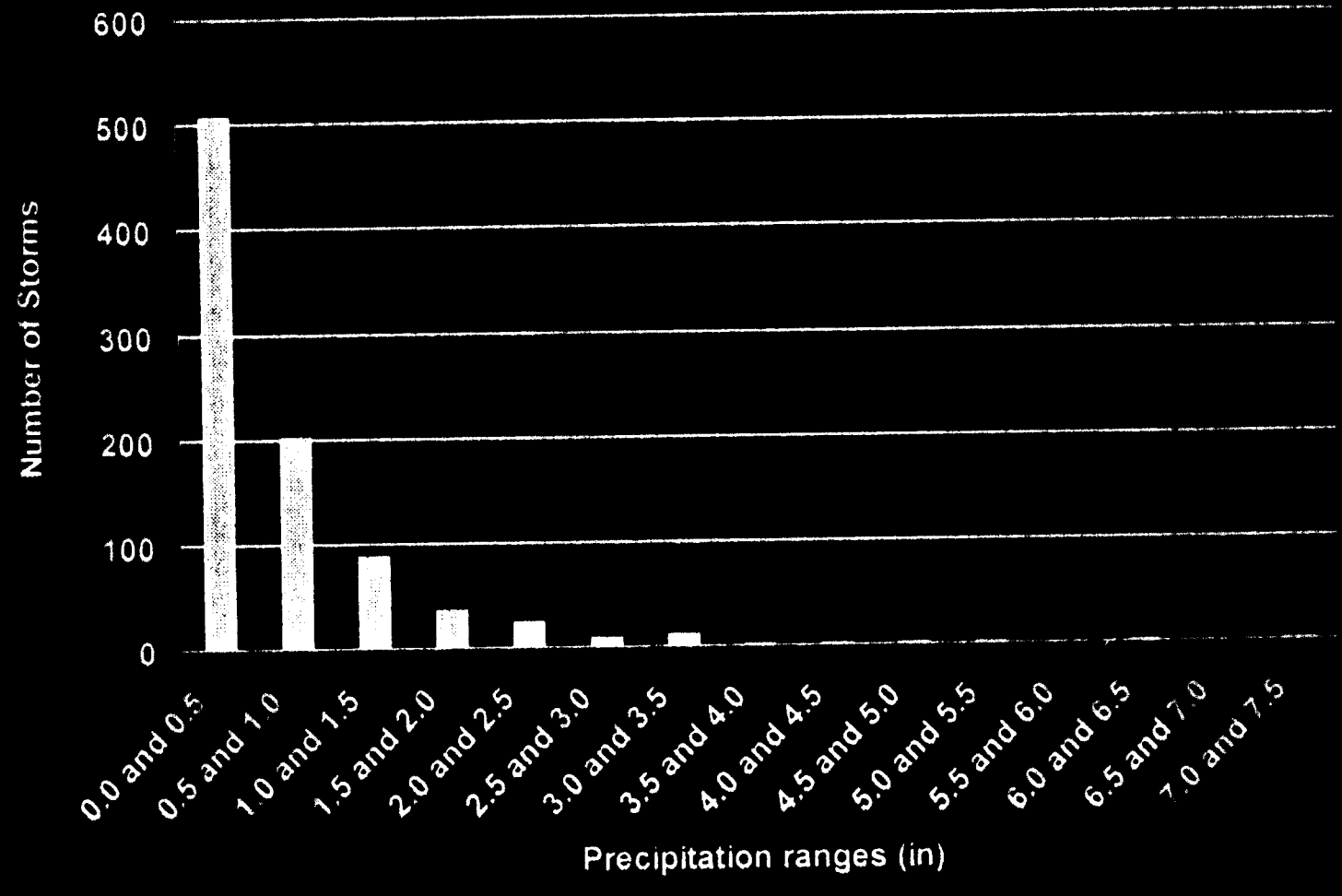
Number and Sizes of Events

(LAX: 50 -year record)



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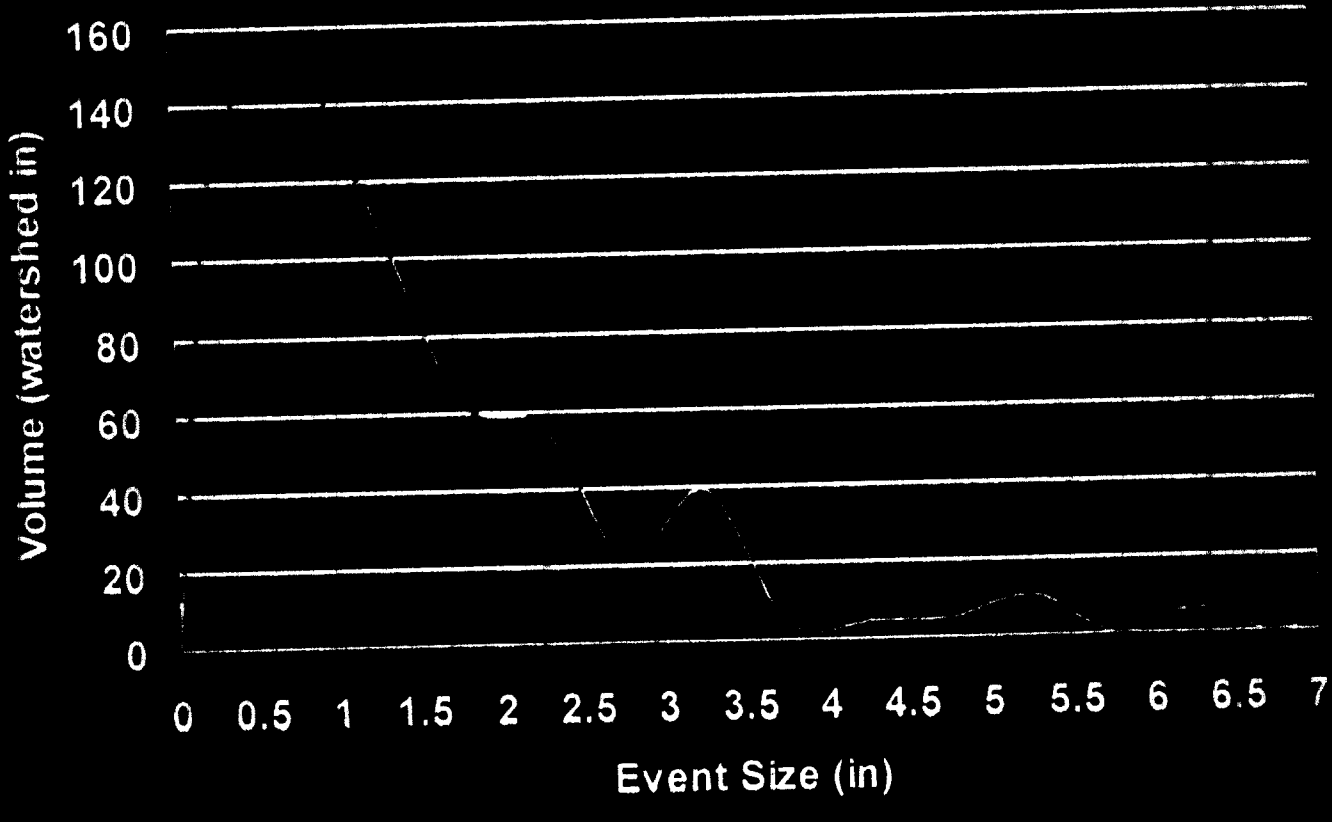
Approximate Runoff Volume vs. Event Size
(LAX: 50 -year record)



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AMERICAN OCEANS CAMPAIGN

September 8, 1999

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Stormwater Mitigation Plans

Dear Mr. Dickerson:

On behalf of the members and Board of Directors of American Oceans Campaign, I submit the following brief comments on the Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted for approval under the Los Angeles County Municipal Stormwater Permit (96-054). This topic will be considered as Agenda Item #14 at the September 16, 1999 meeting of the Los Angeles Regional Water Quality Control Board.

Include a Numerical Mitigation Measure in the SUSMPs.

As currently drafted, the SUSMPs fail to include specific numerical mitigation measures for stormwater. Many of the SUSMPs fail to include even a narrative mitigation measure. Numerically based performance measures are needed to implement an effective stormwater management program that will gain the support of the public. Standard Urban Stormwater Mitigation Plans with measures would assist permittees in selecting appropriate Best Management Practices for managing stormwater and would provide enforcement agencies and members of the public with the benefit of clearer, enforceable standards.

As a minimally acceptable standard, American Oceans Campaign supports the Regional Board staff recommendation to include a numerical mitigation measure for each SUSMP. The staff recommendation for a numerical mitigation measure is to be determined by either:

a. the 85th percentile, 24-hour runoff event determined as the maximized capture stormwater volume for the area, or
b. a historical-record based reference 24-hour rainfall criterion (.75 inch for the Los Angeles County area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

Along with other environmental groups, we believe that the numerical mitigation measure which is derived should be applied within the boundaries of the cities as well as unincorporated areas in Los Angeles County.

R0069470

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[illegible] of the nation's
oce[illegible] and coastal areas.

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Protect Environmentally Sensitive Areas.

The SUSMPs should follow the precedent established by the recently approved permit for Long Beach City and provide additional protections for environmentally sensitive areas. There are certain areas where the impacts of stormwater have an exceptionally detrimental impact on water quality, habitat, or ecological conditions. These sensitive areas should receive additional protections from the impacts of development and polluted urban stormwater. We agree with other environmental groups that a buffer zone of at least 100 feet should be imposed between any development and an environmentally sensitive area.

Thank you for considering these comments. I look forward to the September 16th meeting where these and other concerns can be raised.

Sincerely,

Ted Morton
California Policy Director

R0069471

Ballona Wetlands Foundation

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Playa Vista

Executive Director
Cindy Rains

January 12, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. Brought to this point by extensive development with a complete disregard for the quality and quantity of runoff generated, today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

On January 6, 2000, you and the Board have the opportunity to change our course toward worsening water pollution by adopting the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to a three quarter-inch storm. The Los Angeles Region already suffers from some of the worst water quality in the nation. Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

R0069472

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Ballona Wetlands Foundation

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Secretary/Treasurer
Adi Liberman
Los Angeles City
Councilmember
Ruth Galanter

Catherine Tyrrell
Environmental
Affairs Director
Playa Vista

Executive Director
Wendy Rains

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Wendy Rains
Executive Director

R0069473

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(310) 574-0700 Fax: (310) 574-9434 bwf@ballona-wetlands.org

♻



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Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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R0069474

businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Denise Washko
Director

California Native Plant Society

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Copy

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our

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regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Halli Mason, Vice President
Los Angeles-Santa Monica Mountains Chapter
California Native Plant Society

R0069477



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Web: www.cmc-ocean.org

January 19, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: January 26, 2000 Board Meeting, Agenda Item # 11: Support for Three Quarter - Inch Standard to Reduce Runoff from New Development and Redevelopment

Dear Mr. Dickerson:

On behalf of our 15,000 California members, the Center for Marine Conservation welcomes this opportunity to comment on the proposed Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted to the Executive Officer pursuant to the requirements of the Los Angeles County Municipal Stormwater Permit, Order No. 96-054. CMC urges you to adopt a Standard Urban Stormwater Mitigation Plan for the Los Angeles County municipalities that requires mitigation by specified new and redevelopment projects of 100% of the runoff generated by the first three quarters of an inch of rain, with no exceptions. By adopting this standard, the Regional Board will have the opportunity to alter significantly our current course towards worsening water pollution.

The majority of rainfall in the area is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and few measurable requirements in the municipal storm water permits, Los Angeles County's beaches are frequently unsafe for swimming; and its creeks and streams pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to begin to solve the runoff problem. Second, controlling urban runoff benefits the regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, and these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does the tourist business. With billions of dollars at stake, the health of our entire regional economy is impacted. The standard

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also will help the $10 billion statewide coastal tourism economy in that it will serve as a model to be adopted by other coastal Regional Boards.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard can make a major difference in the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, we urge you to adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new development and redevelopment.

Sincerely,

Linda Sheehan
Pollution Programs Director
lsheehan@cacmc.org

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HYE YEONG KWON
ASSISTANT DIRECTOR

January 11, 2000

Dennis Dickerson
Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Support for the 3/4 inch standard to reduce runoff from new and redevelopment

Dear Mr. Dickerson:

I recently have had the chance to review the standard urban stormwater mitigation plan for Los Angeles County and Cities in Los Angeles County. Treatment of the stormwater quality is an essential element for protecting local watersheds, and is widely used by many municipalities around the country. I strongly support the three-quarter inch runoff treatment standard based on past scientific research on the performance of stormwater best management practices. I have also enclosed a recent article on stormwater strategies for arid and semi-arid watersheds that may be helpful in adapting effective stormwater practices for your region.

Thank you for the opportunity to comment on the proposed stormwater mitigation plan. Adoption of the three quarter inch standard will help to protect the creeks and coastlines of Los Angeles from the impacts of stormwater pollutants, and represents a fair, equitable and achievable threshold for stormwater treatment.

Sincerely,

Thomas R. Schueler

Thomas R. Schueler
Executive Director

cc Mark Gold

attachment

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'll. Stormwater Strategies for Arid and Semi-Arid Watersheds

Water supply and flood control have traditionally dominated watershed planning in arid and semi-arid climates. Until recent years, stormwater quality has simply not been much of a priority for water resource managers in the west. This situation is changing rapidly, as fast growing communities are responding to both emerging water quality problems and new federal regulations. In particular, larger cities in the west have gradually been dealing with stormwater quality to meet the requirements of the first phase of EPA's municipal stormwater NPDES program. Soon, thousands more smaller communities will need to develop stormwater quality programs when the second phase of this national stormwater regulatory program is rolled out later this year.

At first glance, it seems ludicrous to consider managing the quality of stormwater in arid regions where storms are such a rare and generally welcome event—sort of like selling combs at a bald convention. The urban water resources of the southwest, however, are strongly influenced by stormwater runoff and by the watershed development that increases it. Indeed, the flow of many urban streams in the southwest is generated almost entirely by human activity: by urban storm flow, irrigation return flow and wastewater effluent. Thus, the quality of both surface water and groundwater in urbanizing areas of arid and semi-arid regions of the southwest is strongly shaped by urbanization.

For purposes of this article, arid watersheds are defined as those that receive less than 15 inches of rain each year. Semi-arid watersheds get between 15 and 35 inches of rainfall, and have a distinct dry season where evaporation greatly exceeds rainfall. In contrast, humid watersheds are defined as those that get at least 35 inches of rain each year, and often much more. There are many arid and semi-arid watersheds, most of which are located in fast growing regions of the western United States (Figure 1). Low annual rainfall, extensive droughts, high intensity storms and high evaporation rates are characteristic of these watersheds, and present many challenges to the stormwater manager. [Note: in some arid and semi-arid watersheds, most precipitation falls as snow and evaporation rates are much lower. These watersheds are found in portions of Alaska and at higher elevations of the Rocky Mountains and Sierra Nevada. Guidance on stormwater strategies for these dry but cold watersheds can be found in Caraco (1997)].

This article reviews strategies for managing stormwater in regions of scarce water based on an extensive survey of 30 stormwater managers from arid and semi-arid regions. Next, the article explores how source control, better site design and stormwater practices can be adapted to meet the demanding conditions posed by arid and semi-arid climates. It begins by examining the environmental factors that make stormwater management in arid and semi-arid watersheds so unique and challenging. As a consequence, stormwater strategies for the west are often fundamentally different from those originally developed for more humid regions. Some of the fundamental differences are outlined in Table 1 and are described in detail in the following text.

Soon, thousands more smaller communities will need to develop stormwater quality programs.

Figure 1. Regions of the Continental United States With Less Than 15" of Precipitation Annually

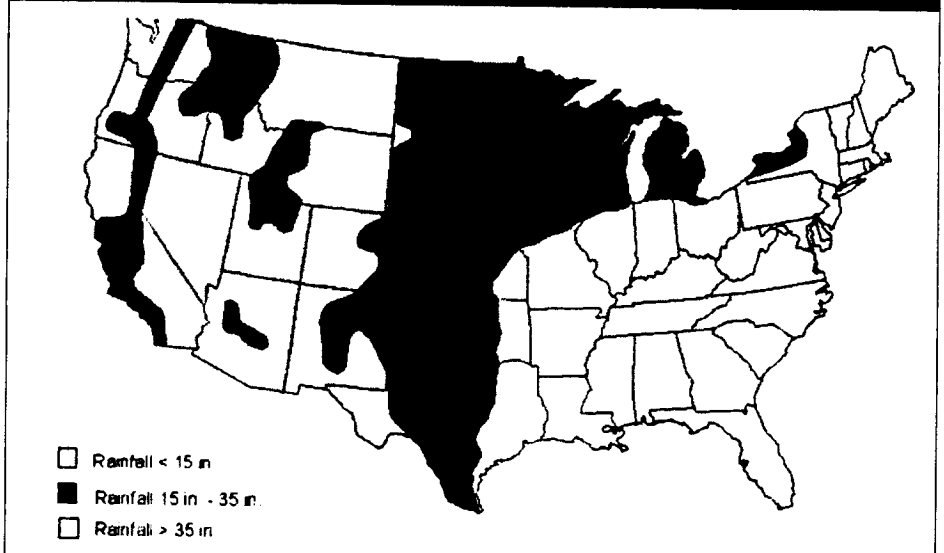

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Table 1. The West Is Different: Key Considerations in Arid and Semi-Arid Watersheds
Aquatic resources and management objectives are fundamentally different
Rainfall depths are much lower
Evaporation rates are much higher
Pollutant concentrations in stormwater are much greater
Vegetative cover is sparse in the watershed
Sediment movement is great
Dry weather flow is rare, unless return flows are present

Aquatic resources and management objectives are fundamentally different

The rivers of arid regions are dramatically different from their humid counterparts. Some idea of these differences can be seen by comparing the dynamics of an arid river to a humid one (see Box 1). The differences are even more profound for the smaller urban streams in arid watersheds. In fact, it is probably appropriate to refer to them as gullies or arroyos rather than streams, since they rarely have a perennial flow of water. Many of the physical, chemical and biological indicators used to define stream quality in humid watersheds simply do not apply to the ephemeral washes and arroyos that comprise the bulk of the drainage network of arid watersheds. Without such indicators, it is difficult to define the qualities that merit protection in ephemeral streams. Clearly, the goals and purposes of stream protection need to be reinterpreted for ephemeral stream channels, and cannot be imported from humid regions.

In humid watersheds, the first objective of stormwater management is the protection of perennial streams, with goals such as maintaining pre-development flow rates, habitat conditions, water quality and biological diversity. In contrast, the objectives for stormwater management in most arid watersheds are ultimately driven either by flood control or the quality of a distant receiving water, such as a reservoir, estuary, ocean, or an underground aquifer. Witness some of the recent water quality problems in arid and semi-arid watersheds for which stormwater is suspected to be primarily responsible: beach closures along the Southern California coast, trash and floatables washed into marinas in Santa Monica, nutrient enrichment in recreational reservoirs like Cherry Creek Reservoir in Denver and Town Lake in Austin, trace metals violations in the estuarine waters of San Francisco Bay, or concerns about the quality and quantity of groundwater recharge in aquifers of San Antonio and Austin. Usually, the only local concern is preventing the loss of capacity of irrigation channels or storage reservoirs caused by sedimentation.

Groundwater is a particularly valued water resource in arid and semi-arid watersheds. Many fast-growing western communities are highly reliant on

Box 1 **An Arid River Runs Through It**

Consider, for a moment, the characteristics of the South Platte River as it runs through Denver, Colorado, as chronicled by Harris et al (1996). Flow in the South Platte river is extremely variable with a few thunderstorms and the spring snow melt causing a half dozen dramatic peaks in discharge. Normally, however, river flows quite low, falling below the average daily flow level some 354 days a year. Much of the flow in the South Platte has been spoken for: it has been estimated that river water is used and returned back to the river from three to seven times before it leaves the state (primarily due to upstream water appropriations for irrigation). Most of the time, the river's flow is sustained by municipal wastewater effluent flows, which contribute about 90% of the river's daily flow during most of the year. Indeed, without wastewater and irrigation flows, the river would frequently run dry (as it had prior to settlement). The river continues to strongly interact with groundwater, and much of the flow moves underground. The South Platte is very warm, with summer surface water temperatures exceeding 30 degrees Celsius (and fluctuating by as much as 15 degrees each day).

From a water quality standpoint, the South Platte frequently suffers from oxygen depletion, and has high concentrations of dissolved salts and nitrogen. Prior to settlement, the South Platte River was not believed to have riparian forest corridors, but in recent years, introduced species have become well established along many parts of the river. The quality of river habitat is generally regarded as poor, due to low flows, sandy, shifting substrates, and a lack of channel structure and woody debris. The river's channel continually changes in response to extreme variations in both flow and sediment supply. These extremely variable conditions are not conducive to a diverse aquatic habitat for aquatic insects or fish. For example, fewer than a dozen fish species inhabit the South Platte River, as compared to 30 or more that might be found in a humid region.

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Table 2. Rainfall Statistics for Eight U.S. Cities (all units in inches)
Sources: NOAA, 1997; US DOC, 1975, CWP 1999

City	Rainfall Statistics					
	Annual Rainfall	Days of Rain per Year	90% Rainfall Event	Annual Evaporation Rate	Two Year, 24 Hour Storm	Ten Year, 24 Hour Storm
Washington, DC	38	67	1.2	48	3.2	5.2
Dallas, TX	35	32	1.1	66	4.0	6.5
Austin, TX	33	49	1.4	80	4.1	7.5
Denver, CO	15	37	0.7	60	1.2	2.5
Los Angeles, CA	12	22	1.3	60	2.5	4.0
Boise, ID	11	48	0.5	53	1.2	1.8
Phoenix, AZ	7.7	29	0.8	82	1.4	2.4
Las Vegas, NV	4	10	0.7	120	1.0	2.0

groundwater resources, and it is becoming a limiting factor for some. On a national basis, groundwater provides 39% of the public water supply. In the arid and semi-arid southwest, however, groundwater sources comprise 55% of the water supply (Maddock and Hines, 1995). Consequently, these communities have a strong interest in both the recharge and protection of groundwater on which they depend.

Rainfall Depths Are Much Smaller

Table 2 compares a series of rainfall statistics for eight arid, semi-arid and humid cities and documents that it rarely rains in arid watersheds. For example, in the fast growing Las Vegas, Nevada region, rainfalls greater than a tenth of an inch occur, on average, less than ten days a year. Not only does rain seldom fall, not much falls when it does. For example, 90% of all rainfall events in a given year are usually less than 0.50 to 0.80 inches in arid watersheds, compared to 1.0 to 1.5 inches in humid watersheds. If a "90% rule" was used in many arid regions, the water quality storm would be roughly half that of most semi-arid and humid watersheds, which would greatly reduce the size, land consumption and cost of structural practices that need to be built. In many cases, the entire water quality storm could be disposed of on-site through better site design, without the need for structural practices. It should be noted that there are some significant exceptions to this rule. Los Angeles, for example, experiences higher rainfall depths due to intense coastal storms in the winter, especially in el Nino years.

While intense storms cause the flash flooding that is so characteristic of the west, it is also important to keep in mind that the depth of rainfall in these storms is smaller than that of semi-arid and humid watersheds (Table 2). For example, the rainfall depth associated with the two-year 24-hour storm in most arid watersheds ranges from 1.0 to 1.4 inches, which is roughly equal to the typical water quality storm for a humid watershed. Similarly, the rainfall depth for the ten-year 24-hour storm in most arid watersheds ranges from two to three inches, which is roughly equivalent to the depth of a two-year storm in a semi-arid or humid watershed. Consequently, stormwater managers in arid regions can fully treat the quality and quantity of stormwater with about a third to a half of the storage needed in humid or semi-arid watersheds, with all other factors being equal.

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events. For example, Guay (1996) examined how development had changed the frequency of floods in arid watersheds around Riverside, California. Over two decades, impervious cover increased from 9% to 22% in these fast-growing watersheds. As a direct result, Guay determined that peak flow rate at gauged stations for the two-year storm event had climbed by more than 100%, and that the average annual stormwater runoff volume had climbed by 115% to 130% over the same time span.

Watershed development can greatly increase peak discharge rates during rare flood events.

Evaporation Rates are Greater

High evaporation rates are a great challenge in arid and semi-arid watersheds. Low rainfall combined

with high evaporation usually means that stored water will be lost water. In Las Vegas, for example, annual rainfall is a scant four inches, while pan evaporation exceeds ten feet (See Table 2). Consequently, it is virtually impossible to maintain a pond or wetland in an arid watershed without a supplemental source of water (see Saunders and Gilroy, 1997; *Technical Note* 111). Evaporation also greatly exceeds rainfall for many months of the year in semi-arid watersheds, and requires special pond design techniques.

As streams urbanize, dry weather flow can actually increase.

Pollutant Concentrations in Stormwater Are Often Higher

The pollutant concentration of stormwater runoff from arid watersheds tends to be higher than that of humid watersheds. This is evident in Table 3, which compares event mean concentrations (EMCs) from five arid or semi-arid cities to the national average for several common stormwater pollutants. As can be seen, the concentration of suspended sediment, phosphorus, nitrogen, carbon and trace metals in stormwater runoff from arid and semi-arid watersheds consistently exceeds the national average, which is heavily biased toward humid watersheds. In addition, bacteria levels are often an order of magnitude higher in arid regions (Chang, 1999).

The higher pollutant concentrations in arid watersheds can be explained by several factors. First, since rain events are so rare, pollutants have more time to build up on impervious surfaces compared to humid regions. Second, pervious areas produce high sediment and organic carbon concentrations because the sparse vegetative cover does little to prevent soil erosion in uplands and along channels when it does rain. The strong effect of upland and channel erosion can be detected when stormwater samples are taken from channels, but are less pronounced in stormwater outfall pipes.

Vegetative Cover is Sparse in the Watershed

Native vegetative cover is relatively sparse in arid and semi-arid watersheds, and offers little protection against soil erosion. Irrigation is required to establish dense and vigorous cover, which may not be sensible or economical given scarce water resources. In addition, high flows released from storm drains frequently accelerate downstream erosion since channels are also sparsely vegetated. Finally, many stormwater practices require dense vegetative cover to perform properly (e.g., grass swales are often not practical in arid watersheds, given the difficulty to establish and maintain turf).

Sediment Movement Is Greater

Stream channels in arid and semi-arid watersheds move a lot of sediment when they flow. For example, Trimble (1997) found that stream channel erosion supplied more than two thirds of the annual sediment yield of an urban San Diego Creek. He concluded that the higher flows due to watershed urbanization had greatly accelerated the erosion of arroyos, over and above the increases caused by grazing, climate and riparian management. Channel erosion can be particularly severe along road ditches that experience higher stormwater flows, which not only increases sediment erosion but also creates chronic ditch maintenance problems.

Dry Weather Flows Are Rare, Unless Supplemented by Return Water

Most small streams in arid watersheds are gullies or arroyos that only flow during and shortly after infrequent storm events. As streams urbanize, however, dry weather flow can actually increase. Human sources of dry weather flow include return flows from lawn and landscape watering, car washing, and surface discharges of treated wastewater. For example,



Figure 2: Arial Photograph from Boise, Idaho

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Mizell and French (1995) found that excess water from residential and commercial landscape irrigation and construction site dewatering greatly increased rate and duration of dry weather flow in a Las Vegas Creek, and was sufficiently reliable to be the primary irrigation source for a downstream golf course.

Stormwater Strategies for Arid and Semi-Arid Watersheds

Watershed managers need to carefully choose stormwater practices that can meet the demanding climatic conditions and water resource objectives of arid and semi-arid watersheds. Communities can employ three broad strategies: aggressive source control, better site design, and application of "western" stormwater practices. Some of the key trends in each of these areas are described below.

Aggressive Source Control

The term "source control" encompasses a series of practices to prevent pollutants from getting into the storm drain system in the first place. The practices include pollution prevention, street sweeping, and more frequent clean outs of storm drain inlets. Each practice acts to reduce the accumulation of pollutants on impervious surfaces or within the storm drain system during dry weather, thereby reducing the supply of pollutants available for wash off when it rains.

Pollution prevention. Pollution prevention seeks to change behaviors at residential, commercial and industrial sites to reduce exposure of pollutants to rainfall. Almost all arid stormwater managers considered pollution prevention measures to be an integral element of their stormwater management program, on par with the use of structural stormwater practices (Caraco, 1997). Indeed, many western communities have pioneered innovative pollution prevention programs (see *On Watershed Education*, this issue). These programs focus on educating homeowners and businesses on how they can reduce or prevent pollutants from entering the storm drain system when it's not raining.

In recent years, western communities have been targeting their educational message to more specific groups and populations (see *On Watershed Education*, this issue). For example, Los Angeles County has identified seven priority categories for intensive employee training in industrial pollution prevention — auto scrap yards, auto repair, metal fabrication, motor freight, chemical manufacturing, car dealers, and gas stations— on the basis of their hotspot potential and their numerical dominance (Swammikannu, 1998). In the Santa Clara Valley of California, the three key priorities for intensive commercial pollution prevention training are car repair, construction, and landscaping services. Targeting is also used to reach homeowners with specific water conservation, car washing, fertilization and pesticide messages (see *On Watershed Education*).

Street sweeping. Street sweeping seeks to remove the buildup of pollutants that have been deposited along the street or curb, using vacuum assisted sweeper trucks. The pollutant removal performance of a new generation of street sweeper was recently reviewed in *Technical Note* 103. While researchers continue to debate whether street sweepers can achieve optimal performance under real-world street conditions, most concede that street sweeping should be more effective in areas that have distinct wet and dry seasons (CDM, 1993), which is a defining characteristic of arid and semi-arid watersheds.

Better site design presents a great opportunity to minimize impervious cover and stormwater impacts in the west.

Storm drain inlet clean outs. One of the last lines of defense to prevent pollutants from entering the storm drain system is to catch them in the storm drain inlet. Mineart and Singh (1994) reported that monthly or even quarterly clean outs of sediment in storm drain inlets could reduce stormwater pollutant loads to the San Francisco Bay by 5% to 10%. Currently, few communities clean out their storm drain inlets more than once a year, but a more aggressive effort by public works to clean out storm drains prior to the onset of the wet season could be a viable strategy in some communities.

Better Site Design

Better site design clearly presents great opportunities to reduce impervious cover and stormwater impacts in the west, but has not been widely implemented to date. Indeed, the "California" development style, with its wide streets, massive driveways, and huge cul-de-sacs has been copied in many western communities and arguably produces more impervious cover per home or business than any other part of the country (Figure 2). While the popularity of the California development style reflects the importance of the car in shaping communities, it is also a strong reaction against the arid and semi-arid landscape. The brown landscape is not green or pastoral, and many residents consider concrete and turf to be a more pleasing and functional land cover than the dirt and shrubs they replace.

While the techniques and benefits of better site design have been extensively profiled in the last issue of *Techniques* (3:2), it is worth discussing how these techniques can be adapted for western developments.

A key adaptation is to incorporate the concept of "stormwater harvesting" into residential and commercial development design (COT, 1996). Water harvesting is an ancient concept that involves capturing runoff from rooftops and other impervious surfaces and using it for drinking water or to irrigate plants (e.g., the cistern). In a more modern version, rooftop runoff is spread over landscaping areas or the yard, with the goal for complete disposal of runoff on the property for storm events up to the two-year storm (which ranges from one to two inches in most arid and semi-arid climates. For example, the City of Tucson recommends 55 gallons of storage per 300 to 600 square feet of rooftop for residential bioretention areas (COT, 1996). In higher density settings, it may be more practical to store water in a rain barrel or cistern for irrigation use during dry periods.

When water harvesting is aggressively pursued, stormwater runoff is produced only from the impervious surfaces that are directly connected to the roadway system. Denver has utilized a similar strategy program to disconnect impervious areas and reduce the amount of stormwater pollution (DUDFC, 1992). A useful guide on these techniques has also been produced for the San Francisco Bay area (BASMAA, 1997). Water harvesting may also prove to be a useful stormwater retrofitting strategy, particularly in regions where water conservation is also a high priority.

Better site design principles also need to be adapted for fire safety in Western communities adjacent to chaparral vegetation that are prone to periodic wildfires. In some case, vegetation setbacks must be increased in these habitats to protect developments from dangerous wildfires (CWP, 1998).

Developing Western Stormwater Practices

Given the many challenges and constraints that arid and semi-arid watersheds impose, managers need to adapt and modify stormwater practices that were originally developed in humid watersheds. In our stormwater managers survey, four recurring principles emerged on how to design "western" stormwater practices that are suited to the challenging climate and water resource problems of arid and semi-arid watersheds:

1. Carefully select and adapt stormwater practices for arid watersheds
2. Minimize irrigation needs for stormwater practices
3. Protect groundwater resources and encourage recharge

Table 3. Stormwater Pollutant Event Mean Concentrations in Arid and Semi-Arid Regions (Units: mg/l, except for metals which are in ug/l)

Pollutant	National	Phoenix, AZ	Boise, Idaho	Denver, Colorado	San Jose, California	Dallas, Texas
Source	(1)	(2)	(3)	(4)	(5)	(6)
Rainfall		7.1 inches	12 inches	13 inches	14 inches	28 inches
N	2-3000	40	15	35	67	32
TSS	78.4	227	116 *	384	258	663
BOD	14.1	109	89	nd	12.3	12
COD	52.8	239	261	227	nd	106
Total N	2.39	3.26	4.13	4.80	nd	2.70
Total P	0.32	0.41	0.75	0.80	0.83 #	0.78
Soluble P	0.13	0.17	0.47	nd	nd	nd
Copper	14	47	34	60	58	40
Lead	68	72	46	250	105	330
Zinc	162	204	342	350	500	540

References: (1): Smullen and Cave, 1998, (2) Lopes et al, 1995 (3) Kjelstrom, 1995 (computed) (4) DRCOG, 1983, (5) WCC, 1992 (computed) (6) Brush et al, 1995.
Notes: nd= no data, # = small sample size * = outfall pipe samples

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4. Reduce downstream channel erosion and protect from upland sediment

1. Carefully select and adapt stormwater practices for arid watersheds

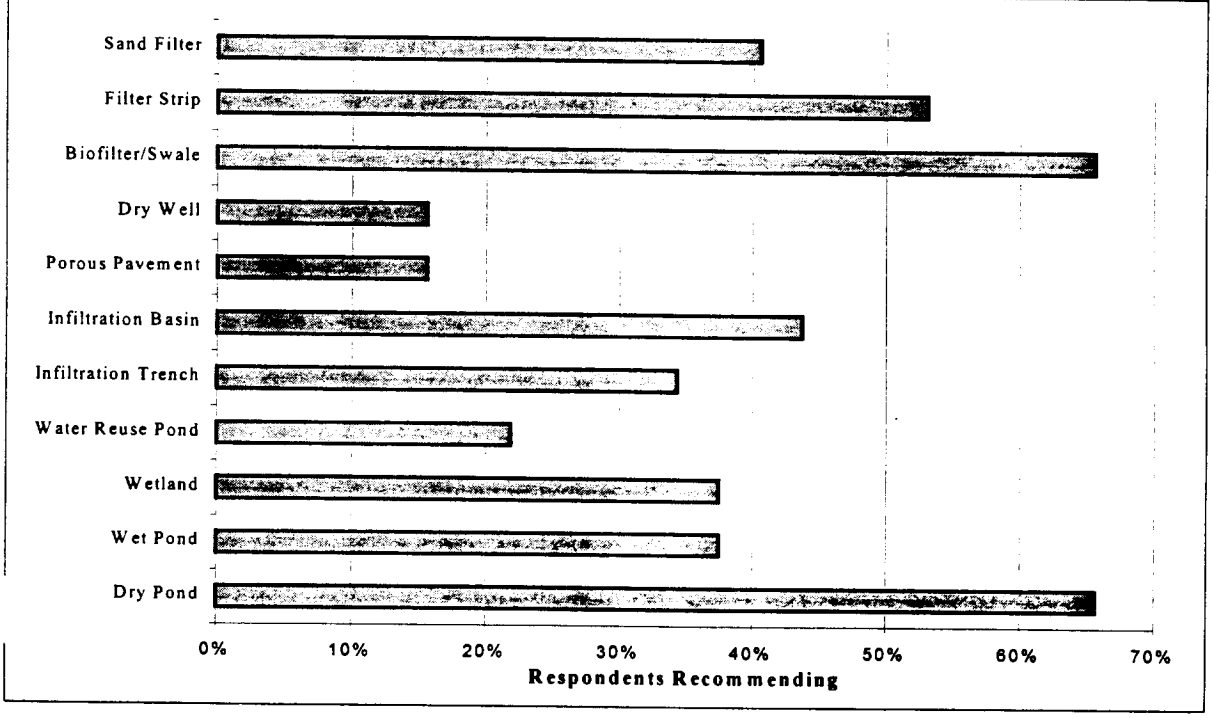
Some stormwater practices developed in humid watersheds are simply not applicable to arid watersheds, and most others require major modifications to be effective (Table 4). Even in semi-arid watersheds, design criteria for most stormwater practices need to be revised to meet performance and maintenance objectives. The following section highlights some of the major design and performance differences to consider for major stormwater practices.

Extended Detention (ED) Dry Ponds. The most widely utilized stormwater practices in arid and semi-arid watersheds were dry ponds, according to the Center's survey (Figure 3). Most were designed exclusively for flood control, but can be easily modified to provide greater treatment of stormwater quality. While dry ED ponds are not noted for their ability to remove soluble pollutants, they are reasonably effective in removing sediment and other pollutants associated with particulate matter (see *Technical Note* 95). In addition, ED ponds can play a key role in downstream channel protection, if the appropriate design storm is selected, and adequate upstream pretreatment is incorporated. Dry extended detention is the most feasible pond practice in arid watersheds, since they do not require a permanent pool of water.

Wet Ponds. Wet ponds are often impractical in arid watersheds since it is not possible to maintain a permanent pool without supplemental water, and the ponds become stagnant between storms. Wet ponds are feasible in some semi-arid watersheds, on the other hand, when carefully designed. Performance monitoring studies have demonstrated that wet ponds exhibit greater pollutant removal than other stormwater practices in Austin, Texas, at a lower cost per volume treated (COA, 1998, and *Technical Note* XX). In arid and semi-arid climates, wet ponds can require supplemental water to maintain a stable pool elevation. Saunders and Gilroy (1997) reported that 2.6 acre-feet per year of supplemental water were needed to maintain a permanent pool of only 0.29 acre-feet. Generally speaking, stormwater designers working in semi-arid watersheds should design for a variable pool level that can have as much as a three-foot draw down during the dry season. The use of wetland plants along the pond's shoreline margin can help conceal the drop in water level, but managers will need to reconcile themselves to chronic algal blooms, high densities of aquatic plants and occasional odor problems. The City of Austin has prepared useful wet pond design criteria to address these issues (COA, 1997).

Stormwater Wetlands. Few communities recommend the use of stormwater wetlands in either arid or semi-arid watersheds. Once again, the draw down rates caused by evaporation make it difficult to impossible to maintain standing water that can sustain emergent wetland plants, unless copious subsidies of supplemental water

Figure 3: BMP Preferences in Arid Climates



are supplied. One interesting exception was a gravel-based wetland that treated parking lot runoff in Phoenix, Arizona (Wass and Fox, 1995). While the wetland did require some supplemental water, evaporation was reduced by the overlying gravel bed, and the wetland achieved relatively high removal rates of oil and grease.

Sand Filters. Sand filters continue to be one of the most common practices used to treat the quality of stormwater in both arid and semi-arid watersheds. Sand filters require no supplemental water and can be used with almost any soil type. Still, the basic sand filter design continues to evolve to counter the tough design conditions found in these regions. For example, Urbonas (1997) evaluated sand filter performance in Denver, Colorado, and concluded that designs need to be modified to account for the greater sediment buildup in arid regions (*Technical Note* 100). Urbonas found that the

Table 4. Design Modifications for Stormwater Practices in Arid and Semi-Arid Watersheds

Stormwater Practice	Arid Watersheds	Semi-Arid Watersheds
ED Dry Ponds	PREFERRED multiple storm ED stable pilot channels "dry" forebay	ACCEPTABLE dry or wet forebay needed
Wet Ponds	NOT RECOMMENDED evaporation rates are too high to maintain a normal pool without extensive use of scarce water	LIMITED USE liners to prevent water loss require water balance analysis design for a variable rather than permanent normal pool use water sources such as AC condensate for pool aeration unit to prevent stagnation
Stormwater Wetlands	NOT RECOMMENDED evaporation rates too great to maintain wetland plants	LIMITED USE require supplemental water submerged gravel wetlands can help reduce water loss
Sand Filters	PREFERRED requires greater pretreatment exclude pervious areas	PREFERRED refer to COA, 1997 for design criteria
Bioretention	MAJOR MODIFICATION no irrigation better pretreatment treat no pervious area xeriscape plants or no plants replace mulch with gravel	MAJOR MODIFICATION use runoff to supplement irrigation use xeriscaping plants avoid trees replace mulch with gravel
Rooftop Infiltration	PREFERRED dry well design for recharge of residential rooftops	PREFERRED recharge rooftop runoff on-site unless the land use is a hotspot
Infiltration	MAJOR MODIFICATION no recharge for hotspot land uses treat no pervious area multiple pretreatment soil limitations	MAJOR MODIFICATION no recharge for hotspot land uses treat no pervious area multiple pretreatment
Swales	NOT RECOMMENDED not recommended for pollutant removal, but rock berms and grade control needed for open channels to prevent channel erosion	LIMITED USE limited use unless irrigated rock berms and grade control essential to prevent erosion in open channels

test sand filter quickly became clogged with sediment after just a few storms, and recommended that sand filters include a more frequent sediment clean out regime, an increase in the filter bed size, and upstream detention to provide greater sediment pretreatment. Some additional research on the performance and longevity of sand filters in the semi-arid climate of Austin, Texas can be found in *Technical Notes* 111 and 112 (this issue).

Bioretention. The use of bioretention as a stormwater treatment practice is not very common in many western communities at the present time. Clearly, this practice will require extensive modification to work in arid watersheds. This might entail xeriscape plantings, use of gravel instead of mulch as ground cover, and better pretreatment. Sprinkler irrigation of bioretention areas should be avoided.

Infiltration Practices. While a number of communities allowed the use of infiltration in arid and semi-arid watersheds, few encouraged its use. Two concerns were frequently cited as the reason for lack of enthusiasm for structural infiltration. The first concern was that infiltration practices are too susceptible to rapid clogging, given the high erosion rates that are customary in arid and semi-arid watersheds. The second concern was that untreated stormwater could potentially contaminate the aquifers that are used for groundwater recharge.

Swales. The use of grass swales for stormwater treatment was rarely reported for arid watersheds, but was much more common in semi-arid conditions. Grass swales are widely used as a stormwater practice in residential developments in Boise, Idaho, but the dense turf can only be maintained in these arid conditions through the use of sprinkler irrigation systems. The pollutant removal performance of swales in arid and semi-arid watersheds appears to be mixed (Table 5). Poor to negative pollutant removal performance was reported in a Denver swale that was not irrigated (Urbonas, 1999 -personal communication). In the semi-arid climate of Austin, Texas, Barret et al (1998) reported excellent pollutant removal in two highway swales that were vegetated but not irrigated. Similar performance was also noted in a non-irrigated swale monitored by the City of Austin (COA, 1997).

2. Minimize irrigation needs for stormwater practices

In arid climates, all sources of water, including stormwater runoff, need to be viewed as a resource. It seems senseless, therefore, to irrigate a practice with 50 inches of scarce water a year so that it can be ready to treat the stormwater runoff produced from 10 inches of rain a year. Still, irrigation of stormwater practices the 183 and Walnut Creek sites. In our survey of stormwater managers, 65% reported that irrigation was commonly used to establish and maintain vegetated cover for most stormwater practices.

Irrigation should be limited to practices that meet some other landscaping or recreational need in a community and would be irrigated anyway, such as landscaping islands in commercial areas and road rights of way. Irrigation may also be a useful strategy for dry ED ponds that are designed for dual use, i.e., facilities that serve as a ballfield or community park during the dry season. Even when irrigation is used, practices should be designed to "harvest" stormwater, and therefore reduce irrigation needs. Landscapers should also consider planting native drought resistant plant material to

Table 5. Performance of Vegetated Swales in Semiarid Climates
Source: Barret et al, 1997, and COA, 1998

	Highway 183 median	Walnut Creek	City of Austin Swale
Parameter	Mass Load Reduction (%)		
TSS	89	87	68
COD	68	69	33
TP	55	45	43
TKN	46	54	32
Nitrate	59	36	(-2)
Zinc	93	79	ns
Lead	52	31	ns

ns = not sampled. Fecal coliform and fecal strep removals were negative at the 183 and Walnut Creek sites.

reduce water consumption.

3. Protect groundwater resources and encourage recharge

In many arid communities, protection of groundwater resources is the primary driving force behind stormwater treatment. Ironically, early efforts to use stormwater to recharge groundwater have resulted in some groundwater quality concerns. In Arizona, for example, stormwater was traditionally injected into 10 to 40 foot deep dry wells to provide for groundwater recharge. Concerns were raised that deep injection could increase the risk of localized groundwater contamination, since untreated stormwater can be a source of pollutants, particularly if the proposed land use is classified as a stormwater hotspot.

Wilson et al (1990) evaluated the risk of dry well stormwater contamination in Pima County, Arizona, and determined that dry wells had elevated pollutant concentrations in local groundwater. The build up of pollutant levels that had occurred over several decades tended to be localized, and did not exceed drinking water standards. Still, it is important to keep in mind that dry wells and other injection recharge methods should only be used to infiltrate relatively "clean" runoff, such as residential roofs. Other surface infiltration practices, such as trenches and basins, can also potentially contaminate groundwater unless they are carefully designed for runoff pretreatment, provide a significant soil separation distance to the aquifer, and are not used on "hot spot" runoff sites.

In many arid communities, protection of groundwater resources is the primary driving force behind stormwater treatment.

4. Design to reduce channel erosion

Above all, the western stormwater practice must be designed to reduce *downstream* erosion in ephemeral channels, while at the same time protecting itself from sediment deposition from *upstream* sources. This is a daunting challenge for any engineer, but the following ideas can help.

With respect to *downstream channel erosion*, designers will need to clamp down on the storm events that produce active erosion in channels. This might entail the design of ponds or basins that can provide 12 hours of extended detention for the one-year return interval storm event (which is usually no more than an inch or two in most arid and semi-arid watersheds). Local geomorphic assessment will probably be needed to set channel protection criteria, and these hydraulic studies are probably the most critical research priority in both arid and semi-arid watersheds today. Without ED channel protection, designers must rely on clumsy and localized engineering techniques to protect ditches and channels from eroding, such as grade control, rock berms, rip-rap, or even concrete lined channels. Bioengineering options to stabilize downstream channels in arid watersheds are limited, and often require erosion control blankets to retain moisture and seeds, as well as extensive irrigation.

Upstream erosion quickly reduces the capacity of any stormwater practice in an arid or semi-arid watershed, due to sparse vegetation cover and erosion from upstream gullies, ditches, or channels. Designers have several options to deal with this problem. The most effective option is to locate the practice so that it can only accept runoff from impervious areas, particularly for infiltration, sand filters and bioretention. Even then, the practice will still be subject to sediment transported by the wind.

All stormwater practices in arid and semi-arid watersheds require greater pretreatment *than in humid watersheds.* Seventy percent of the arid stormwater managers surveys reported that sediment clogging and deposition problems were a major design and maintenance problem for nearly all of their stormwater practices.

Even though not all upstream erosion can be prevented, designers can compensate for sediment buildup within the stormwater practice itself. Pretreatment and over-sizing can prevent the loss of storage or clogging associated with sediment deposition. As noted in *Technical Note* 112, rock berms or vertical gravel filters are ideally suited as a pretreatment device.

Most stormwater managers surveyed indicated that sediment cleanout regimes for stormwater practices need to be more frequent in arid and semi-arid watersheds, with removal after major storms and at a minimum, once a year. Lastly, stormwater managers consistently emphasized the need for better upland erosion control during construction. A full 65% of the managers reported that upstream erosion and sediment control was a major emphasis during their stormwater plan review.

Summary

It is clear that stormwater managers in arid and semi-arid climates cannot simply import the stormwater programs and practices that were originally developed for humid watersheds. Instead, they will need to develop stormwater solutions that combine aggressive source control, better site design and stormwater practices in a distinctly western context. Regulators, in turn, need to recognize that western climates, terrain and water resource objectives are different, and be flexible and willing to experiment with new approaches in municipal stormwater programs. Lastly, stormwater managers from arid and semi-arid watersheds must

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work more closely together to share experiences about the stormwater solutions that work and fail. It is only through this dialogue that western communities can gradually engineer stormwater practices that are rugged enough to withstand the demanding challenges of the arid and semi-arid west.

References

Barret, M., M. Keblin, P. Walsh. , J. Malina and R. Charbeneau. 1998. *Evaluation of the performance of permanent runoff controls: summary and conclusions.* Center for Transportation Research. Texas Dept of Transportation. University of Texas. Austin, TX. 37 pp.

Brush, S, M. Jennings, J. Young, and H. Mcreath. 1995. *NPDES monitoring–Dallas/Forth Worth Texas area.* pp. 115-143. In *Stormwater NPDES Monitoring Needs.* American Society of Civil Engineers.

Camp Dresser and McKee (CDM), Larry Walker Associates, and Uribe and Associates, and Resources Planning Associates. 1993. *California stormwater best management practices handbook.* Prepared for: California Water Quality Control Board. Sacramento, CA

Caraco, D. 1997. *BMP supplement for cold climates.* U.S. Environmental Protection Agency. Center for Watershed Protection. Ellicott City, MD. 112 pp.

Center for Watershed Protection (CWP). 1997. *Survey of stormwater managers in arid and semi-arid climates.* Ellicott City, MD, Unpublished data.

City of Austin (COA). 1994. *Environmental criteria manual: guidelines for BMP design.* City of Austin Drainage Utility. Austin, TX.

City of Austin, (COA) 1997. Wet Ponds. Section 1.6.6.C of *Environmental Criteria Manual.* City of Austin, TX Drainage Utility.

City of Tucson (COT) Stormwater Quality Program. 1996. *Water harvesting fact sheets.* Tucson, AZ.

Claytor, R. and T. Schueler. 1997. *Design of stormwater filtering systems.* Prepared for: Chesapeake Research Consortium. Center for Watershed Protection. Ellicott City, MD.

Denver Regional Council of Governments (DRCOG). 1983. *Urban runoff quality in the Denver region.* Prepared for US EPA NURP Program. Denver, CO. 240 pp.

Glick, R., G. Chang and M. Barret. 1998. *Monitoring and evaluation of stormwater quality control basins.* Water Environment Federation Speciality Conference. Proceedings Watershed Management: Moving from Theory to Implementation. Denver, CO. May 3-6, 1998.

Guay, J. 1996. *Effects of increased urbanization from 1970's to 1990's on storm runoff characteristics in Perris Valley, California.* USGS Water Resources Investigations Report. 95-4273.

Harris, T., J. Saunders, and. W. Lewis. 1997. *Urban rivers in arid environments–unique ecosystems.* Pp. 421-438 In *Effects of Watershed Development and Management of Aquatic Ecosystems.* L. Roesner, editor. American Society of Civil Engineers. New York, NY.

Kjelstrom, L. 1995. *Data for and adjusted regional regression models of volume and quality of urban stormwater runoff in Boise and Garden City, Idaho, 1993-94.* United States Geological Survey Water Resources Investigations Report 95-4228.

Lopes, T, K. Fossum, J. Phillips and J. Marical. 1995. *Statistical summary of selected physical, chemical, and microbial contaminants and estimates of constituent loads in urban stormwater in Maricopa County, Arizona.* USGS Water Resources Investigations Report 94-4240.

Maddock, T. and W. Hines. 1995. *Meeting future public water supply needs: a Southwest perspective.* Water Resources Bulletin, 31(2): 317-329

Mizell, S. and R. French. 1995. *Beneficial use of dry weather flow in the Las Vegas Valley, Nevada. Water Resources Bulletin.* 31(3): 447-461.

National Oceanographic and Atmospheric Administration (NOAA). 1997. *NCDC Summary of the day weather records.* Silver Spring, MD.

Saunders and Gilroy. 1997. *Treatment of nonpoint source pollution with wetland/aquatic ecosystem best management practices.* Texas Water Development Board. Lower Colorado River Authority. Austin, TX

Smullen, J, and K. Cave. 1998. *Updating the U.S. nationwide urban runoff quality database pp 202-218 in Conference Proceedings.* Third International Conference on Diffuse Pollution. International Association of Water Quality. Edinburgh, Scotland.

COALITION FOR
CLEAN AIR
10780 Santa Monica Blvd., Suite 210 • Los Angeles, CA 90025
(310) 441-1544 • FAX (310) 446-4362 • E-mail airclean@igc.org

January 20, 2000

2000 JAN 24 P 12:42

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

re: Stormwater Runoff Standards

Dear Mr. Dickerson,

As you know, on January 26th the Los Angeles Regional Water Quality Control Board will be considering a staff proposal to require new and redevelopments to treat or infiltrate 100% of the runoff from up to and including a .75 inch storm. This three quarter-inch, 24-hour storm standard is a reasonable and necessary step toward clean coastal and inland waters. Unfortunately, the proposal is also riddled with unnecessary and crippling exemptions. As Executive Director of the Coalition for Clean Air, I am writing in order to urge you to adopt this proposal, but only after eliminating exemptions such as the rooftop, small restaurant, local practices, and impracticability exceptions.

Urban storm water runoff, as a non-point source of water pollution, is a serious environmental threat. Your proposal should be guided throughout by the goal of reducing storm water pollution loads to the maximum extent practicable, and should seek to minimize the amount of stormwater directed to impermeable areas and to maximize the percentage of permeable surface in all categories of development and redevelopment.

While adoption of a three quarter-inch, 24-hour storm standard is the right way to move forward, it will only be effective if a host of unnecessary exemptions are eliminated from the proposal. One of the worst of the exemptions included in the current proposal is the Rooftop Exclusion, which could actually have the effect of encouraging larger rooftops, and therefore less permeable surface areas per site. Furthermore, rooftop runoff is allowed to bypass mitigation measures and may pass directly into street gutters and storm drains, despite the fact that rooftops collect aerial pollutants. There is no justification of this exemption within the context of efforts to achieve water quality improvements.

Other exemptions further weaken the proposed rule. All restaurants, regardless of size, are potential sources of polluted runoff, and should be included within the rule's provisions. Furthermore, you should adopt a proposal that allows for effective, even-handed enforcement of SUSMP requirements. We are concerned that effective enforcement will be compromised by current language which gives deference to existing local practices and which allows for "so-called" impracticability waivers. Finally, we would like to see regulation of runoff from parking lots of all types, including a list of BMPs applicable to all parking lots.

11-364

As a recent L.A. Times series made clear, toxic pollution of Santa Monica Bay, and other coastal areas is a worsening problem, and the solutions available to solve this problem are limited and often expensive. Besides endangering public health, polluted stormwater runoff endangers aquatic life, in streams and rivers, as well as offshore. Luckily, you have the opportunity to adopt a proposal that is both effective, and practical.

Clean beaches and streams are important not only for public health and aquatic wildlife, but for our economy as well. Coastal tourism and recreation supports many Southern California businesses, and as our coastline becomes polluted their business declines – and our entire regional economy is affected. Reducing stormwater pollution at the construction phase is in fact the most cost-effective way to tackle this complex problem.

Of course this solution is not cost-free, but it is critical that we anticipate the effects of new developments, and their costs to the public, so that those problems can be mitigated at the outset, and anticipated as one of the costs of new development. This is not only the most cost-effective way to address the problem, but it is consistent with the principles of a market economy, which, to function well, requires that the costs of a product be reflected in its price. Since new developments increase the problem of polluted stormwater runoff, we must ask that the costs of minimizing these effects be included in the planning process, and not shifted to the public at-large, after the fact, at much greater expense.

In sum, I ask you to please support the three-quarter inch standard, with no exceptions, to mitigate the effects of storm water runoff from new and redevelopment. It is the right thing to do, for the public health, for our economy, for aquatic wildlife.

Sincerely,

Tim Carmichael

Tim Carmichael
Executive Director

Community Coalition for Change
CCC
IMPROVEMENT THROUGH ACTION
Founded 1994

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DEC - 8 1999
BY:.....

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December 6, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

PO Box 59027, Los Angeles, California 90059 • Voice Mail (310) 609-4309 • Fax (310) 527-2774 e-mail CCChange@aol.com

R0069494

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Rahman Shabazz, President
Community Coalition for Change

XS

DEFEND THE BAY

A CALIFORNIA NON-PROFIT CORPORATION - FOUNDED 1995

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(949) 722-7822
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SUITE 200
471 OLD NEWPORT BLVD.
NEWPORT BEACH
CALIFORNIA, 92663

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December 12, 1999

RECEIVED
1999 DEC 14 P 1:49
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105
Attn: Dennis Dickerson

RE: Storm water runoff standards

Dear LARWQCB:

I am writing to encourage you to set storm water runoff standards as soon as possible.

Storm water runoff is a huge source of pollution for our recreational waters and clearly degrades our oceans and bays to the point where they are not suitable for human contact for days after a significant storm event.

This does not have to be the case. The technology exists to reduce pollutants, but the business community will not be interested in installing retention basins, etc, until the RWQCB mandates their installation.

There is no reason to delay the implementation of runoff standards. The Los Angeles region has made huge strides in setting these standards, with significant input from the stakeholders. It is time to put these standards into effect now.

Thank you,

Bob Caustin

Robert Caustin
Founding Director

R0069496

COMMUNICATIONS

Ruben Aron
12021 Wilshire Blvd., #5
Los Angeles, CA 900

January 5, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Ruben Aronin

R0069497

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Education for Sustainable Living
1718 Wellesley Ave.
Los Angeles, CA 90025 USA
Phone: 310-826-6152
Net: ak870@lafn.org
19 January, 2000

2000 JAN 21 P 2:42

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Dennis Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

R0069498

January 11, 2000

Dennis Dickerson,
Executive Director
Los Angeles Regional Water
Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

RE: RUNOFF STANDARDS FOR NEW DEVELOPMENT AND REDEVELOPMENT

Dear Mr. Dickerson:

The Environmental Defense Center (EDC) is a non-profit environmental law firm working to protect and restore watersheds and water quality on the Central California Coast.

We are writing to remind you that you have the opportunity to significantly reduce urban runoff, the number one source of pollution in our coastal and inland waters. As we are grappling with the same runoff issues to your north, we look to your Board to set a precedent for water pollution control. Therefore, please adopt reasonable design standards for sizing treatment control Best Management Practices at specific new developments and redevelopment projects. Additionally, please make sure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. Another standard for development projects is to require bio-filtration basins (a.k.a. constructed wetlands) for urban stormwater runoff in project designs. Reduce reliance on storm drains, and incorporate vegetated swales and basins in project designs. By adopting these standards, the Regional Water Quality Control Board has the opportunity to reverse the trend of watershed and water quality degradation, and to set a precedent for improvements in other areas.

In urban environments, rainfall is converted into runoff that collects pollutants as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled in stormdrains and culverts and directed untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, southern California has countless beaches that are frequently unsafe for swimming. Creeks have water that is unsafe to touch, and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

R0069499

906 GARDEN ST, SANTA BARBARA, CA 93101 • (805) 963-1622 FAX: (805) 962-3152 E-MAIL: edc@rain.org
31 N. OAK ST, VENTURA, CA 93001 • (805) 643-6147 FAX: (805) 643-6148 E-MAIL: edcvent@west.net

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Central and Southern California's coastal tourism and recreation businesses generate over three billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business. With billions of dollars and human health at stake, the health of our entire regional economy and population is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will reduce the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 100 million people who visit this region's beaches annually, for the health of our regional economy, and for a more livable region, please adopt the three quarter-inch standard and other design standards that reduce polluted runoff.

Sincerely,

Brian Trautwein
Environmental Analyst

Friends of the Los Angeles River

January 17, 2000

Post-it® Fax Note 7671	Date 1/19/00	# of pages ▶ 2
To DICKERSON	From WINTER	
Co./Dept. LARWQCB	Co. FOLAR	
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Fax # 213 576 6640	Fax # 818 9800700	

HARD COPY TO FOLLOW

Mr. Dennis Dickerson, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th St., Suite 200
Los Angeles, CA 90013

RE: Standard Urban Stormwater Mitigation Permit

Dear Mr. Dickerson:

Friends of the Los Angeles River (FoLAR) fully concur with the comments submitted by NRDC on Friday, January 14, 2000.

In addition we would like to submit comments relating to our own experiences with development standards in Los Angeles.

In November of 1998, FoLAR entered into a mitigation agreement with Legacy Partners Commercial, Inc. for the development of a business park on 49 acres at the Taylor Yards. This agreement was included in the final Mitigated Negative Declaration for the property. The Taylor Yards are a riverfront property which had never been previously developed or paved. FoLAR's concerns were related to the inherent increase in runoff that standard development practices would necessarily cause to contribute to this soft bottom section of the river. Legacy's president, Bill Shubin, being an avid surfer, shared our concerns.

FoLAR's consultants worked jointly with Legacy's engineering experts to develop a drainage design plan, which would retain and detain surface water runoff and would implement surface water quality measures. The plan was designed so as not to increase peak flows of surface water runoff in a 100-year storm event.

Facilities were designed to prevent or otherwise minimize surface water runoff from the developed parcel. Efforts resulted in a parking lot and landscaping design which direct surface water runoff to bio-swales, allowing for natural percolation of rainwater to the groundwater via an 18" perforated pipe subdrain system. The final design accomplished a system that can immediately accommodate a 1/2" rain event every 24 hours. Additionally, storm drain improvements were designed to drain surface water runoff on-site during the peak period of a 100-year storm event. This latter is accommodated through detention, which then over time allows gradual percolation through the bioswales.

The innovative design has the positive result of accommodating a capital event (and detaining the additional peak flows) while eliminating the need for certain on-site storm drain improvements. Storm drain cost savings were re-allocated to construct a system for retention and percolation.

Much of the resistance within the building industry seems to stem from a fear that approvals will be too difficult to obtain or that these new standards will send development costs skyrocketing

Our experience with Legacy shows that costs are not necessarily increased, but shifted. And while initial meetings with building and safety and other agencies were challenging, a spirit of cooperation prevailed and these innovative concepts were readily approved. Moreover, it will be easier and easier with each new project. Change is possible and in this instance, necessary.

We agree with Legacy Partners' Michael Conway, project manager who says he "can point to this project as evidencing successful cooperation between private industry and public interest." And we would encourage other developers to follow their lead.

Melanie Winter
Executive Director

Friends of the Los Angeles River

VIA FACSIMILE
Page 1 of 2

September 16, 1999

Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W 4th Street, Suite 200
Los Angeles, CA 90013

RE: Support for Numerical Mitigation Measures for all Standard Urban Stormwater Mitigation Plans

Dear Mr. Dickerson:

Friends of the Los Angeles River (FoLAR) supports the staff recommendation to derive numerical mitigation measures for all SUSMPs in accordance with the formula set forth in its report. In addition FoLAR believes that there is no justification for the numerical mitigation measures for the incorporated areas of the County to be less stringent than those for the unincorporated ones. All environmental rules and regulations should be applied in a fair and equitable manner throughout the watershed.

In the business world setting numerical targets is a way-of-life. Setting numerical goals and developing forecasts is not an exact science. It is always based on judgement and a preponderance of evidence. In the case of the SUSMPs, your staff has applied sound scientific judgement and advocates that numerical mitigation measures be established for all SUSMPs.

RE: Support for Comments Submitted by Heal the Bay

Members of the FoLAR Technical Advisory Board have reviewed the draft of the letter submitted by Mark Gold and Lisa Boyle, Esq. We concur in their analysis and commentary, which are consistent with policies and practices supported by our organization in its efforts to revitalize the Los Angeles River Watershed. FoLAR would appreciate it if the Board would direct staff to:

- Define increased potential for downstream erosion as discharges from hillside properties and discharges to riparian, wetland, and estuarine habitats
- Consider the synergistic impact of pollutants
- Account for incremental increases of pollutants of concern over time as population grows
- Establish an additional SUSMP for development that may impact Environmentally Sensitive Areas
- Incorporate mitigation of runoff from parking lots as a separate requirement in every BMP with the exception of single hillside residences
- Include wildlife corridors in the section related to "Conservation of Natural Areas" in the SUSMPs
- Delete phrase "if applicable" from section titled "Protect Slopes and Channels" and define the term "slope"
- Add wording that encourages use of natural drainage systems when possible, prohibits use of concrete channels without adequate mitigation, and to the extent possible eliminates or reduces runoff to unlined channels
- Ensure that a minimum standard is set for determining the point at which costs exceed benefits threshold is set to be certain that less environmentally progressive municipalities are not given a loophole to avoid applicability of the SUSMPs in their jurisdiction

FoLAR P.O. Box 292134 Los Angeles, CA 90029 323.223.0585

Friends of the Los Angeles River

VIA FACSIMILE
Page 2 of 2

- Reinsert the requirements to minimize the amount of stormwater directed to impermeable areas, maximize the percentage of permeable surface, and reduce stormwater load to the maximum extent practicable in each SUSMPs
- Require that in all SUSMPs, except those for hillside residences, 25% of landscaped areas be xeriscape
- Avoid use of energy dissipaters that would impinge on existing habitat
- Prohibit certain unacceptable connections to the MS-4 as described by Heal The Bay
- Recommend BMP maintenance guidelines in the model program
- Review local ordinances, or adopt the current County definitions for setting minimum standards for natural slopes and height of cut or fill slopes
- Apply requirements for gasoline outlets to all retail development that will include a fuel dispenser especially car wash operations and marinas, which may not even have pumps with automatic shut-off valves

Thank you for the opportunity to comment on the August 11, 1999 draft of the SUSMPs. If you would like to discuss FoLAR's position on SUSMPs, please call Melanie Winter at 323- 223-0585

Very truly yours,

John V. Greenwood, Board Member
Chair -- Technical Advisory Board

Cc: Melanie Winter, Executive Director

Friends of the Los Angeles River

RECEIVED
99 AUG -9 PM 3:51
QUALITY CONTROL BOARD
LOS ANGELES REGION

Friday, August 6, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Direction and oversight to the "Receiving Water Subcommittee - Los Angeles River Watershed of the Los Angeles County Municipal Stormwater Permit".

Dear Mr. Dickerson,

This is a request for participation by the Regional Board to either Chair or Co-Chair the above referenced "Receiving Water subcommittee". The request is from both Mr. Glen Howe of the Los Angeles County Department of Public Works Stormwater Program and myself. We were both able to share a few of our concerns with Mr. Xavier Swamikannu yesterday morning during a meeting on the Stormwater Education Outreach to the Chinese and Asian Community.

The need for the Regional Board involvement includes providing leadership and coordination of ongoing and future monitoring efforts on the Los Angeles River. I am aware of some of these efforts: Los Angeles River monitoring from the Supplemental Environmental Projects from the Los Angeles City Sanitation Bureau, National Pollutant Discharge Elimination System receiving water monitoring and monitoring for development of the Total Maximum Daily Loads. The municipal Stormwater receiving water monitoring for the upcoming permit renewal in two years needs to be coordinated with these other efforts. This will provide for the most effective use of the limited sampling money available.

Thank you for consideration of these comments. Our mission statement is *to revitalize and protect the Los Angeles River -a living urban river system -through inclusive planning, education and wise stewardship.* You can reach me at (626)794-0487.

Sincerely,

Jacqueline Lambrichts
Technical Advisory Board - Water Quality

FoLAR P.O. Box 292134 Los Angeles, CA 90029 323.223.0585

cc: LACDPW - Grant/Howe
FoLAR - MacAdams/Mui

R0069505

BLANK

Heal the Bay

URGENT ACTION ALERT

For more detailed information, visit our website at www.healthebay.org and select Action Alert link.

Public Hearing for the Regional Water Quality Control Board

Wednesday, January 26, 2000
9:00am

A historical opportunity to combat ocean pollution at the source!

Richard H. Chambers Court of Appeals Building
Main Room #3
125 South Grand Avenue, Pasadena

What is the #1 source of pollution to our coastal and inland waters?

Untreated stormwater runoff.



The Regional Water Quality Control Board is considering numerical standards to quantify the amount of stormwater that must be captured, treated or infiltrated at all new and redevelopment sites before it becomes poison in our rivers and ocean. The Regional Board's staff has proposed that certain new and redevelopments treat or infiltrate 100% of the runoff from up to and including a .75 inch rainstorm. New standards would reduce polluted runoff dramatically.

We must take action now
to protect our environment,
water, and quality of life...
before it's too late.

Heal the Bay will provide a bus to the hearing, leaving from Santa Monica. For more information and to sign up, please call us at **1-800-HEAL BAY, ext. 145.**

R0069507

Heal the Bay

2701 Ocean Park Blvd., Suite 150
Santa Monica CA 90405
310.581.4188 fax 310.581.4195
htb@healthebay.org
www.healthebay.org

January 14, 2000

RECEIVED
JAN 18 2000
BY:.....

Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plans

Dear Mr. Dickerson:

Heal the Bay has reviewed the proposed *Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County* submitted by the Los Angeles Regional Water Quality Control Board Staff on December 7, 1999 (the "December 7th Proposal") for approval by the Executive Officer under the Municipal Storm Water Permit for Los Angeles County and Cities. We hereby join in the comments of the Natural Resources Defense Council (NRDC) and submit the following comments on behalf of Heal the Bay and its members. We also hereby incorporate Heal the Bay's comments submitted on September 7, 1999 concerning the preceding version of the Proposal issued by the Regional Board staff on August 11, 1999 (the August 11th Proposal).

General Comments

Although Heal the Bay found ample room for improvement of the August 11th Proposal (see our comments submitted September 7, 1999), we were so strongly supportive of the numerical mitigation measure proposed therein that we called upon our membership and other citizens and organizations to voice their support for the August 11th proposal as an important step toward cleaner coastal and inland waters. Consequently, we were alarmed to discover that the December 7th Proposal, modified in an apparent effort to placate disgruntled municipalities, takes numerous dramatic steps backwards from achieving enforceable and effective regulation of storm water and from realizing the goals of the Clean Water Act.

Exemptions are the Rule

The December 7th Proposal sets forth the promise of a new era of reduced urban runoff, when priority new and redevelopment sites must apply appropriately designed BMPs to capture, infiltrate or treat runoff generated by the 85th % storm or the 0.75 inch – 24-hour storm. But the promise of this new era of runoff-reduction from new and redevelopment vanishes as exemptions prove to swallow the rule. The following is a list of exemptions to the numerical mitigation standard that serve to vitiate it:

The Rooftop Exclusion

The exclusion of roofing surfaces from the total area for calculation of rainfall or runoff volume to be treated guarantees undersizing of BMPs to accomplish the stated goal of capturing 85% of the total runoff from the sites. Worse yet, the roofing exclusion encourages building from lot line to lot line, and discourages landscaping on site. Thanks to this exclusion, the bigger the rooftop, the less storm water to treat or infiltrate, as storm water from roofing surfaces may be diverted directly to a storm water conveyance system. Thus, rooftop runoff bypasses the mitigation measure and goes straight into street gutters and stormdrains, carrying pollutants to receiving waters. This is exactly what the SUSMP provision and the Stormwater NPDES permit authors were trying avoid.

Rooftop runoff contributes both significant volume and pollutant loadings to the total urban runoff problem. It is a complete travesty that rooftops have been excluded when they serve as the deposition site for so much aerial pollution and provide such a large percentage of the total impermeable surface in this region. The Center for Watershed Protection has demonstrated a strong correlation between the percentage of impermeable surface and the health of receiving waters and habitat.

Finally, the rooftop exclusion has not been used anywhere in the nation and has absolutely no substantiation in the record. Staff developed the exclusion just to appease opponents of the 0.75 inch and 85th % standards. This exclusion has no sensible justification in terms of achieving water quality standards, and can only be seen for what it is, a sell-out to the vocal opposition of the proposed numerical mitigation measure.

Small Restaurants

The exclusion of restaurants less than 5,000 square feet is nonsensical. The size of a restaurant may have little to do with the amount and quality of runoff it produces (they all have kitchens, garbage bins and parking lots), and this exclusion would cover the majority of restaurants.

Local Practices Prevail

Your response to comments states that "federal laws and regulations require that controls on new and redevelopment be enforceable." Yet the December 7th Proposal allows permittees to continue with local practices that conflict with the SUSMP requirements except where those practices would "defeat or circumvent the intent of the SUSMP requirements." This begs the question: How will the Board enforce a standard that can be replaced by any other so long as it doesn't defeat the intent of the standard? The SUSMP should provide definitive standards that are clear to the regulated community and the public in whose interest these standards are adopted.

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Impracticability Waivers

Permittees can provide for a waiver of the SUSMP requirements if "impracticablity" for a specific property can be established. "Recognized situations of impracticability include: (I) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because an underground source of drinking water is less than 10 feet from the soil surface."

Since the December 7th proposal calls for treatment OR infiltration, the listed "recognized situations of impracticability" is perplexing. For example, if infiltration is impracticable because of unstable soil conditions or the risk of groundwater contamination, treatment may be practicable.

One can envision an extremely rare situation at a redevelopment site where there is insufficient room for infiltration or treatment. We are intrigued by the idea of in-lieu fees set forth in the December 7th proposal whereby the project proponent in these cases could contribute to a fund used to reduce the overall amount of storm water pollution in the watershed. However, we question the workability of having the "savings in cost" determined by the project proponent. How will this sum be determined? Infiltration could cost next to nothing, so this storm water abatement fund could add up to a big nothing.

The December 7th proposal should be amended to reflect that certification of groundwater contamination risk or geologic hazards must be provided by a California Registered Geologist.

Finally, the provision that the Executive Director may approve any other justification for impracticability is troublesome. What are the standards? Where is the public in this decision making process? Too much reliance on the Executive Officer's discretion for approval has already led to tremendous delays and spotty implementation of the current Los Angeles County Stormwater NPDES permit.

Clarification of Exemptions not provided

The Regional Water Quality Control Board needs to clarify that the SUSMP requirements apply to all categories of priority development. As stated previously we oppose all exemptions. RWQCB staff has not differentiated between exemptions from the 85th % standard and other SUSMP requirements. Please clarify that exemptions only apply to the 85th% standards, not certain types of gas stations, small restaurants, etc.

Alternative Certification for Storm Water Treatment Mitigation

The provision that allows for permittees to accept a signed "certification" stating that a developer's plan meets the criteria established in the SUSMP, and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria. This "certification" is in lieu of the permittee actually verifying BMP adequacy.

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Heal the Bay is opposed to the proposed self-certification of compliance with no requirements set forth for plan preparers. This system will only work if plan preparers undergo legitimate training and certification as occurs in the fields of lead and asbestos abatement.

Guidance to Cities

The December 7th Proposal states in the "Background" section that "The permittees are required to use this SUSMP to develop their own citywide SUSMP." This guidance is not sufficient. The SUSMP needs introductory language clarifying that the permittees shall adopt the standards set forth therein in their own citywide SUSMPs.

Environmentally Sensitive Areas

Heal the Bay is pleased to see the additional SUSMP for development that may impact Environmentally Sensitive Areas. An Environmentally Sensitive Area (as defined in the Long Beach Storm Water Permit) is (a) an area of special biological significance as designated by the SWRCB, (b) an area designated as a significant natural area by the California Resources Agency, (c) or an area designated as an Area of Ecological Significance by the County of Los Angeles. Clearly these areas require the special protection of a SUSMP for all new and redevelopment, including single family homes. The impacts of single family home development in the Santa Monica Mountains has proven to be nothing less than devastating to some riparian habitats in the mountains. An additional BMP for development in these areas should be a buffer zone of at least 100 feet between any development and an Environmentally Sensitive Area.

However, Heal the Bay finds the category description "located adjacent to or discharging to an environmentally sensitive area" to be too ambiguous. In keeping with the intent of the provision, we propose the following revision: "located *within or directly* adjacent to or discharging *directly* into an environmentally sensitive area."

Parking Lots

Heal the Bay is also pleased to see the additional category for "parking lots 5,000 feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff." However, Heal the Bay suggests, in addition, that mitigation of runoff from parking lots should be a separate requirement in every SUSMP category (with the exception of single hillside residence). This requirement should emphasize that parking lots are a significant source of pollutants in runoff and should include a list of BMPs and good housekeeping requirements applicable to all parking lots. In addition, this section should incorporate the numerical mitigation measure that applies to every SUSMP. The City of Santa Monica has successfully required mitigation of a 1-inch, 24-hour storm at parking lots since 1992.

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Definition of Redevelopment

Heal the Bay was concerned that the trigger for application of the SUSMPs to redevelopment in the August 11th Proposal ("where the cost of new improvements exceeds a predetermined threshold [that] shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements") made for an uneven playing field and decreased the applicability of the SUSMPs in less environmentally-progressive municipalities. We believe that the December 7th Proposal solves this problem with a more general definition for redevelopment.

SUSMP Provisions Applicable to All Categories

As stated in our previous comments, the following requirements should be applicable to all categories:

a) Minimize the amount of storm water directed to impermeable areas;
b) Maximize the percentage of permeable surface; and
c) Reduce storm water pollutant loads to the maximum extent practicable.

We are troubled by the limiting definitions contained within the December 7th Proposal provision entitled "Minimize Storm Water Pollutants of Concern." The definition of "pollutants of concern" limits the applicability of the SUSMP standards unduly, especially when this term is modified by the phrase "that may result in significant impacts." There is no definition provided for "significant impacts." Heal the Bay recommends, in the alternative, "reduce storm water pollutant loads to the maximum extent practicable." This language is derived from the Clean Water Act amendments of 1987 and the Municipal Storm Water Permit for Los Angeles County and Cities (Board Order No. 96-054; NPDES No. CAS614001) Part 2 IIII.A.2).

Discretionary Projects

Heal the Bay objects to the limitation of the December 7th Proposal to "discretionary" projects. Los Angeles County does not limit its program to discretionary projects, and there is no justification for this severe limitation. The SUSMP requirements should apply equally to ministerial and discretionary development projects, just like any other building code requirements. Clearly, a parking lot or commercial development covered by ministerial provisions still is a significant pollutant source that needs appropriately sized and designed BMPs.

Xeriscape

As stated in previous comments by Heal the Bay, please add to all SUSMPs that 25% of required landscaped areas must be vegetated with xeriscape.

Outdoor Material Storage Areas

As stated in previous comments by Heal the Bay, within the SUSMP provision "Properly Design Common Outdoor Material Storage Areas," please address the issue of storm water accumulation

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in secondary containment areas not covered with a roof. Please state that storm water that accumulates in the containment area must be treated or infiltrated, not directly discharged into the storm drain system. Also, please provide guidance on what period storm the secondary containment should store without discharge to the MS-4.

Also, properly designed common storage areas should contain trash containers with lids. This is the most cost-effective BMP to prevent polluted runoff, trash and debris problems.

Wildlife Corridors

As stated in previous comments by Heal the Bay, "Conservation of Natural Areas" in the SUSMPs should include state or locally designated wildlife corridors.

Protect Slopes and Channels

As stated in previous comments by Heal the Bay, "Protect Slopes and Channels" should not be modified by the phrase "if applicable." All project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes an/or channels from eroding and impacting storm water runoff. This section should also define "slope". In addition, this section should include two additional bullet points, as follow:

* Utilize natural drainage systems when possible, and avoid the activity of replacing natural systems with concrete channels and pipes.

* Where possible, eliminate or reduce runoff flow to unlined channels to the maximum extent practicable.

As stated in previous comments, please include within the "Protect Slopes and Channels" SUSMP provision that riprap or other structural energy dissipaters should never impinge on existing habitats.

Unacceptable Connections to the MS-4

The model program fails to prohibit some unacceptable connections to the MS-4. For example: no connections to the MS-4 should come from wash-down areas, restaurants, fueling, and vehicle maintenance areas contained in new and redevelopment.

Proof of Ongoing BMP Maintenance and Control

We are pleased by the inclusion of BMP maintenance guidelines in order to insure that BMPs get maintained after installation. However we suggest the additional requirement that all structural BMPs should be inspected by the property owner on at least a quarterly basis with proof of inspection (a standard form) to be provided to the municipality.

Comments for Specific Plans

Single Family Hillside Residence

Heal the Bay objected to the definition of "hillside" contained in the August 11th Proposal because the definition was left to the local jurisdiction making for an uneven playing field and decreasing the applicability of the SUSMPs in less environmentally-progressive municipalities. As stated in previous comments by Heal the Bay, we argue that in order to be effective, the SUSMP must include minimum standards for natural slopes and height of cut or fill slopes. However, the definition of "hillside" within the December 7th Proposal, including "any natural slope", is too broad. We suggest a review of local ordinances to develop these minimum standards, or adoption of the current definitions in the County Public Works Hydrology/ Sedimentation Manual:
1) grading will occur on any natural slope where the natural slope is 15% or greater, and 2) plans include cut or fill slopes that are 30 feet high or greater.

Retail Gasoline Outlets

As stated in previous comments by Heal the Bay, the requirements for gasoline outlets should apply to any retail operation that includes a fueling dispenser regardless of the development's primary activity classification. For example, fueling stations at car washes pose the same risk of storm water contamination as fueling stations at a gas station. We strongly recommend the applicability of this SUSMP be widened to include any retail development that will include a fuel dispenser, including marina fueling stations that don't even have pumps with automatic shut-off valves.

Conclusion

BMPs must be sized correctly to be effective, and numerical mitigation standards are the only guarantee of proper sizing. Heal the Bay remains committed to the three quarter-inch or 85th %, 24-hour storm standards as both a necessary and reasonable step toward clean coastal and inland waters.

The three quarter-inch and 85th %, 24-hour storm standard are accepted by Los Angeles County. On January 11, 1999 the Coastal commission adopted the 85th % standard (or 10% of the 50 year storm) in their Coastal Polluted Runoff Plan. From now on, all Coastal Development Permits, new Local Coastal Plans and Local Coastal Plan amendments must contain these standards. This will apply to **all** new development in the coastal zone. Also, the California Coastal Commission has adopted an 85th % standard for the town plan portion of the Gualala LCP. Similar or more stringent standards have been adopted in jurisdictions across the country. The standard is economically efficient as it is built into the development phase of projects, and the standard prevents costly cleanup away from the source. After a summer of beach closings and the associated economic hardship, the opposition from municipalities to this standard perplexes us.

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The support for this standard is significant, ranging from respected storm water experts Professor Mike Stenstrom from UCLA and Tom Schueler, Director of the Center for Watershed Protection, and a broad base of environmental groups, to the Los Angeles Times and business people who support a more livable Los Angeles.

However, this decision should not be a popularity contest. With over 150 impaired water bodies in the Los Angeles region and increasing development pressures, we must be guided the desperate state of our water quality and the legal mandate to reduce storm water pollution to the maximum extent practicable.

Unfortunately, the December 7th proposal nearly nullifies the numerical mitigation standard with a host of troubling exceptions. We encourage you to eliminate the rooftop; small restaurant, local practices and impracticability exceptions so that the numerical mitigation standard will provide the tremendous water quality benefits it can bestow upon this region.

Thank you for the opportunity to comment on the December 7th draft of the Proposed Standard Urban Storm Water Mitigation Plan. Please call Lisa Boyle at extension 142 if you have any questions about our comments.

Sincerely,

Mark Gold, D.Env.
Executive Director

Lisa Kaas Boyle, Esq.
Director of Law and Policy

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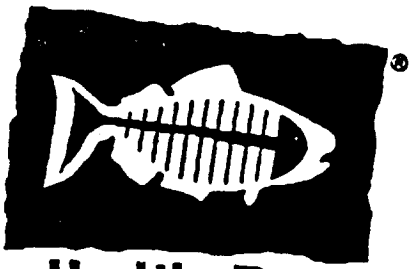

Heal the Bay

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Facsimile Cover Sheet

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Date: SEPTEMBER 7, 1999
Time:
Pages including this cover page: 7

Comments:

R0069516

Heal the Bay

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September 7, 1999

Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Stormwater Mitigation Plans

Dear Mr. Dickerson:

Heal the Bay has reviewed the Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted for approval to the Executive Officer under the municipal storm water permit for Los Angeles County and Cities, and we submit the following comments:

General Comments

1. We are pleased to see the inclusion, in each of the SUSMPs, of the requirement that peak stormwater runoff discharge rates shall not exceed pre-development levels for developments in which an increased peak stormwater discharge rate may result in an increased potential for downstream erosion. However, please define "increased potential for downstream erosion" as discharges from hillside properties and discharges to riparian, wetland and estuarine habitats.

2. We are extremely concerned that the SUSMPs do not provide a numerical mitigation measure for stormwater. This significant exclusion leaves permittees with little guidance to facilitate the development of BMP design criteria, and leaves enforcement agencies and the public without an enforceable standard. As a poor substitute, Section 3, entitled "Minimize Stormwater Pollutants of Concern," is inserted into the SUSMPs for 100+ home subdivisions, 10-99 home subdivisions, and 100+ square-foot commercial developments (hereinafter "Section 3".) Section 3's non-numerical mitigation standard - - requiring that developments must be designed to minimize, to the "maximum extent practicable," the introduction of "pollutants of concern" that may result in "significant impacts," generated from the site to "directly connected impervious areas" and to the stormwater conveyance system as approved by the building official - - provides little more guidance than the simple listing of BMPs that follows the evasive standard. The SUSMPs for automotive repair facilities, retail gasoline outlets, restaurants, and hillside located single-family dwellings do not even contain the problematic, non-numerical mitigation measure set forth in Section 3.

Heal the Bay believed that after the August 10, 1999 workshop on numerical mitigation measures for stormwater, the discussion had moved beyond contemplation of such ineffectual mitigation standards as those set forth in Section 3, and that the remaining task was to determine the most appropriate numerical measure to be inserted into the SUSMPs. Returning to the properly framed issue, the appropriate numerical mitigation measure, Heal

Dennis Dickerson
September 7, 1999

the Bay supports the Regional Board staff recommendation for a numerical mitigation measure for all the SUSMPs, to be derived as follows:

1. the 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area (*Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, 1988*), or
2. a historical-record based reference 24-hour rainfall criterion (.075 inch for the Los Angeles County Area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

As we have stated in previous comments, there is no sensible reason for the numerical mitigation measure for the incorporated portions of the County to be less stringent than for the unincorporated portions of the County. If we are to succeed in the battle against runoff pollution, we must fight together, with every permitee properly armed. As stated on the front page of the 1999 Labor Day edition of the *Los Angeles Times*, "Urban runoff woes are nationwide, but the biggest battleground is Southern California. Nowhere else in the country has such an extreme problem and lags so far behind in curing it." At this critical point in our ecological history, when 50% of our rainfall is converted into runoff that builds in toxicity as it crosses our urbanized landscape before it is channeled and runs into our ocean, we urge you to hold firm to the staff's recommended numerical mitigation measure. Many cites around the country use a more stringent numerical mitigation measure, such as a 1 inch standard or a one-year, 24-hour hour storm standard (which is above 1 inch for Los Angeles). Considering the unique problems of Los Angeles, with so much impervious surface and such vulnerable rivers and coastal waters, we must be progressive as we attempt to solve our stormwater problem.

The staff recommendation is an elegant solution to the demand by the cities for flexibility while it maintains an even playing field with the unincorporated County (.75 inch 24-hour storm retention standard). It provides for the same baseline level of protection (85th percentile capture rate), with a flexible historical-record based reference 24-hour rainfall criterion to achieve it. Thus, municipalities can account for their unique rainfall patterns and hydrology to set their 24-hour rainfall criterion, within the framework of the 85th percentile capture rate.

As various municipalities argue regarding the "cost-effectiveness" of the numerical mitigation measure proposed by the Regional Board staff, we urge you to remember that the cost of bringing our waters into compliance with the Clean Water Act, and especially with the TMDL requirements that we will face in the near future, can only increase if we fail to mitigate stormwater on-site.

Apart from the overarching problem with Section 3 in its lack of a numerical measure, Section 3 is rife with problematic terminology that may impede pollution control. The stated definition of "pollutants of concern" The stated definition of "pollutants of concern" does not specify how they will be determined. Will they be determined for each project? By impaired benificial uses? By contaminated sediment problems downstream? Or will the Regional Board list the pollutants of concern as part of the model program approval?

the Bay supports the Regional Board staff recommendation for a numerical mitigation measure for all the SUSMPs, to be derived as follows:

1. the 85th percentile 24-hour runoff event determined as the maximized capture stormwater volume for the area (*Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, 1988*), or

2. a historical-record based reference 24-hour rainfall criterion (.075 inch for the Los Angeles County Area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

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As various municipalities argue regarding the "cost-effectiveness" of the numerical mitigation measure proposed by the Regional Board staff, we urge you to remember that the cost of bringing our waters into compliance with the Clean Water Act, and especially with the TMDL requirements that we will face in the near future, can only increase if we fail to mitigate stormwater on-site.

Apart from the overarching problem with Section 3 in its lack of a numerical measure, Section 3 is rife with problematic terminology that may impede pollution control. The stated definition of "pollutants of concern" may fail to account for incremental amounts of pollutants that over time may have a degrading effect on water quality. In addition, the "pollutants of concern" definition does not account for synergistic effects of pollutants.

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Moreover, "significant impacts" are not defined, and are used to limit "pollutants of concern." Overall, the standard set forth in Section 3 is vague, overly broad, unworkable and unenforceable. Only a numerical standard will provide sure guidance and an operable tool for enforcement.

3. Each SUSMP needs introductory language clarifying that the permittees shall adopt the standards set forth therein in their own citywide SUSMPs. Otherwise, this model program will be as ineffectual and unenforceable as the County's previous model programs (apart from public education). The Regional Board needs to specifically state that the numeric standards apply to new and redevelopments in all cities in the County except, perhaps, for those new developments in areas with geologic instability problems that would make runoff retention a geologic hazard. However, even in those developments, treatment can occur.

4. Each SUSMP needs introductory language clarifying how permittees are to implement the requirements of the SUSMP in the permitting process.

5. Heal the Bay continues to advocate for an additional SUSMP for development that may impact Environmentally Sensitive Areas. We were under the impression that Regional Board staff agreed with this position. An Environmentally Sensitive Area (as defined in the Long Beach Stormwater Permit) is (a) an area of special biological significance as designated by the SWRCB, (b) an area designated as a significant natural area by the California Resources Agency, (c) or an area designated as an Area of Ecological Significance by the County of Los Angeles. Clearly these areas require the special protection of a SUSMP for all new and redevelopment, including single family homes. The impacts of single family home development in the Santa Monica Mountains has proven to be nothing less than devastating to some riparian habitats in the mountains. An additional BMP for development in these areas should be a buffer zone of at least 100 feet between any development and an Environmentally Sensitive Area.

6. As stated in previous comments by Heal the Bay, mitigation of runoff from parking lots should be a separate requirement in every SUSMP (with the exception of single hillside residence). This section should emphasize that parking lots are a significant source of pollutants in runoff and should include a list of BMPs and good housekeeping requirements applicable to all parking lots. In addition, this section should incorporate the numerical mitigation measure that applies to every SUSMP.

7. As stated in previous comments by Heal the Bay, "Conservation of Natural Areas" in the SUSMPs should include wildlife corridors.

8. As stated in previous comments by Heal the Bay, "Protect Slopes and Channels" should not be modified by the phrase "if applicable." All project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes an/or channels from eroding

and impacting stormwater runoff. This section should also define "slope". In addition, this section should include two addition bullet points, as follow:

* Utilize natural drainage systems when possible, and avoid the use of concrete channels.

* Where possible, eliminate or reduce runoff to unlined channels o the maximum extent practicable.

9. The trigger for improvements to comply with the SUSMPs has been changed from "where the costs of new improvements exceeds 50% of the market value of the existing improvements" to "where the cost of new improvements exceeds a predetermined threshold [that] shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements." Heal the Bay is concerned that this change makes for an uneven playing field and decreases the applicability of the SUSMPs in less environmentally-progressive municipalities.

10. Reinsert the following requirements into each of the SUSMPs:

a) Minimize the amount of stormwater directed to impermeable areas;
b) Maximize the percentage of permeable surface; and
c) Reduce stormwater pollutant load to the maximum extent practicable.

11. As stated in previous comments by Heal the Bay, please add to all SUSMPs (except single family hillside residence) that 25% of required landscaped areas must be vegetated with xeriscape.

12. As stated in previous comments by Heal the Bay, for all SUSMPs which include "Properly Design Common Outdoor Material Storage Areas," please address the issue of stormwater accumulation in secondary containment areas not covered with a roof. Please state that stormwater that accumulates in the containment area must be treated or infiltrated, not directly discharged into the stormdrain system. Also, please provide guidance on what period storm the secondary containment should store without discharge to the MS-4.

13. As stated in previous comments by Heal the Bay, we recommend that the "goals" section be reintroduced to each of the SUSMPs. Obviously, if the goal of each type of SUSMP is clearly articulated, project proponents will prepare better SUSMPs and more effective reviews of project plans will be conducted by permittees.

14. Heal the bay objects to the inclusion of the last sentence in the third paragraph of the Background Section as follows: "Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation shall prevail." This sentence makes the SUSMPs meaningless by ensuring that antiquated regulations that degrade the environment will prevail over new guidelines designed to protect the County's aquatic resources.

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15. For the project slopes and channel sections, riprap or other structural energy dissipaters should never impinge on existing habitats. BMPs should not be inserted at the expense of habitat.

16. Properly designed common storage areas should only contain trash containers with lids. This is the most cost-effective BMP to prevent polluted runoff, trash and debris problems.

17. The model program fails to prohibit some unacceptable connections to the MS-4. For example: no connections to the MS-4 should come from wash-down areas, restaurants, fueling, and vehicle maintenance areas contained in new and redevelopment.

18. The model program needs to contain BMP maintenance guidelines in order to insure that BMPs get maintained after installation. This occurs with clarifiers and oil-separators all the time. We suggest that all structural BMPs should be inspected by the property owner on at least a quarterly basis with proof of inspection (a standard form) to be provided to the municipality.

Comments for Specific Plans

Single Family Hillside Residence

1. Heal the Bay is concerned that the definition of "hillside" within this SUSMP is left to the local jurisdiction making for an uneven playing field and decreasing the applicability of the SUSMPs in less environmentally-progressive municipalities. As stated in previous comments by Heal the Bay, we argue that in order to be effective, the SUSMP must include minimum standards for natural slopes and height of cut or fill slopes. We suggest a review of local ordinances to develop these minimum standards, or adoption of the current definitions in the County building code.

Retail Gasoline Outlets

1. As stated in previous comments by Heal the Bay, the requirements for gasoline outlets should apply to any retail operation that includes a fueling dispenser regardless of the development's primary activity classification. For example, fueling stations at car washes pose the same risk of stormwater contamination as fueling stations at a gas station. We strongly recommend the applicability of this SUSMP be widened to include any retail development that will include a fuel dispenser, including marina fueling stations that don't even have pumps with automatic shut-off valves.

Dennis Dickerson
September 7, 1999

Thank you for the opportunity to comment on the August 11, 1999 draft of the SUSMPs. Please call Lisa Boyle at extension 142 if you have any questions about our comments.

Sincerely,

Mark Gold

Mark Gold, D.Env.
Executive Director

Lisa Kaas Boyle

Lisa Kaas Boyle, Esq.
Director of Law and Policy

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June 10, 1999

Mr. Tim Piasky
County of Los Angeles
Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803-1331

RE: Standard Urban Stormwater Mitigation Plans (Second Draft)

Dear Tim:

Heal the Bay has reviewed the second draft of the SUSMPs for the seven categories of priority projects, and we have the following comments.

General Comments

1) We were pleased to see that the first requirement for every SUSMP is a numerical performance standard for the mitigation of runoff. However, Heal the Bay strongly believes the SUSMPs should match the County's own USMPs which requires mitigation (infiltration and/or treatment) of 100% of site runoff generated from each and every storm event of up to and including 0.75 inches of rainfall. Given that the goal of the SUSMPs as specified in the permit is to reduce pollutants in stormwater to the maximum extent practicable and the County can meet the 0.75 inch standard, there is no reason for the permittees to be held to a lesser standard.

2) Please clarify the language in the requirement to mitigate stormwater runoff from storm events generating up to the 0.6 inches of rainfall from impervious "directly connected areas". Heal the Bay's understanding is the mitigation requirement applies to all impervious areas in which the runoff eventually flows to a stormwater conveyance system.

3) The permit specifically states the SUSMPs must "minimize to the maximum extent practicable, parking lot pollution through the use of appropriate BMPs such as retention, infiltration and good housekeeping." Since the permit specifically identifies parking lots as a source that must be addressed in the SUSMPs, mitigation of runoff from parking lots should be a separate requirement in every SUSMP (with the except of the single family hillside residence). This section should emphasize that parking lots are a significant source of pollutants in runoff and should include a list of BMPs and good housekeeping requirements applicable to parking lots. This section should also refer back to the requirement to mitigate 100% of the runoff from a parking lot up to a 0.75 inch storm.

Earth Share

PRINTED ON RECYCLED PAPER

For single family hillside residences: The number one goal of this SUSMP should be to prevent erosion and sedimentation. Please add this as the first goal.

For the retail gasoline outlet and automotive repair shops: One of the most important goals of this SUSMP is to direct flows from fueling, auto repair, and maintenance areas to sumps or sanitary sewer connections. Please add this goal to the list.

For automotive repair shops: One of the key goals of this SUSMP is to eliminate uncovered outdoor work or storage. Please add this goal to the bulleted items.

10) Please add continuous deflective separation (CDS) units to the list of treatment control BMPs for mitigating stormwater runoff.

11) The permit specifically requires integration of the BMP list for development approved by the Board with the SUSMPs. How will this be accomplished?

12) Heal the Bay strongly believes a SUSMP should be required for every development located in an environmentally sensitive area. (An environmentally sensitive area is an area of special biological significance by the SWRCB or an area designated as a significant natural area by the California Resources Agency or an area designated as an Area of Ecological Significance by the County of Los Angeles.) Clearly, these areas require special protection and SUSMP requirement will ensure that water quality and ecological problems caused in these areas will be reduced if not mitigated. An additional BMP for development in these areas should be a buffer zone of 100 feet between any development and an environmentally sensitive area.

Comments for Specific Plans

Single Family Hillside Residence

The criterion for permittees to determine when a project is considered a hillside project is not defined in the SUSMPs. The SUSMP must include minimum standards for natural slopes and height of cut or fill slopes. Any single-family residential project which exceeds these standards is then considered a hillside residence and must meet the SUSMP's requirements. We suggest the County review local ordinances and develop these minimum standards or use the current definition in the county building code. Without the minimum standards, the effectiveness of this SUSMP is wholly dependent on whether a local ordinance sets protective minimum standards to determine if a project is a hillside development.

Several of the bulleted items (bullets #2, 3, 5-8) in the section Reducing Post-Development Runoff do not appear to apply to development of single family hillside residences.

Under the requirement to protect slopes and channels, the words "if applicable" should be deleted. This requirement will be applicable to all hillside single family residence development.

BLANK

R0069526

Los Angeles River Watershed Management Committee

September 9, 1999

Dr. Xavier Swamikannu
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

SUBJECT: Standard Urban Stormwater Mitigation Plans (SUSMPs)

Dear Dr. Swamikannu:

After extensive discussion and review, the Los Angeles River Watershed Management Committee has voted to oppose the inclusion of any numerical standard in the SUSMPs.

This opposition is based on the lack of information regarding the concentrations of pollutants in the receiving waters. The monitoring data collected to date does not satisfactorily demonstrate that the types of activities the SUSMPs have been developed for are actually causing a negative impact to the receiving waters, nor has it been shown that the proposed BMPs will be effective in reducing the targeted pollutants. In the absence of such data, requiring the additional expense of Treatment Control BMPs needed to meet any numerical standards is not justified.

The L.A. River Watershed is an extremely diverse region, with a multitude of distinct areas. Requiring all developments to meet a single numerical standard may not be the most effective tool for achieving the goals of the NPDES Permit.

If you have any questions, please call me at (562) 802-7880

Sincerely,

John L. Hunter, P.E. CHE
Chair
Los Angeles River Watershed Management Committee

R0069527

SECTION C

TUESDAY

SEPTEMBER 7, 1999 CC

Los Angeles Times

WALL STREET, CALIFORNIA, C4-6 / COMMERCIAL REAL ESTATE, C8-9

BUSINESS

COMMERCIAL REAL ESTATE

Report Urges County to Address Shortage of Affordable Properties

■ Lack of land for homes and industry near urban centers is threatening L.A. area's prosperity, group says.

By BOB HOWARD
SPECIAL TO THE TIMES

"Give me land, lots of land," the old song goes. "Don't fence me in."

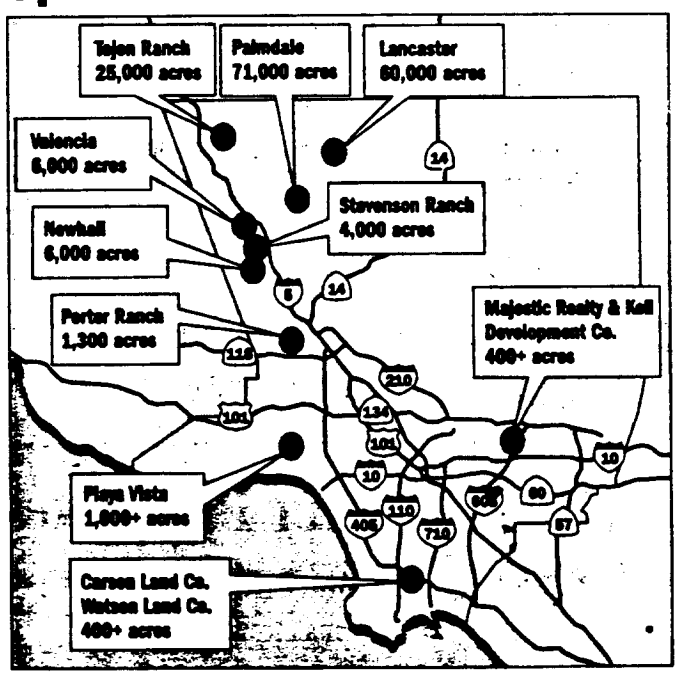
That plea could be Los Angeles County's theme song these days as a shortage of land for homes, apartments and factories poses one of the biggest threats to the county's continued prosperity.

Lack of land for affordable homes and apartments presents an economic problem, experts say, because it means that people who already have a hard time finding affordable housing in Los Angeles County will have an even harder time in the future.

And lack of land to build modern industrial space threatens to prevent Los Angeles County from attracting the kinds of companies that bring the

Please see REPORT, C8

Space Available



Los Angeles County has a shortage of large tracts of land available for residential and industrial construction. Above are some of the areas with the greatest amount of developable land.

Primary sources: Los Angeles Economic Development Corp.; Meyers Group

LESLIE CARLSON/ Los Angeles Times

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REPORT: Shortage

Continued from C1

kinds of jobs L.A. sorely needs, according to a summer report by the Los Angeles Economic Development Corp.

The LAEDC has been lamenting the shortage of industrial space for several years now, but recently it has quantified the shortfall. The county needs about 21 million square feet of new industrial space per year but only about 10 million square feet is being built, according to President Lee Harrington.

That translates into about 1,200 acres of new industrial land needed every year to satisfy current demand, the LAEDC report said. "Failure to meet such demand could result in the loss of more than $700 million annually in high-value manufacturing wages to the local economy," the report said.

The problem isn't so much an absolute lack of land as a lack of land in the right places.

Except for the 1,087-acre Playa Vista tract near Marina del Rey and the 1,300-acre Porter Ranch in the San Fernando Valley, there are few undeveloped tracts close to existing centers of population and commerce in Los Angeles County.

Newhall Land & Farming Co. has about 6,000 acres remaining to develop for homes and industry in Valencia, where it has completed 14,000 homes and 12 million square feet of industrial space, and where it has plans for 9,000 more homes and 10 million square feet more of industrial buildings, said Marlee Lauffer, a company spokeswoman.

In addition to the Valencia property, the company has 6,000 acres of land to develop in Newhall, with about 5,000 acres scheduled for homes and 1,000 acres for industry, Lauffer said. Nearby in Santa Clarita is the partly developed 4,000-acre Stevenson Ranch, which is owned by **Lennar Homes**.

Otherwise, except for the distant edges of the county, the pickings are slim.

About 25,000 acres of county land lies within the 270,000-acre Tejon Ranch, most of which is in Kern County. Lancaster and Palmdale each have about 50,000 acres of land zoned for housing and 10,000 acres zoned for industrial development, according to Jim Gilley, Lancaster City Manager. Palmdale is also the location of the largely undeveloped Ritter Ranch, which is 11,000 acres.

When or how prominently any of these outlying tracts will figure in providing affordable housing and industrial sites, however, is uncertain.

"You can always find land, but there is a lack of well-located land with infrastructure in place, including transportation infrastructure, in areas that are suitable for development," said Cal Hollis, a principal at real estate consulting firm Keyser Marston Associates Inc.

The county lacks the "attractive, safe, campus-like settings" that high-tech companies and high-paying manufacturers want, said Walter Hahn, an economist with E&Y Kenneth Leventhal.

Hahn said the big stretches of empty land in Lancaster and Palmdale are "just too far away" to attract the high-paying manufacturing jobs that cities and counties crave today.

A big reason for the shortage of industrial and residential land closer to L.A.'s core is "zoning for dollars," according to Larry Kosmont of Kosmont Associates, a real estate consultant.

"Cities are strapped for cash, so they have gone after retail uses on whatever sites are still available so that they can capture the sales taxes," Kosmont said. Cities receive 1% of the state sales tax generated within their boundaries.

According to the LAEDC report: "Most cities have battled tooth and nail for the next big-box retailer or auto mall, consuming massive amounts of land which now generates few livable wage jobs. The ultimate outcome is quite foreseeable—too many retail establishments, too few customers, and failed projects."

Industrial land is so scarce that the LAEDC's list of the largest available parcels close to the urban core consists mainly of properties in the 50- to 200-acre range.

Costs of Converting a Property

But what about the millions of square feet of old industrial space in L.A.? Couldn't some of those buildings be razed to make room for modern factories?

"There is a lot of land in South-Central Los Angeles that is well-located for industrial purposes, but the cost of converting [can be] prohibitive" because of the expenses required for demolition and any cleanup of contaminated industrial sites, consultant Hollis said. However, in some cases conversion may make economic sense.

Added Harrington: "What's happening, particularly in South Los Angeles, is that growing companies are having to move out of Los

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Largest Tracts of Available Land in L.A. County

City/Area	Acreage	Name/Type	Zoning	Location
Lancaster	50,000	Multiple small parcels	Residential	Along Antelope Valley Freeway
Palmdale	50,000	Multiple small parcels	Residential	Along Antelope Valley Freeway
Los Angeles Cty.	25,000	Tejon Ranch	Mixed	East of Interstate 5, north of California 138
Palmdale	11,000	Ritter Ranch	Mixed	Along Antelope Valley Freeway
Lancaster	10,000+	Multiple small parcels	Industrial	Along Antelope Valley Freeway
Palmdale	10,000+	Multiple small parcels	Industrial	Along Antelope Valley Freeway
Santa Clarita	4,500	Newhall Land	Mixed	Interstate 5 and Antelope Valley Freeway
Santa Clarita	4,000	Stevenson Ranch	Mixed	West of Interstate 5
Los Angeles	1,300	Porter Ranch	Mixed	Northwest corner of San Fernando Valley
Los Angeles	1,000+	Playa Vista	Mixed	Near Marina del Rey
Industry	400+	Majestic Rlty & Koll Dev.	Industrial	Pomona and San Gabriel River freeways
Carson	400+	Carson Land,Watson Land	Industrial	Rancho Dominguez
Los Angeles	208	Goodyear property	Industrial	Avalon Boulevard and E. Slauson Ave.
Santa Fe Springs	200	Golden Springs	Industrial	Imperial Highway and Shoemaker Avenue
Los Angeles	200	Wilmington property	Industrial	Anaheim Street and East E. Street
Pico Rivera	200	Northrop/Grumman	Industrial	Washington and Rosemead boulevards
Hawthorne	190	Northrop	Industrial	El Segundo Boulevard and Prairie Avenue
Los Angeles	170	Harbor Gateway	Industrial	West 190th Street and Normandie Avenue
Downey	160	NASA/Boeing	Industrial	Imperial Highway and Clark Avenue
Los Angeles	150	Taylor Yard	Industrial	N.San Fernando Road and Glendale Freeway
Los Angeles	100	Former Gen. Motors plant	Mixed	Van Nuys and Roscoe boulevards
Los Angeles	50	Corn field property	Industrial	North Broadway and North Spring Street

List is a representative sample; "zoning" indicates primary intended use of property, but may include other uses; some development may have begun on some sites

Primary sources: Los Angeles County Economic Development Corp.; Meyers Group

Los Angeles Times

Angeles County because they can't find facilities to house their next stage of growth." When the county loses those growing companies, it usually loses more desirable and better-paying jobs.

The relationship between affordable housing and economic development is much closer than it appears, according to economist Hahn. Even the well-paid technicians and professionals employed by technology companies often can't afford to buy the types of homes they want in Los Angeles County, he said.

Another facet of the affordable-housing problem, according to Hahn, is that low- and moderate-wage workers are leaving Los Angeles County for cheaper housing in Riverside and San Bernardino counties. The Inland Empire has already lured many low-wage companies out of Los Angeles County because lower-paying businesses are following the workers there and vice versa, Hahn said.

The prospects for reversing this trend are bleak, Hahn said, because the high costs of land and construction prohibit the development of the thousands of units of affordable housing—mainly apartments—that the county needs for its growing population of low- and moderate-income residents.

"It's a situation we've endured for decades, and it's gotten worse" because the federal government has eliminated all but a few of the programs that once encouraged affordable housing, Hahn said.

The exodus of low- and moderate-paying jobs out of the county, the lack of affordable housing and the inability to attract high-paying employers add up to a dearth of employers in the inner city and a concentration of high-paying jobs in such white-collar areas as Los Angeles' Westside and the beach cities, according to Hahn.

The LAEDC believes many parts of the county, including older industrial areas "resembling the former rust belt areas" of the East and Midwest, have the potential to provide land that could provide jobs.

Political Solutions Suggested

The LAEDC report offers a number of suggestions for improving the situation. Among them:

- Persuade state lawmakers to pass legislation that would allow cities a 25% cut of any state income tax generated by industrial redevelopment
- Form regional joint powers authorities to pursue industrial redevelopment
- Persuade the state to develop "revitalization zone" manufacturing incentives similar to those of the Los Angeles city revitalization zone program
- Develop more industry-oriented training at community colleges.

Harrington said the LAEDC is working on concrete analysis of the benefits that both the cities and the state would reap from the 25% share of the income tax from industrial redevelopment.

"We've got to convince the state that everyone's a winner if we cause this redevelopment to occur," he said. With or without state incentives, Hollis said, the county stands a much better chance of solving its industrial land problems than its residential ones because industrial properties are more likely to be developed in ways that generate profits for developers and taxes for cities.

Neither he nor any of the others interviewed for this article however, sees much chance of solving the affordable-housing shortage.

"Without massive subsidies, you can't make them [apartments] affordable," Hahn said. The federal government recently increased the amount of money it's putting into housing programs in Los Angeles, but "it's still just a drop in the bucket," Hahn said.

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Chapter 7.10

URBAN RUNOFF POLLUTION

Sections:

7.10.010 Findings.
7.10.020 Purpose.
7.10.030 Definitions.
7.10.040 Good housekeeping requirements for reduction of urban runoff at existing properties.
7.10.050 Penalties for failure to comply with good housekeeping requirements.
7.10.060 Urban runoff reduction requirements for new development.
7.10.070 Urban runoff requirements for projects under construction.
7.10.080 Citywide urban runoff pollution education program.
7.10.090 Annual evaluation and revision of good housekeeping requirements, best management practices and construction requirements.

7.10.010 Findings.

The City Council finds and declares:

(a) The City of Santa Monica's storm and surface water drainage system is planned, designed and operated to handle storm water runoff flows from public and private properties. In order to function effectively, this system requires all private connections to it to be properly constructed, maintained and operated.

(b) Storm water runoff flows from individual properties onto the streets, then through storm drains to the beaches. It is therefore in the public interest to ensure that both public and private drainage systems are properly maintained, in order to facilitate the proper functioning of the City's storm and surface water drainage system, and to prevent pollutants from entering Santa Monica Bay.

(c) The City of Santa Monica is a co-permittee under the Los Angeles County National Pollutant Discharge Elimination System (NPDES) Municipal Permit and as such is obligated to implement Best Management Practice ("BMP") procedures to prevent and control the entry of pollutants and nonstorm water runoff into the City storm drain system.

(d) The most significant pollutants in urban runoff come from particulates and oil and grease.

(e) In order to better control the quantity and quality of urban runoff pollution, an active program requiring existing properties to adopt "good housekeeping" practices is essential.

(f) In order to reduce runoff contamination and runoff volume from private and publicly owned properties which will be newly developed, substantially rehabilitated or redeveloped in the future, a program ensuring that new developments incorporate design elements which facilitate such control is required.

(g) It is in the best interest of the City to establish guidelines and procedures for control of the quality of storm drainage runoff from construction sites within the City. (Prior code § 7280; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.020 Purpose.

The purpose of this Chapter is to permanently modify the structural causes of urban runoff pollution. The objectives of this Chapter include the reduction of both runoff volume and runoff contamination from existing residential and nonresidential properties and from future developments. This Chapter has two main goals. First, it aims to ensure that project sites maximize on-site percolation of runoff and/or have the capacity to convey or store peak runoff from a storm and release it at a slow rate so as to minimize the peak discharge into storm drains. Second, this Chapter aims to ensure that rain water is directed or contained so as not to become polluted by passage through contaminating material. (Prior code § 7281; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.030 Definitions.

The following words and phrases shall have the following meanings when used in this Chapter:

(a) **Area Susceptible to Runoff.** Any nonpermeable surface directly exposed to precipitation or in the path of runoff caused by precipitation which leads directly to neighboring properties or to the street.

(b) **Best Management Practices ("BMP").** Practices principally applicable to construction sites, parking lots and new developments which reduce the toxicity contained in, and the volume of, water which runs into storm drains, treatment facilities and the Santa Monica Bay.

(c) **Good Housekeeping Requirements ("GHR").** Storm water pollution control practices applicable to existing properties which have been demonstrated to significantly reduce and control storm water urban runoff pollution which runs into storm drains, treatment facilities and the Santa Monica Bay.

(d) **New Development.** For purposes of this Chapter, new development shall be defined as an increase of fifty percent or greater in the size of a single-family home, addition of one or more dwelling units in a multifamily structure, or improvements to a nonresidential property which are valued at fifty percent or more of the value of the existing improvements on the site.

(e) **Projected Runoff.** A numerical projection based on the following formula:

Precipitation multiplied by parcel size multiplied by imperviousness factor

Precipitation shall be presumed in all cases to be one inch of rainfall falling within a twenty-four-hour period. Parcel size shall be the total square footage of the lot being developed. An imperviousness factor represents the amount of average storm water drainage from the average of all parcels zoned for a particular land use.

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This numerical projection shall be used as a starting point in measuring compliance with the twenty percent urban runoff reduction required by this Chapter.

Table 7.10.030 contains imperviousness factors for different land use types. This table is derived from a more extensive list of imperviousness factors utilized by the Los Angeles County Department of Public Works — Stormwater Management Division, for benefit assessment districts for flood control.

(f) **Reduced Runoff.** A numerical projection based on the following formula:

Projected runoff multiplied by .80

This projection represents the maximum amount of storm water drainage expected to occur at a particular site upon implementation of an approved Urban Runoff Mitigation Plan.

(g) **Urban Runoff or Urban Runoff Pollution.** Water and suspended or dissolved materials deposited on surfaces and washed by storms or other sources of flowing water, through the flood control system to the ocean. Research studies have shown that urban runoff contributes many pollutants to receiving waters. Contamination includes bacteria and viruses, solid waste, and toxics such as heavy metals and petroleum-based compounds.

(h) **Urban Runoff Mitigation Plan.** A plan which shall be required to be approved in connection with any new development. Any such plan shall achieve twenty percent reduction of the projected runoff for the site. (Prior code § 7282; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.040 Good housekeeping requirements for reduction of urban runoff at existing properties.

The following good housekeeping requirements shall be adhered to by all persons within the City of Santa Monica.

(a) **Collection, Storage and Minimization of Runoff.**

(1) Water used for irrigation purposes shall not be allowed to run off of a site. In addition, washing down of paved areas shall be prohibited unless necessary for health or safety purposes and not in violation of any other provision of this Code.

(2) The uncovered outdoor storage of unsealed containers of building materials containing hazardous substances is prohibited in areas susceptible to runoff.

(b) **Maintenance of Equipment.**

(1) Objects such as vehicle motor parts containing grease, oil or other hazardous substances, and unsealed receptacles containing hazardous materials, shall not be stored in areas susceptible to runoff.

(2) Any machine which is to be repaired or maintained in an uncovered outdoor area shall be placed on a pad of absorbent material to contain leaks, spills or small discharges.

(3) Machinery and equipment, including motor vehicles, which are leaking significant amounts of oil or fluid must be repaired.

(c) **Removal of Debris and Residue.**

(1) All parking lots susceptible to runoff used for motor vehicle parking shall be swept, at minimum, on a monthly basis to remove debris. Lots with more than ten parking spaces and all public parking facilities shall be vacuum swept, at minimum, on a quarterly basis, to remove chemical residue. However, lots are not required to be vacuum swept for one month following a day when precipitation of one-half inch or more occurs.

(2) Fuel and chemical residue or other types of potentially harmful material, such as animal waste, garbage or batteries, which is located in an area susceptible to runoff, shall be removed immediately and disposed of properly. Household hazardous waste may be disposed of at the City's household hazardous waste collection facility or at any other appropriate disposal site and shall not be placed in a trash container.

(3) Intentional disposal of landscape debris into a storm drain is prohibited. Section 5.20.040 of the Santa Monica Municipal Code prohibits discharge of other types of pollutants into the storm drain.

(d) **Prohibition on Use of Pesticides and Fungicides Banned from Manufacture.** Use of any pesticide, herbicide or fungicide, the manufacture of which has been either voluntarily discontinued or prohibited by the Environmental Protection Agency, is prohibited. Those substances include any contained on the list below:

Banned Substances

- Aldrin
- BHC
- Biothional
- Captafol
- Carbon Tetrachloride
- Chloranil
- Chlordane
- Chlordimeform
- Copper Arsenate (Basic)
- Cyhexatin
- DBCP
- DDD (TDE)
- DDT
- Dieldrin
- Dinoseb
- EDBC's
  - Zineb, Wabam
- Endrin
- EPN
- Fluoroacetamide
- Heptachlor
- Monocrotophos
- OMPA
- Phenarazine Chloride
- PCB's
- PCT's
- Safrole
- Silvex/ 2, 4, 5-T
- Sodium Monofluoracetate
- Strobane
- 2, 4, 5-TCP and its salts

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Table 7.10.030

Land Use	Area Breakdown	Imperviousness Factor
Residential		
Single	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Condominium, condominium conversion	Up to 0.3257 acre	0.8194
	Area in excess of 0.3257 acre	0.0190
Planned residential development	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Cooperative	Up to 0.3257 acre	0.8194
	Area in excess of 0.3257 acre	0.0190
Double, duplex or two-unit	Up to 0.6514 acre	0.4176
	Area in excess of 0.6514 acre	0.0190
Three-unit (any combination)	Up to 0.9771 acre	0.6815
	Area in excess of 0.9771 acre	0.0190
Four-unit (any combination)	Up to 1.3028 acre	0.8194
	Area in excess of 1.3028 acre	0.0190
Five or more units or apartments	All lot areas	0.8553
Modular homes	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Mobilehomes	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Rooming houses	All lot areas	0.6815
Mobilehome parks	All lot areas	0.8194
Commercial		
Stores	All lot areas	0.9086
Store combinations	All lot areas	0.9086
Department stores	All lot areas	0.9850
Supermarkets	All lot areas	0.9762
Shopping centers (neighborhood)	All lot areas	0.9578
Shopping centers (regional).	All lot areas	0.9461
Office buildings	All lot areas	0.9086
Hotels and motels	All lot areas	0.9578
Professional buildings	All lot areas	0.9578
Restaurants and cocktail lounges	All lot areas	0.9461
Wholesale and mfg outlets	All lot areas	0.9086
Banks and savings & loans	All lot areas	0.9578
Service shops	All lot areas	0.9461

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Table 7.10.030 (Continued)

Land Use	Area Breakdown	Imperviousness Factor
Commercial (Continued)		
Service stations	All lot areas	0.9578
Auto, recreation & construction equipment sales and service	All lot areas	0.9461
Parking lots	All lot areas	0.9461
Animal kennels	All lot areas	0.9578
Nurseries or greenhouses	Up to 0.4136 acre	0.4733
	Area in excess of 0.4136 acre	0.0190
Industrial		
Light mfg	All lot areas	0.9086
Heavy mfg	All lot areas	0.9086
Warehousing distribution and storage	All lot areas	0.9086
Food processing plants	All lot areas	0.9578
Motion picture & radio/TV industries	All lot areas	0.8194
Lumber yards	All lot areas	0.9578
Mineral processing	All lot areas	0.4733
Parking lots	All lot areas	0.9086
Open storage	All lot areas	0.6551
Recreation and Entertainment		
Theaters	All lot areas	0.9086
Bowling alleys	All lot areas	0.9850
Clubs, lodge halls, fraternal organizations	All lot areas	0.9086
Athletic and amusement facilities	All lot areas	0.6551
Skating rinks	All lot areas	0.4733
Institutional		
Churches	All lot areas	0.8194
Schools	All lot areas	0.8194
Colleges and universities	All lot areas	0.4733
Hospitals	All lot areas	0.7435
Homes for aged and others	All lot areas	0.6815
Cemeteries	All lot areas	0.0000
Vacant	All lot areas	0.0190

Thallium Sulfate
TOK
Toxaphene
TBT
Lead Arsenate
Calcium Arsenate
Pentachlorophenal
Creosote

(Prior code § 7283; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.050 Penalties for failure to comply with good housekeeping requirements.

(a) The Director of the Department of General Services, or his or her designee, is authorized to enforce Section 7.10.040 as follows:

(1) For the first failure to comply with any provision of Section 7.10.040, the Department of General Services shall issue to the affected person a written notice which includes the following information:

(i) A statement specifying the violation committed;

(ii) A specified time period within which the affected person must correct the failure or file a written notice disputing the notice of failure to comply;

(iii) A statement of the penalty for continued noncompliance.

(2) For each subsequent failure to comply with any provision of Section 7.10.040 following written notice pursuant to this Section, the Director of the Department of General Services may levy a penalty of one hundred dollars. Any statement informing a violator of a citation shall include a notice setting forth the hearing rights provided in subsection (a)(3) below.

(3) Any person assessed a penalty pursuant to subsection (a)(2) may dispute the penalty by requesting a hearing on a form provided by the City within the time and manner set forth in Section 6.16.030, provided that no hearing request shall be deemed timely filed and no hearing shall be held unless, within the time period to request a hearing, the person deposits with the City Treasurer money in the amount of any unpaid penalty due under this Section. If as a result of the hearing it is determined that the penalty was wrongly assessed, the City shall refund any money deposited to the person. The decision of the Hearing Examiner shall be final except for judicial review and shall not be appealable to the City Council.

(4) It shall not be a defense to the assessment of any penalty or to any other civil enforcement action provided for under this Section for a person to assert that any violation of Section 7.10.040 was caused by the actions of a person other than the person assessed except if the violation was caused by the criminal or negligent action of a person who was not an agent, servant, employee or family member of the person.

(5) Any penalty collected hereunder shall be deposited in the Urban Runoff Fund to be used as reimbursement for the Department of General Services' costs and expenses of administration and enforcement of this Chapter.

(b) The violation of this Chapter shall constitute an infraction punishable by a fine of one hundred dollars. Each day that a violation occurs shall constitute a separate offense.

(c) A violation of any provision of this Chapter is declared to be a public nuisance and the City Attorney is authorized to abate such violation(s) by means of a civil action.

(d) The penalties and remedies established by this Chapter shall be cumulative. (Prior code § 7284; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.060 Urban runoff reduction requirements for new development.

The following urban runoff reduction requirements shall apply to all persons submitting applications for new development within the City of Santa Monica.

(a) At the time of submittal of an application for the first planning approval for a new development project, an applicant shall be required to submit an Urban Runoff Mitigation Plan to the Department of General Services.

(b) In developing an Urban Runoff Mitigation Plan, a developer shall reduce projected runoff for a project by at least twenty percent through incorporation of design elements or principles which address each of the goals set forth below as subdivisions (1), (2) and (3) of this subsection. The design elements utilized by a developer may, but are not required to, include those provided on the list below, with the exception of subsection (b)(3)(i) which is required where applicable. Although design elements are set forth as if they address only one goal, in many cases they address more than one and can be used to address multiple goals in achieving the reduced runoff to be achieved by the mitigation plan:

(1) Increase permeable areas:

(i) Maximize the percentage of permeable surfaces and green space to allow more percolation of runoff into the ground. The use of porous materials for or near walkways will increase the amount of runoff seepage into the ground,

(ii) Use natural drainage, detention ponds or infiltration pits so that runoff may collect and seep into the ground and reduce or prevent off-site flows,

(iii) Divert and catch runoff through the use of swales, berms, green strip filters, gravel beds and french drains,

(iv) Construct driveways and walkways from porous materials to allow increased percolation of runoff into the ground;

(2) Minimize the amount of runoff directed to impermeable areas and/or maximize storm water storage for reuse:

(i) Install rain gutters and orient them towards permeable surfaces rather than driveways or nonpermeable surfaces so that runoff will penetrate into the ground instead of flowing off-site,

(ii) Modify grades of property to divert flow to permeable areas and to minimize the amount of storm water leaving the property,

(iii) Use sediment traps to intercept runoff from drainage areas and hold or slowly release the runoff, with sediments held in the trap for later removal,

(iv) Use retention structures or design rooftops to store runoff. Utilize subsurface areas for storm runoff either

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for reuse or to enable release of runoff at predetermined times or rates to minimize the peak discharge into storm drains. Cisterns are also a possible storage mechanism for reuse,

(v) Design curbs, berms or the like so as to avoid isolation of permeable or landscaped areas;

(3) Reduce parking lot pollution:

(i) All parking lots are required to have the capability to contain one inch of precipitation in a twenty-four-hour period. Options to meet this requirement include use of green strip filters and porous pavement to capture and percolate runoff where possible, and use of oil and water separators or clarifiers to remove petroleum-based contaminants and other pollutants which are likely to accumulate,

(ii) Direct runoff toward permeable areas and away from pollutant laden areas such as parking lots,

(iii) Construct parking lots from porous materials.

(c) The City's evaluation of each Urban Runoff Mitigation Plan will ascertain how well the proposed plan meets the combined objectives set forth in subsection (b) above. Each plan will be evaluated on its own merits according to the particular characteristics of the project and the site to be developed.

(d) The Director of the Department of General Services shall approve or disapprove the plan within fourteen calendar days of submittal. If the plan is disapproved, the reasons for disapproval shall be given in writing to the developer. Any plan disapproved by the Director of General Services or his or her designee must be revised by the developer and resubmitted for approval. A resubmitted plan will be approved or disapproved within fourteen calendar days of submittal. No building permit shall be issued until an Urban Runoff Mitigation Plan has been approved by the Department of General Services.

(e) Full or partial waivers of compliance with this Section may be obtained by persons who apply on forms supplied by the City and show that incorporation of design elements that address the objectives set forth in subsection (b) above is an economic and physical impossibility due to the particular configuration of the site or to irreconcilable conflicts with other City requirements. Requests for waivers shall be granted or denied, in writing, by a three-member board comprised of one representative each from the City's Planning Division, General Services Department, and City Manager's Office.

(f) Compliance with an approved Urban Runoff Mitigation Plan shall be a condition of any required planning approval. (Prior code § 7285; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.070 Urban runoff requirements for projects under construction.

The following Best Management Practices which address the problem of urban runoff shall apply to all projects undergoing construction in the City. The Best Management Practices list set forth below is required by the City. The requirements set forth below shall apply at the time of demolition of an existing structure or commencement of construction and until receipt of a certificate of occupancy:

(a) Runoff, sediment and construction waste from construction sites and parking areas shall not leave the site;

(b) Any sediments or other materials which are tracked off the site shall be removed the same day as they are tracked off the site. Where determined necessary by the Building Official or his or her designated representative, a temporary sediment barrier shall be installed;

(c) On an emergency basis only, plastic covering may be utilized to prevent erosion of an otherwise unprotected area, along with runoff devices to intercept and safely convey the runoff;

(d) Excavated soil shall be located on the site in a manner that eliminates the possibility of sediments running into the street or adjoining properties. Soil piles shall be covered until the soil is either used or removed;

(e) No washing of construction or other industrial vehicles shall be allowed adjacent to a construction site. No runoff from washing vehicles on a construction site is allowed to leave the site;

(f) Drainage controls shall be utilized as needed, depending on the extent of proposed grading and topography of the site, including but not limited to the following:

(1) Detention ponds, sediment ponds, or infiltration pits,

(2) Dikes, filter berms or ditches,

(3) Downdrains, chutes or flumes. (Prior code § 7286; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.080 Citywide urban runoff pollution education program.

The Department of General Services, along with other City Departments, shall conduct an informational program to educate the public about the dangers of urban runoff pollution and the means of controlling such pollution. The program shall educate residents and business persons who operate within the City about the contents of this Chapter prior to its effective date. (Prior code § 7287; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.090 Annual evaluation and revision of good housekeeping requirements, best management practices and construction requirements.

In recognition of the newness of regulation in the area of urban runoff pollution, the effectiveness of this Chapter shall be evaluated in writing by the General Services Department not later than one year from the effective date, and no less frequently than once every two years thereafter. The written evaluation should address the necessity for revisions of the process established by this Chapter for achieving urban runoff reduction and the necessity for revisions to good housekeeping requirements, best management practices and construction requirements, if any. (Prior code § 7288; added by Ord. No. 1642CCS, adopted 9/8/92)

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Storm Water: Asset or Liability

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Introduction

It is ironic that modern cities tend to shunt away the rain that falls on them while they import fresh water from distant streams and reservoirs.

-- Ferguson and Debo 1990

It has long been the public perception that stormwater in an urban setting is a liability and large flood control structures should be built to protect the public. Thus, public agencies have designed and constructed flood control facilities with one primary objective: protection of the public. While this is the most important objective of stormwater management, there is another side of stormwater management that has been relatively ignored — viewing stormwater runoff as an asset for use in replenishing aquifers and other non-flood control uses (recreation, wildlife enhancement). To view stormwater as a multi-use resource, a comprehensive stormwater management plan is required that accounts for the physical characteristics and constraints of the watershed.

The development of a comprehensive stormwater management plan for a watershed requires that the underlying hydrology of the watershed, both on the surface and underground, be completely understood. The driving forces in the hydrologic cycle are precipitation, infiltration, and evaporation. In the Southern California area, the majority of precipitation occurs in the winter months (i.e., December through March). In addition, there is tremendous spatial variability of precipitation in the Los Angeles basin. In the mountains surrounding Los Angeles, the total annual precipitation is two to three times greater than the precipitation in the coastal plain. The Los Angeles - San Gabriel Rivers drainage basin covers 1,460 square miles, from the San Gabriel Mountains to the Pacific Ocean (Figure 1).

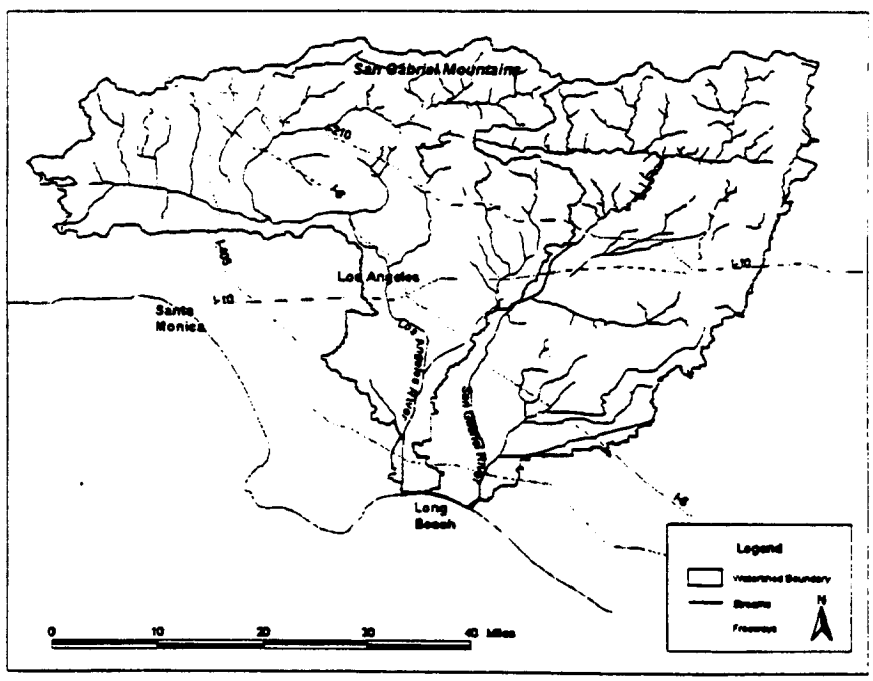

Figure 1: The Los Angeles-San Gabriel Rivers drainage basin.

In response to damages from the flood in 1934, the U.S Army Corps of Engineers in partnership with Los Angeles County Flood Control District (the County) began construction of a comprehensive flood control system consisting of detention/retention basins, channel improvements, pumping plants, and local storm drains. With minor exceptions, the river channels are concrete lined trapezoidal channels, entrenched in the upper reaches and controlled by levees and rip-rap in the lower reaches. The system was designed to serve a projected population of three million with much of the upper watershed (i.e., San Fernando Valley) to remain largely agricultural land.

In the past 50 to 60 years, there has been extensive development in the Los Angeles - San Gabriel Rivers watershed which has created a vast amount of impervious surface areas due to buildings, roads, driveways, parking lots and sidewalks. This has substantially changed the hydrology and runoff processes in the watershed. Studies have shown that runoff in an area of 75-100 % impermeable cover increases by a factor of nine when compared to an area with natural cover. In the Los Angeles - San Gabriel rivers basin, the storm drain system that was originally designed to convey the 100-year storm, now only provides 25 to 40 year protection in some portions. The large amount of impervious space in the watershed has increased the volume of runoff, and the timing of the peak flow rate is much faster than before.

The increase in runoff due to urbanization is clearly seen in Figure 2, which presents the ratio of runoff to precipitation for the Los Angeles River watershed. From the 1930s to the mid 1960s, the percentage of rainfall that infiltrated into the ground or evaporated was more than 80% (20% of the rainfall was converted into runoff). Since the mid 1960s, this ratio has steadily decreased and now approximately 50% of the rainfall is infiltrated or evaporated and the other 50% is runoff which goes to the ocean.

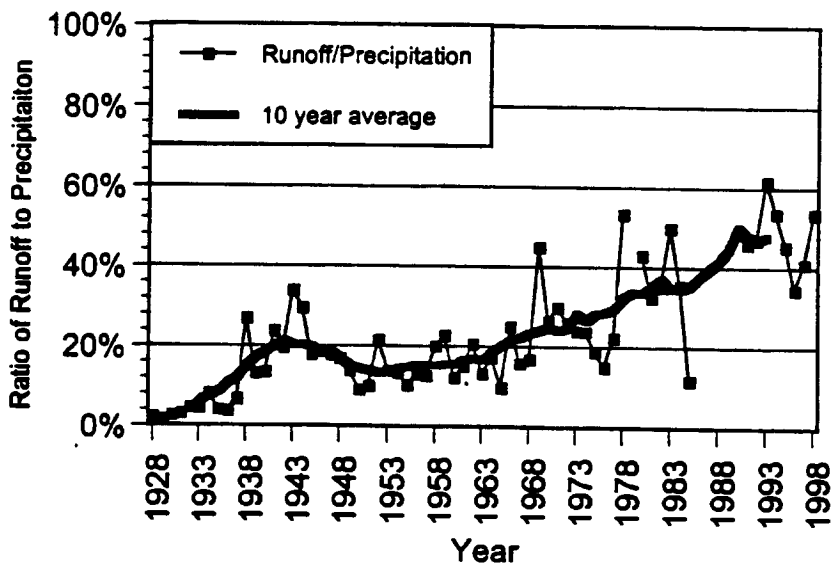

Figure 2: The ratio of annual runoff in the Los Angeles River at Firestone Blvd. to the annual precipitation at the Los Angeles Civic Center from 1928 to 1998.

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There is a growing realization that the traditional approaches to stormwater management have not always worked well and in some instances the engineered solution made the situation worse. The flooding in the Mississippi River basin in 1993 forced some communities to move out of the floodplain to higher ground. Furthermore, the flood crests at St. Louis were up to 3 meters higher than a flood from an earlier storm of the same magnitude because of the constricting effect of the upstream levees. In 1986, flooding in Sacramento was due in part to errors in the operation of the Folsom Dam which is a major-flood control reservoir upstream of Sacramento. [1]

This paper reviews traditional and non-traditional approaches to stormwater management and explores some potential opportunities for alternative stormwater management techniques in the Los Angeles - San Gabriel Rivers watershed. This approach to stormwater management views stormwater as an potential asset, while at the same time keeping protection from the liability of stormwater as a primary objective. The focus of this paper is the reduction of total volume and velocity of stormwater entering the drainage systems, primarily through techniques that capture or slow runoff at its source.

Traditional Approaches: Conveyance and Storage

Because natural drainage and storage processes have been altered by urbanization, stormwater management systems attempt to compensate for increased runoff and decreased infiltration and act as substitute for the role of the natural floodplain. The traditional design of stormwater systems has focused on using conveyance and storage facilities to control the runoff during a major storm event (based on historical rainfall or runoff). The traditional flood control system consists of engineered structures such as a network of curbs, gutters, underground pipes, and open channels. Since the 1970s, there has been a trend to incorporate storage facilities (detention and retention basins) into the system that detain or retain the storm runoff, releasing it at a controlled rate into the conveyance system[2].

This approach to stormwater management considers stormwater to be a liability that is best gotten rid of as efficiently as possible in channels that use the minimum amount of space. This has worked well in many instances and has met the primary objective of the flood control system -- protection of property from storm runoff. These facilities, however, were designed for a single purpose (flood control) and only incorporated other benefits (e.g., recreational, environmental, water conservation) that were feasible for their location.

The design criteria for these traditional stormwater systems varies depending on the magnitude of the "design storm" (the maximum rainfall event that the system should be capable of managing), the size of the facility, and the community's desire for a high level of flood protection. In Los Angeles County, if the watershed area of the drainage facility is greater than 100 acres or a natural watercourse, then the system is designed for a 50-year storm event. Otherwise, in urban areas, the combination of street capacity and storm drains is to afford a 25-year level of protection. Lastly, the Federal Emergency Management Agency (FEMA) Flood Insurance program requires that all communities have 100-year flood protection. In developed areas, all finished floor elevations of proposed habitable structures must equal or exceed the water surface of the predicted 100-year flood. These design criteria

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may seem to be conflicting; however, the County criteria is applicable to local storm drain facilities and the FEMA criteria applies to regional facilities, such as the Los Angeles River.

Conveyance Facilities

Conveyance facilities are designed to move water on or below the surface through a series of gutters, catch basins, pipes, and open channels. This is the oldest, most efficient, and most common approach to stormwater management. The components in the system are designed to move the water as quickly as possible and without obstruction[3]. The facilities were often designed to not allow water to infiltrate into the soil due to limited space requirements and incompatible soil characteristics. Furthermore, the facilities are engineered to minimize the amount of space required to convey the water. Thus, the facilities are economical and are hydraulically efficient -- minimal width of the channel and minimal roughness.

Flow velocity is a function of the size of the channel, the slope, and the roughness of the channel surface area. The impact of channel roughness on the flow capacity of a channel is demonstrated in Figure 3. The capacity of the channel is inversely proportional to the roughness of the channel. Thus for a given channel width, if the capacity of a concrete-lined channel is 10,000 cubic feet per second (cfs), then the capacity of a grass-lined channel with the same dimensions is 4,000 cfs. The smooth, concrete-lined channel might be adequate to meet the flood control needs of the community; however, it often limits uses during dry periods. A grass-lined channel would have to be larger in size to provide the same level of flood protection. A grass-lined channel that is the same size as the concrete channel would only partially meet the flood control needs of a community, but it could be a multipurpose facility that could be used for other activities during dry periods.

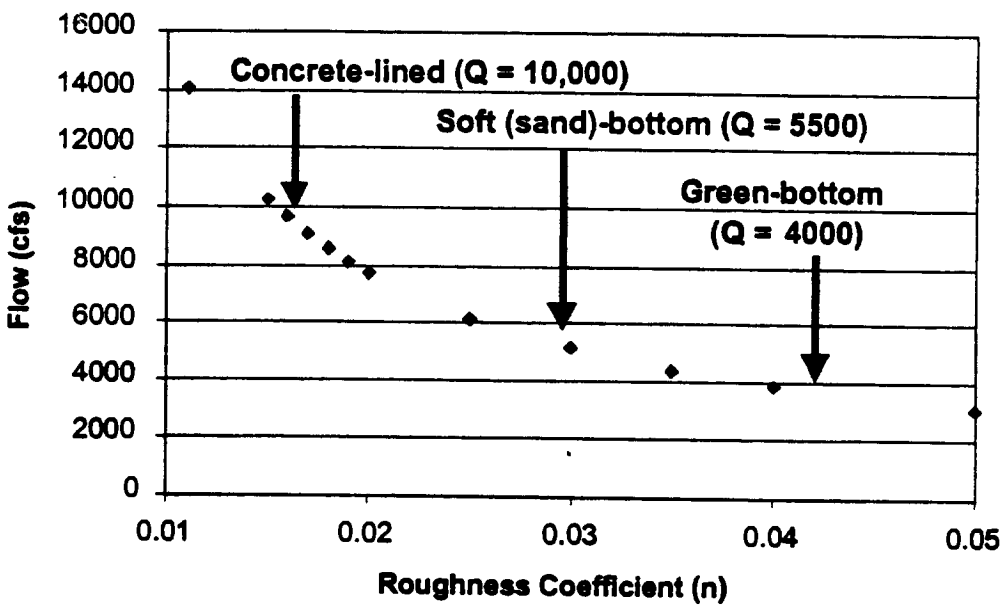

Figure 3: The effect of channel roughness on the channel capacity for a hypothetical trapezoidal channel. The x-axis is the Manning's roughness coefficient (n).

Detention Basins

The function of a detention basin in a flood control system is to reduce the peak runoff that occurs during major rainfall events, but the total storm volume conveyed by the system remains unchanged. Figure 4 demonstrates the impact of a detention basin on the magnitude of the peak runoff and the change in the hydrograph (amount of runoff over time). The peak flow rate is substantially reduced and the shaded area in Figure 4 is the amount of runoff volume that is detained in the basin.

Detention basins can be "wet" basins that have additional capacity reserved for detention of storm runoff or "dry" basins that use all of the capacity to detain storm runoff. The wet basins are typically multipurpose facilities that are used for recreational activities when flood risk is not imminent and liability related to the public use is minimal.

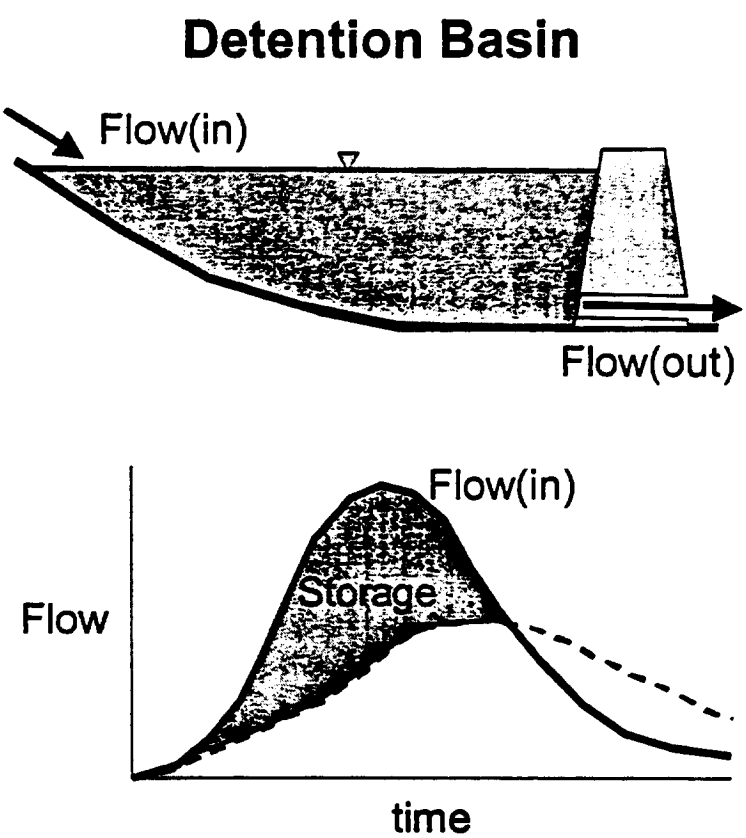

Figure 4: The impact of a detention basin on a storm hydrograph. The flow into the detention basin is the solid line and the flow out of the basin is the dashed line.

Retention or Infiltration Basins

The other type of stormwater basin used in flood control systems is a retention or infiltration basin. This type of basin reduces the total volume of storm runoff by allowing a portion of the runoff to infiltrate and recharge the groundwater. The infiltration of stormwater collected in the basins also restores the baseflow in streams and filters pollutants out of the stormwater[4].

Retention basins can be designed directly in the flow path of the channel or the basin can be "off line" where flows are diverted out of the main flood control channel. The stormwater in a retention basin does not return to the downstream channel or waterway.

Non-traditional Approaches: Reducing Volume and Velocity

Rethinking Traditional Approaches

There are a number of reasons to reevaluate approaches to stormwater management: water conservation, environmental concerns, desire for more open space, costs, and increasing awareness of the indirect impacts of traditional systems. Single purpose conveyance systems are increasingly viewed as throwing water away. They typically do not address other watershed management concerns such as water quality, channel erosion, ground water recharge or reclamation of surface runoff. Channelization disrupts the local water balance and the natural functions and habitat of a stream[5].

The primary focus of stormwater systems has been the need for flood control and public safety. Flood control and stormwater management are still evolving sciences, yet the infrastructure isn't always adaptable to new research findings. Traditional conveyance methods merely allow the flood to move elsewhere at a faster rate; they do not reduce the volume of water. Traditional designs may not handle the intended volume for several reasons. For example, designs based on water moving at maximum velocity through the channel don't adequately consider the effect of the movement of sediment and debris through the channel during high flows, which changes the nature of the flow[6]. Channels require costly maintenance to clear vegetation and debris that reduce the capacity and impede flow. There may also be inadequate provisions for storm discharges that exceed the design capacity of the system, and since the urban floodplains are occupied this puts more people and property at risk[7]. As our urban population increases, so do pressures on the existing stormwater system. Reducing the volume and velocity of stormwater becomes an important and cost-effective alternative to reducing risk and extending the viability of existing regional stormwater systems.

One concept that is introduced in newer approaches to stormwater management is the idea that smaller storms that are more frequent are significant and should be evaluated when developing a stormwater management plan. Table 1 summarizes the rainfall amounts for 24-hour storms with return periods ranging from 1 year to 100 years. On average, a 24-hour rainfall amount of 2.46 inches is experienced once every two years and a 24-hour rainfall amount of 5.32 inches occurs once every 100 years. The 100-year rainfall amounts are used for design of flood control facilities; however, the lower frequency storms should also be considered in stormwater management plans. The typical 24-hour rainfall amounts are shown in Figure 5 for the 31 days of rain that the Los Angeles Civic Center experiences on average each year. Of these 31 storms, 15 have rainfall amounts less than 0.25 inches (Figure 5). Depending on the soil type and prior soil saturation, this amount of precipitation may be infiltrated in areas that have a pervious surface. Thus, one of the aims of a comprehensive stormwater management plan should be to minimize the amount of impervious land cover. This would increase opportunities for infiltration of rainfall, groundwater recharge and the

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reduction of overall runoff volume and velocity. Following are a few approaches that help to accomplish these goals.

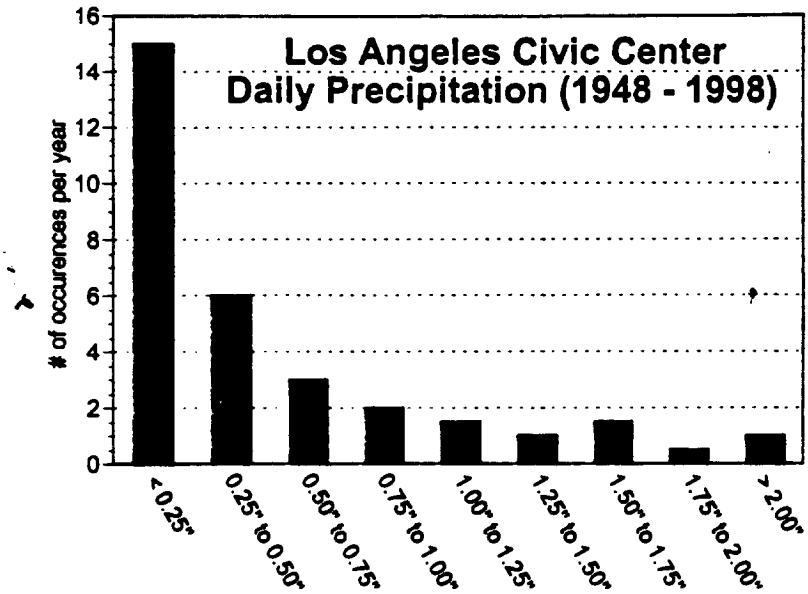

Figure 5: The typical amounts of daily rainfall for an average year at the Los Angeles Civic Center based on data from 1948 to 1998.

Return Period (years)	Rainfall Amount (inches)
1	1.77
2	2.46
3	2.73
4	2.92
5	3.06
10	3.52
25	4.18
50	4.72
100	5.32

Table 1: Los Angeles Civic Center 24 Hour Precipitation for various return periods based on data from 1948-1998.

Channel Design and Operation
As discussed earlier, the size and roughness of a channel dramatically impacts the velocity of the flow. Wider channels, which provide a greater cross-sectional flow area, will slow runoff velocity[8]. In unlined channels, reducing velocity also increases infiltration, thus reducing the total channel discharge.

Another means of retaining flows in the channel is the construction of temporary dams, constructed of inflatable rubber tubing or rocks and logs. These small dams slow the velocity of the flow and allow water to pool behind them. If properly designed, the larger flood flows will safely flow over the dam without increasing the upstream flooding. When rubber dams are used in the channel, they can be inflated only when low to moderate flows are in the channel. The rubber dams can be deflated when large flows are expected, to maximize the capacity of the channel for flood control purposes.

Water Harvesting
Runoff water is detained in permanent ponds or wetlands and may be pumped from detention basins into irrigation systems, stored in tanks for fire hydrant systems, or, for smaller areas such as roofs, diverted directly into landscaped areas[9]. This is an old practice only recently rediscovered for urban use. This is a different way of looking at runoff: it directs runoff toward points of use rather than diverting runoff away from areas it could damage.

On-site Infiltration Facilities
Increasing infiltration restores a measure of the natural hydrologic cycle by returning water to the soil and reducing runoff volumes inflated by urbanization. These facilities include grass berms, drains, and subsurface percolation basins that collect and detain water on-site and allow it to infiltrate into the soil. These methods work well if soil conditions are appropriate to allow drainage and the site can be properly graded.

Cisterns or dry wells are also useful where open space and runoff volumes are limited. These facilities capture runoff from rooftops for infiltration or reuse. A dry well is a hole in the ground lined on the sides with permeable material that will hold the soil in place, and filled with coarse gravel. It must be located a sufficient distance from the building to prevent saturation of the soil under the foundation, generally at least ten feet. If designed and sized appropriately, dry wells work very well over time. A cistern is a container usually set above ground, with an outlet valve that allows it to operate in a manner similar to a detention basin. Cisterns must be covered to prevent mosquitoes from breeding and to keep out debris, and must either have a small opening or be secured to prevent access by children. To maintain capacity, the cistern must be cleaned of sediments periodically[10].

Percolation basins can be used to capture runoff from roof gutters, walkways, and for larger areas such as parking lots. Perforated pipe is laid in an excavated area, covered with a layer of gravel to provide stability, then paved or covered with soil. The drainage system directs water into the pipes, which is then allowed to infiltrate into the ground. If pollution levels are high and underlying soil conditions insufficient to filter out pollutants, water can be retained in these basins and released slowly into storm drain systems after the peak stormflow has passed.

Rooftop storage allows water to be trapped and either slowly evaporated or harvested for other uses, such as landscape irrigation or groundwater recharge. Rooftop detention basins can be part of the design in new developments, or added to existing buildings provided the roof is flat and the building capable of handling the additional weight. Existing buildings can be retrofitted by increasing the size of the rain gutters, and directing downspouts into cisterns or infiltration basins[11].

Permeable Pavements

Permeable paving can be a porous concrete surface or a type of structural support for a gravel or landscaped surface. It facilitates runoff capture and infiltration by increasing the void space in the surface and subsurface material. These surfaces have been in use since the early 1970s and are widely used in Europe and Japan. Two general types of commercial porous pavement surfaces have been developed: semi-permeable and fully permeable.

Semi-permeable surfaces have a coarse surface containing about 25% void space bonded to an impermeable underlayer. They were developed originally for airport runways to improve traction, and have been used for road surfacing as well (and have been used successfully by Caltrans). The surface tends to compact, reducing its permeability somewhat, but stabilizing at about 15% void space after two years use. Studies in Britain[12] found that the surface could potentially absorb up to 7.5 mm of rainfall when new, reducing to about 4mm over time. This storage capacity would be adequate for many typical Southern California storms, and would reduce the volume of runoff during larger storms.

Fully permeable surfaces, which have a permeable underlayer, establish a more natural runoff condition by allowing rainfall to percolate to the water table. Although they have less cohesive strength than regular pavement, they are adequate for surfacing parking lots, playgrounds and walkways. These surfaces can absorb anywhere from 5 to 25 inches of water per hour, depending on the composition of the subsurface material[13]. Porous pavement can also be used in combination with a subsurface infiltration system, such as a permeable asphalt surface on top of a gravel or stone dry well or over perforated pipe. This surface may also have some weight and traffic limitations, although some of the newer plastic systems are extremely durable and structurally stable, enough to withstand use by heavy emergency vehicles. The infiltration rates on these combined systems are only rarely exceeded, even after a succession of storms.

Permeable surface types called open-cell pavers or "grasscrete" combine a concrete or plastic grid with soil fill and grass cover. The grid provides the stability and structure, the grass traps runoff, and the soil allows infiltration. Concrete-based grasscretes are about 60% permeable, but the newer polyethylene-based surfaces provide up to 98% open surface area. Although structurally sound, these surfaces are best used for walkways or infrequent parking so that sufficient sunlight can reach the grass. Grasscrete is in use on the UCLA campus at the Anderson School of Management building along the south walkway, providing a transport route for emergency vehicles.

Porous pavements can be as simple as cinder blocks laid end to end with the holes packed with gravel, or brick laid without mortar. These types of surfaces are not structurally suitable for anything heavier than foot traffic, and are fairly high maintenance. Depending on the type, permeable pavements can be more expensive than standard concrete or asphalt paving and require more manual labor to install and maintain. However, when the costs of the storm drainage system are added to that of conventional pavement, costs for porous surfaces become very competitive.

Grass Swales and Filter Strips

Swales and filter strips are shallow depressions or open drainage areas planted with grass or other vegetation, into which runoff is directed. They are used in highway medians, parks, homes, parking lots and many other landscaped or open space areas. Swales and strips are comparable in cost and maintenance requirements to traditional landscaping, and have the added benefits of trapping sediments and filtering pollutants[14]. The vegetation helps reduce runoff speed and absorbs rainfall.

Considerations for Implementation

Many of the approaches described above are primarily designed to reduce runoff volume by increasing infiltration rates. The success of these methods depends largely on the intensity of a given storm and the characteristics of the site: depth to groundwater, soil water holding capacity, infiltration rates, and antecedent soil moisture. Many of these techniques also trap pollutants during infiltration. EPA studies have found that if there is sufficient clearance to the water table, many of the pollutants will be removed by the soil during percolation, causing no adverse impacts on groundwater[15]. If pollutant levels are sufficiently high, for example in industrial areas, infiltration should be implemented with some pretreatment measures, such as bordering permeable surfaces with vegetation to intercept some of the pollutants[16]. In swales and infiltration basins that are planted with grass or other cover crops, incorporation of sand or peat filtration may offer a simple solution to treating runoff. Peat filters form a subsurface layer under the vegetation soil-bed: a 6-12 inch layer of peat for absorption over a sand-gravel layer for percolation. Peat can absorb many times its weight in oils and removes heavy metals and significant amounts of nutrients and bacteria from the water as it filters through[17].

On-site structural methods and more efficient site designs are most commonly employed in areas of new or redevelopment. Reducing runoff in existing developments tends to be more expensive than when it is designed into the project, although the feasibility and cost effectiveness of retrofitting is gaining legitimacy (see TREES example below). Providing groundwater recharge and diverting runoff for irrigation also reduces the need for imported water, another cost savings that is often overlooked.

Management Approaches

The so-called "non-structural" methods refer to more integrated approaches to watershed management, not to specific engineering solutions. They can take the form of planning procedures, floodplain zoning regulations, local ordinances, and design standards that encourage or require reduction of runoff through various techniques. They can apply to existing development and heavily developed floodplains, as well as to future development.

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As watershed management concepts gain attention, public agencies and communities are recognizing the potential of stormwater management systems as multi-purpose projects, not just for drainage but for recreation and riparian habitat. For example, detention basins may be used for golf courses or parks, and bicycle or equestrian trails can be added alongside stream channels. Many of the County's facilities already provide such multiple uses. However, a watershed approach to volume and velocity reduction would also aim to store and utilize stormwater and minimize discharges to receiving waters. It would detain more runoff in the upper reaches of the watershed by increasing vegetation cover, groundwater recharge basins and detention facilities so that peak flows are reduced downstream. Additionally, floodplain management that controls activity in areas subject to flooding through special zoning, permitting, public education and enforcement of flood insurance requirements will reduce both property damages and public risk.

Increasing vegetation and permeable space in the watershed reduces runoff by enhancing infiltration of rainwater, which also provides groundwater recharge. This is a long term strategy primarily applicable to new or redevelopment areas. For example, the City of Malibu allows a maximum of 30-45% permeable surface in the design of any new development, depending on the size of the lot, and encourages the use of permeable surfacing wherever feasible. There is also an increasing trend to require new developments to manage runoff to meet a specific target, such as capturing all runoff on-site during construction and ensuring that runoff does not increase overall after the development is completed.

Local Government Regulations

The **City of Santa Monica's Urban Runoff Mitigation Ordinance**, implemented in 1993, requires new development projects to incorporate design measures to reduce runoff by 20%, as well as control runoff during construction. Developers are required to submit an Urban Runoff Mitigation Plan prior to project approval. An evaluation of seven of the projects completed since the ordinance took effect indicates that nearly 1.1 million gallons of runoff were diverted from Santa Monica Bay over the 1994-95 winter season, an average of 31,000 gallons per storm. Overall, runoff was reduced at these sites an estimated 24%. As additional projects are proposed and subject to compliance with the ordinance, substantially more runoff diversion is anticipated.

The **City of Calabasas Urban Runoff Pollution Control** section of the city's development code incorporates regulations to reduce runoff volume and slow runoff flows by increasing infiltration. The provisions apply to any new development that includes grading, building new structures, or paving. Permit issuance is conditional upon approval of a Runoff Mitigation Plan that demonstrates runoff reduction of 20% by incorporating minimum area requirements for permeable surfaces and directing runoff to permeable areas for infiltration or to storage areas for reuse. Recommended measures include the use of porous paving for parking lots and walkways, diverting runoff to detention basins, drains or landscaped areas such as swales and grass strips for infiltration, or capturing runoff on rooftops or subsurface structures for reuse. The requirements are too new to evaluate, but Mitigation Plans received so far show a preference for the use of porous pavements because they are the easiest to install. There are considerations for the weight bearing capacity of some types of pavers

however, and the prevalence of expansive clay soils in the area limits the use of infiltration inducing measures in some situations.

Los Angeles County, as a National Pollutant Discharge Elimination System (NPDES) permit holder, is required to manage municipal stormwater discharges. The County's **Department of Public Works** has developed a program to implement the requirements of the permit, and to serve as a model for the cities that are co-permitees. The program establishes guidelines for minimum standards, monitoring compliance, education and public outreach. For new or redevelopment, the program establishes Standard Urban Storm Water Mitigation Plans, designed to minimize runoff pollutants and reduce overall runoff volume by increasing on-site retention and infiltration. Some of the suggested techniques include porous paving and other alternatives to concrete, vegetated swales and buffer strips, and extended detention basins.

Non-traditional Approaches in Action

Projects in the Los Angeles area

The **Los Angeles Unified School District** recently began implementing infrastructure improvements for its 400 schools, including playground pavement repaving. With the help of TreePeople and others, LAUSD is developing a plan to reduce paved areas by 30% throughout the schools. A number of Best Management Practices are under consideration which will provide a greener, more sustainable environment, capture runoff, and reduce air and water pollutants. A pilot project has been proposed for the Osage Elementary School in Westchester which will utilize porous pavement, additional landscaping, and facilities to capture runoff on-site for reuse as irrigation water.

Long Beach Organic, a non-profit community service organization, has been facilitating community gardening and green waste recycling on vacant lots in the greater Long Beach area since 1994[18]. They are currently securing funding for a proposed plan to divert 15,000 tons of green waste destined for landfills in Los Angeles County, to use as mulch for weed abatement, water retention, bio-filtration, and creation of compost for soil amendment. The project will cover about 27 acres of vacant property in Long Beach and Signal Hill.

One of the primary goals of the project is to measure the effects of mulch and compost on runoff and soil infiltration. Mulch cover provides insulation to retain soil moisture, reducing evaporation and soil erosion. Compost can hold up to eight times its weight in water, which would not only reduce runoff but provide increased infiltration time. This project is scheduled to start as soon as funding is finalized, and will continue monitoring into 2001.

Sun Valley Watershed, a 2,681-acre watershed located north of downtown Los Angeles between Tujunga Wash and the Burbank Airport, experiences problems with flooding during heavy rains. The existing drainage system within the watershed is inadequate, but the cost of constructing a traditional storm drain to alleviate the flooding has been estimated to be $42 million. **Los Angeles County** is considering the possibility of alternative solutions in the watershed that would address the flooding problem while providing additional benefits to the community such as increased recreation, reduced flows and pollutant loads entering the Los Angeles River, increased water and energy conservation, and enhanced wildlife habitat.

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Any alternative project must be able to provide the same level of flood protection without adversely impacting groundwater quality in the region. Among the solutions under consideration are retrofitting existing developments and requiring new development to capture runoff onsite, use of permeable paving where feasible, and creating detention and/or retention basins to capture runoff and provide habitat and recreation during dry periods. Support for this project is high, and a stakeholder group was formed late in 1998 to evaluate the feasibility of various alternatives. It is hoped that this project will serve as a model for flood control design in other parts of Southern California.

The Transagency Resources for Environmental and Economic Sustainability (**TREES**) project was founded by **TreePeople** in 1997 with the goal of demonstrating "the economic, environmental and social benefits gained by cooperative approaches to designing our urban landscapes as functioning mini-watersheds." The implementation of more sustainable design and management measures would result in significant reductions in imported water use, in the volume and velocity of urban runoff generated, and in the amount of pollutants carried by runoff to the ocean. The initial design session brought together engineers, landscape architects and other experts to develop sustainable landscape designs for commercial, industrial, multiple and single family residential, and public sites. A design "planbook" was produced which includes prototype designs for retrofitting these different types of development. Each design includes a variety of suggestions for accomplishing a more sustainable local environment[19].

As a demonstration of some of these ideas, a home in south Los Angeles was retrofitted with drainage, runoff storage and landscaping techniques capable of capturing rainfall from a 10-inch, one-day storm. In addition, TreePeople has developed cost-benefit modeling software which allows different design scenarios to be more easily evaluated prior to implementing solutions. The final component of the TREES project is an implementation plan which will identify investment strategies for financing retrofitting on a large scale, and encourage property owners to make their sites more sustainable. TreePeople has also been a great resource in helping to design solutions for several of the other projects discussed here.

Venice Off-Street Parking Lot projects are currently in progress by the city of Los Angeles' Architectural Division, incorporating several methods of Storm Water Management Best Practices. One of these projects is the lot used for the Venice Farmer's Market, at the corner of Venice Boulevard and Venice Way. It was recently redesigned to capture and filter runoff onsite. Strip filters surrounding the lot collect runoff for bio-filtration and groundwater recharge. The lot was landscaped to collect additional runoff and reduce the amount of "hardscape" area. The city is also installing porous paving and filtration devices in very creative ways on other sites.

Where Do We Go From Here?

This small sampling of projects illustrates the diversity of design strategies being implemented to manage stormwater runoff and reduce the need for more regional disposal facilities. There are many other examples of sustainable practices in use or in the planning stages throughout the county. This demonstrates the change of thinking that is taking place --

stormwater is starting to be considered an asset that may be put to beneficial use, while at the same time protecting the public from devastating floods.

A comprehensive watershed management plan can only be developed if appropriate tools are available to assess the different management strategies. Geographic Information Systems (GIS) are one tool that can be used to assess the cumulative impacts when different watershed management strategies are implemented in a watershed. Appendix A presents some of the data that can be used in GIS watershed management tools. The data presented in Appendix A are just a sampling of the data available for the Los Angeles - San Gabriel watershed. Future work should focus on developing new data and on using the data to assess the impacts of different watershed management strategies.

Development of new methodologies requires interdisciplinary thinking, which may require unconventional partnerships between different disciplines. A cooperative approach is needed to manage all of the individual but interrelated issues in the watershed. Reducing stormwater volume and velocity is only part of the picture, but it is an increasingly important component of a comprehensive stormwater and watershed management plan.

Notes

[1] Williams, Philip B. 1994. Flood Control vs. Flood Management, *Civil Engineering*, Vol. 64, No. 5: 51-57.

[2] Task Committee on the Design of Outlet Control Structures. 1985. *Stormwater Detention Outlet Control Structures*. New York: American Society of Civil Engineers.

[3] Ferguson, Bruce K. and Debo, Thomas N. 1990. *On-Site Stormwater Management: Applications for Landscape and Engineering*. New York: Van Nostrand Reinhold.

[4] Ferguson and Debo, 1990.

[5] Stahre, Peter and Urbonas, Ben. 1990. *Stormwater Detention for Drainage, Water Quality, and CSO Management*. New Jersey: Prentice Hall; Ferguson and Debo, 1990.

[6] Mount, Jeffrey. 1995. *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use*. Berkeley: University of California Press; *also* Williams, Philip B. 1990. "Rethinking Flood-Control Channel Design." *Civil Engineering*. Vol. 60, No. 1: 57-9.

[7] Williams, Philip B. 1997. *California's Opportunity to Achieve Improved Flood Management and Major Ecosystem Restoration*. Technical paper published on the Internet by Philip Williams & Associates, Ltd., San Francisco (http://www.edf.org).

[8] Williams, Philip B. 1990. "Rethinking Flood-Control Channel Design." *Civil Engineering*. Vol. 60, No. 1: 57-9.

[9] Geiger, Wolfgang F. 1993. "Concepts for Flood Control in Highly Urbanized Areas." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

[10] Tom Richman & Associates. 1997. *Start at the Source: Residential Site Planning & Design Guidance Manual for Stormwater Quality Protection*. Palo Alto: Tom Richman & Associates and Bay Area Stormwater Management Agencies Association.

[11] Lazaro, Timothy R. 1990. *Urban Hydrology – A Multidisciplinary Perspective*. Lancaster, PA: Technomic Publishing Co, Inc.

[12] Colyer, Peter J. 1982. "Detention storage as an equivalent rainfall depth." In *Stormwater Detention Facilities: Planning, Design Operation and Maintenance*. Conference Proceedings, ed. DeGroot, William. New York: American Society of Civil Engineers.

[13] Lazaro, 1990.

[14] Barrett, et al. "Permanent Runoff Controls." *Civil Engineering*. Vol. 67, No. 10:72-3.

[15] Terrene Institute. 1996. *A Watershed Approach to Urban Runoff.* Washington, DC: Terrene Institute.

[16] Glick, Roger H., Wolfe, Mary Leigh and Thurow, Thomas L. 1993. *Effectiveness of Native Species Buffer Zones for Nonstructural Treatment of Urban Runoff.* Technical Report No. 156. College Station, TX: Texas Water Resources Institute. October 1993.

[17] Galli, John. 1990. *Peat Sand Filters: A Proposed Stormwater Management Practice for Urbanized Areas.* Washington, DC: Metropolitan Washington Council of Governments. December 1990.

[18] For more information on this project, contact Long Beach Organic at (562) 438-9000

[19] TreePeople 1998. *T.R.E.E.S. Project Second Nature Planbook.* http://www.treepeople.org

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Appendix A:

Spatial Data for the Los Angeles-San Gabriel Watershed

A comprehensive stormwater management plan must be based on different physical data of the watershed and appropriate tools for analysis. The maps presented in Figures A1-A3 present three examples of types of data that are important in forming an alternative stormwater management plan for the Los Angeles - San Gabriel Rivers watershed. Figure A1 shows the digital elevation model (DEM) for the watershed at a 30-meter spatial resolution, which may be used to derive slope. Figure A2 shows the current land uses for the watershed and Figure A3 shows the rainfall infiltration rates, based on soil type. Other useful data may include "shrink-swell" potential of different soils, type of vegetation cover in undeveloped areas, location and depth of groundwater basins, and the spatial variability of precipitation amount and intensity.

These data can be used to identify areas where nontraditional approaches to stormwater management may be implemented. For instance, the soil infiltration rates identify those areas where it might be appropriate to place permeable pavements and onsite infiltration facilities. Identification of these areas can also be accomplished by creating hydrologic units -- combinations of soil attributes, slope, and land use -- to identify areas that have common hydrologic characteristics. Finally, these data can also be used to assess the cumulative impact of stormwater management practices in the watershed.

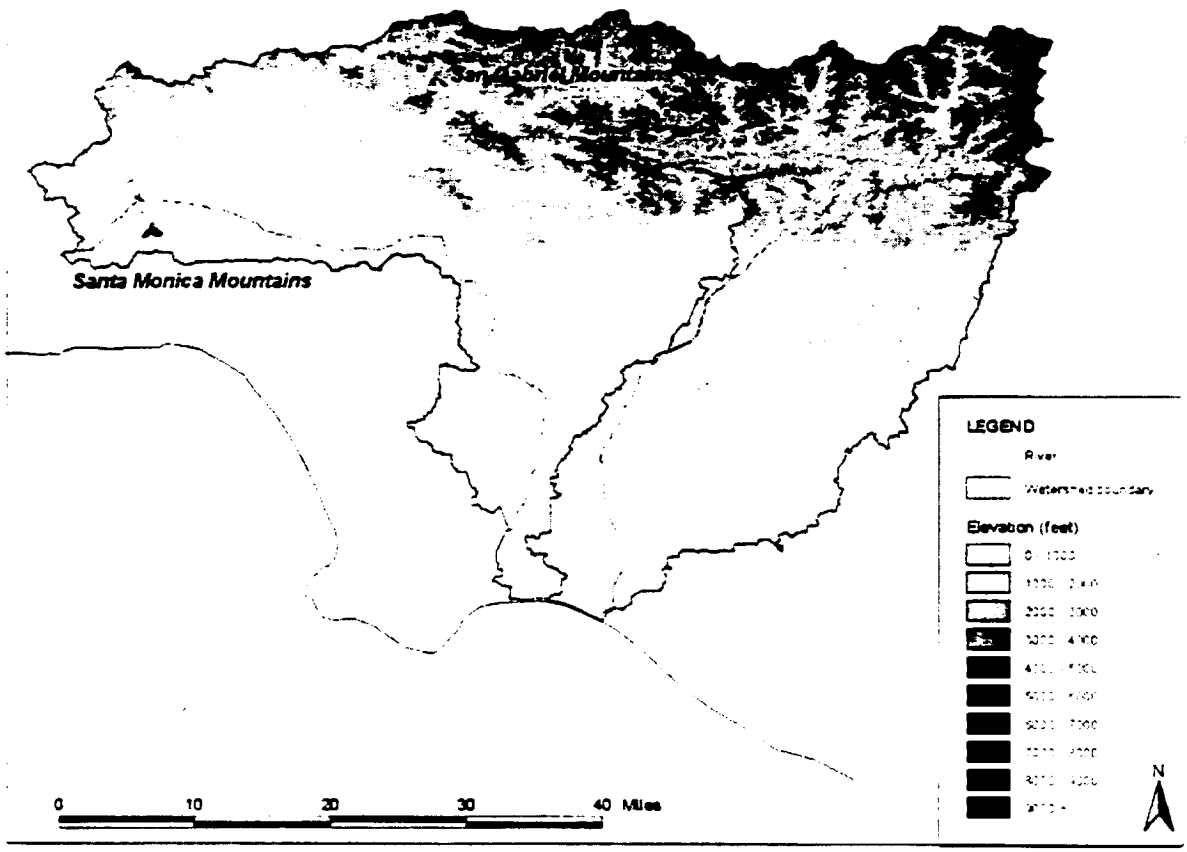

Figure A1: Digital elevation model (DEM) for the Los Angeles - San Gabriel watersheds.

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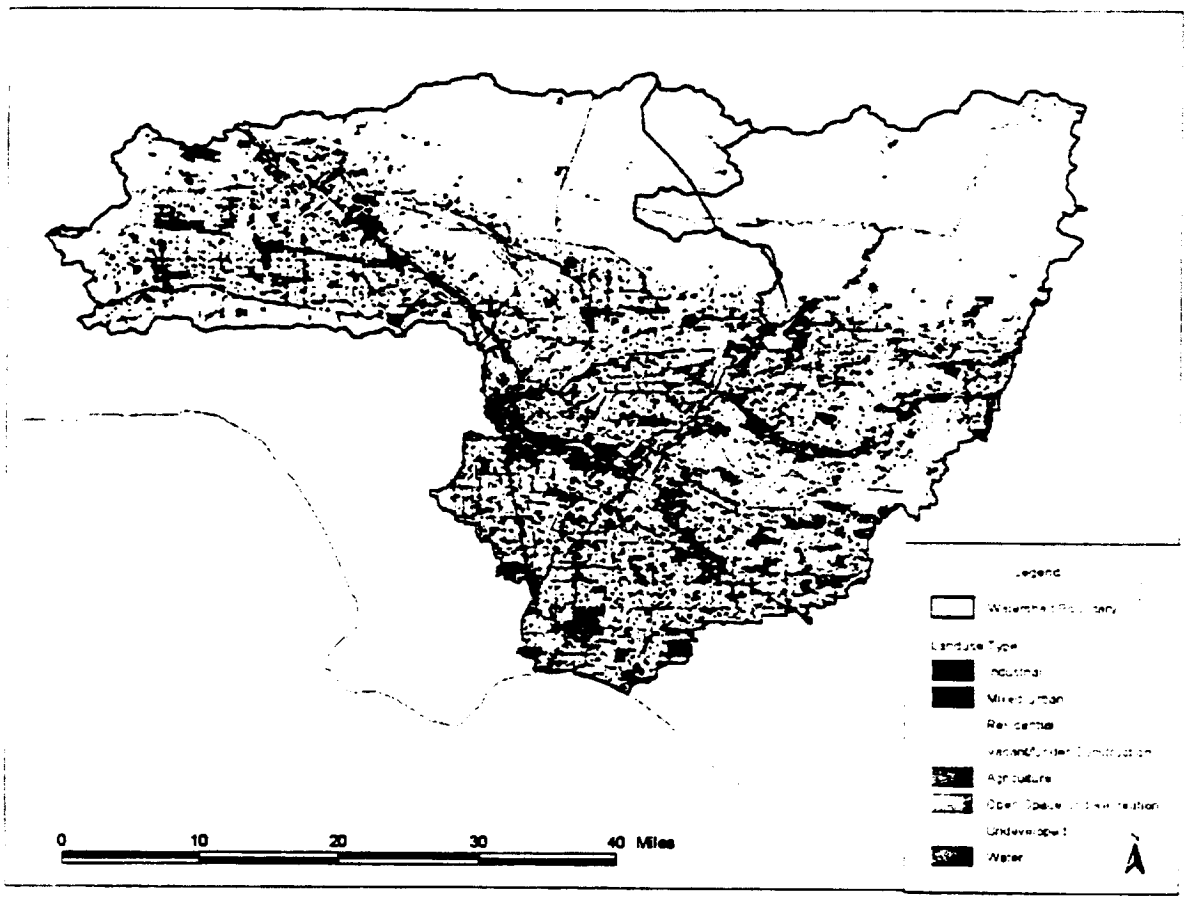

Figure A2: Current land uses for the Los Angeles - San Gabriel watersheds.

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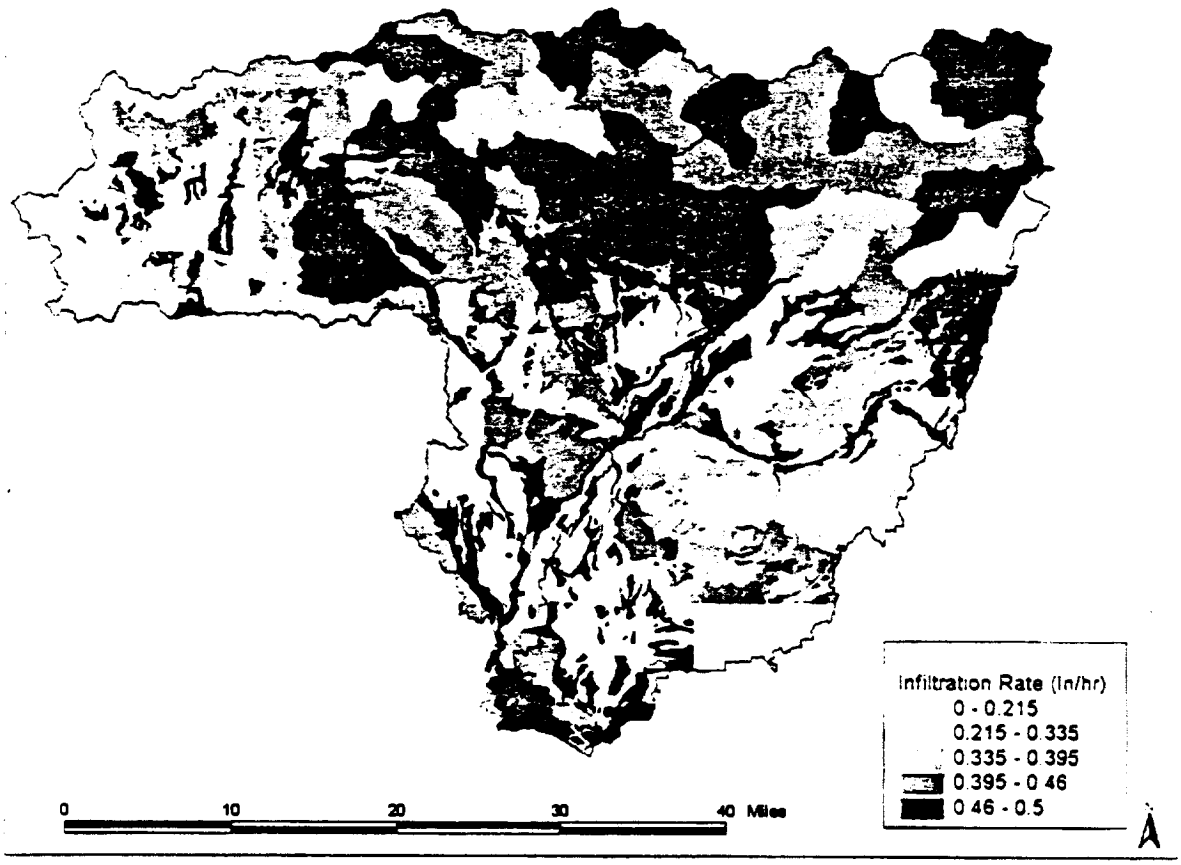

Figure A3:Infiltration rates for the Los Angeles - San Gabriel watersheds based on a 0.5 inch per hour rainfall intensity.

d. Use retention structures or design rooftops to store runoff. Utilize subsurface areas for storm runoff either for reuse of to enable release of runoff at predetermined times or rates to minimize the peak discharge into storm drains. Cisterns are also a possible storage mechanism for reuse; and

e. Design curbs, berms or the like so as to avoid isolation of permeable or landscaped areas.

3. **Reduce parking lot pollution:**

a. All parking lots are required to use oil and water separators or clarifiers to remove petroleum-based contaminants and other pollutants which are likely to accumulate;

b. Direct runoff toward permeable areas and away from pollutant laden areas such as parking lots; and

c. Construct portions of parking lots from porous materials.

C. **Criteria for evaluation of mitigation plans.** The City's evaluation of each Urban Runoff Mitigation Plan will ascertain how well the proposed plan meets the combined goals set forth in Subsection B. above. Each plan will be evaluated on its own merits according to the particular characteristics of the project and the site to be developed.

D. **Waiver of Runoff Mitigation plan.** Full or partial waivers of compliance with this Section may be obtained by persons who apply on forms supplied by the City and show that incorporation of design elements that address the objectives set forth in Subsection B., above is an economic and physical impossibility due to the particular configuration of the site or to irreconcilable conflicts with other City requirements. Requests for waivers shall be granted or denied, in writing, by a three-member board comprised of one representative each from the City's Planning Division, City Engineering Department, and City Manager's Office. Their decision shall be forwarded to the Council for final approval.

E. **Compliance as condition of approval.** Compliance with an approved Runoff Mitigation Plan shall be a condition of approval of any required planning approval.

F. **Erosion control.** Erosion shall be controlled as follows:

1. All construction sites shall provide a plan to prevent erosion during construction to be approved by the City Engineer; and

2. Sloping lots shall provide soil holding plants as part of their ongoing landscape maintenance and planting for erosion control will be part of their *Water Conservation Landscape* plans. (See the Water Conservation Landscape Ordinance.)

MINIMUM PERCENTAGE OF SITE AREA REQUIRED TO BE PERVIOUS SURFACE, BY APPLICABLE ZONING DISTRICT

Zoning District or Development Feature	Minimum Pervious Surface
RS - Sites of less than 1/3 acre	50%
RS - Sites of 1/3 acre or more	65%
RM - Multi-family projects	45%
RM - Mobile home parks	25%
HM	86%
RR	70%
RC	65%

Zoning District or Development Feature	Minimum Pervious Surface
CL	28%
CR	22%
CO	24%
CB	28%
CT	28%
CMU	38%
All parking lots	30%

b. Use natural drainage, detention ponds or infiltration pits so that runoff may collect and seep into the ground and reduce or prevent off-site flows;

c. Divert and catch runoff through the use of drainage swales, berms, green strip filters, gravel beds and french drains; and

d. Construct driveways and walkways from porous materials to allow increased percolation of runoff into the ground.

2. **Minimize runoff.** Minimize the amount of runoff directed to impermeable areas and/or maximize storm water storage for reuse:

a. Install rain gutters and orient them towards permeable surfaces rather than driveways or nonpermeable surfaces so that runoff will penetrate into the ground instead of flowing off-site;

b. Modify grades of property to divert flow to permeable areas and to minimize the amount of storm water leaving the property;

c. Use sediment traps to intercept runoff from drainage areas and hold or slowly release the runoff, with sediments held in the trap for later removal;

5. Other existing or future NPDES Permits and any amendments, revisions or reissuance thereof by either Federal, State, County, or City regulatory agencies.

17.56.030 - Urban Runoff Mitigation Plan Requirements

The following runoff reduction requirements shall apply to all persons submitting applications for New Development within the City, whether fulfilled by the Federal SWPPP format, by the less detailed City *Runoff Mitigation Plan* (RMP), or as an additional measure.

A. **Submittal of Runoff Mitigation Plan.** At the time of submittal of an application for the first planning approval for a New Development project, an applicant shall be required to submit to the City Engineer either a *Runoff Mitigation Plan* to the City Engineer, or copy of Notice of Intent (NOI) filed with the Regional Water Quality Control Board.

B. **Goal for runoff reduction.** In developing a Runoff Mitigation Plan, an applicant shall demonstrate an effort to reduce projected runoff for the project by 20 percent from the base 1985 10-year storm basis, through incorporation of design elements or principles which address each of the goals set forth below in Subsections B.1, B.2, and B.3. The design elements utilized by an applicant may, but are not required to, include those provided on the list below, with the exception of Subsection B.2.b which is required where applicable. Although design elements are set forth as if they address only one goal, in many cases they address more than one and can be used to address multiple goals in achieving the reduced runoff to be achieved by the mitigation plan.

1. **Increase permeable areas.** The following measures shall be used to increase the permeable areas on the site.

    a. To slow runoff and maximize infiltration, the percentage of a project site shown in the following table shall be permeable area, based on the applicable zoning district. The area may include vegetation, pervious paving materials and porous materials for or near walkways, which increase the amount of runoff seepage into the ground. Permeable surface materials can include wood decking materials, brick or stone with spaces to allow percolation between stones, and similar methods.

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17.56.020 - Applicability

A. **Applicability of provisions.** The provisions of this Chapter apply as detailed below, to any proposed land use or development involving grading activities, or the construction of new structures or paving. Compliance with the provisions of this Chapter shall be required through land use permit or subdivision conditions of approval. Any necessary pollution control measures shall be installed prior to construction, or site/structure occupancy, as deemed appropriate by the City. In all cases, the applicant/permittee is responsible for ensuring compliance with the provisions of this Chapter.

1. Applicants proposing construction on parcels of 5 acres or more, or any industrial facilities shall be required to submit a *Stormwater Pollution Prevention Plan* (SWPPP) in compliance with the requirements of the Federal Clean Water Act, U.S. Environmental Protection Agency (EPA), and the California Water Resources Board. The application shall also include a *Hazardous Materials Handling and Spill Response Plan* related to construction activities, and in the case of industrial facilities, shall also address operations after construction. The applicant shall submit a copy of the SWPPP to the City prior to the processing of any land use permit or subdivision application, or the granting of any construction permits.

2. All new or re-built retail/commercial/industrial parking lots shall provide a sub-surface filtering system for oil & grease contaminates as part of their application in compliance with the Administrative Policies of the City.

3. All projects shall submit a Runoff Mitigation Plan which illustrates the Best Management Practices they will be utilized to reduce stormwater flow and to prevent pollutants from running off the built project as part of the application and initial planning process.

B. **Responsibility for administration.** This Chapter shall be administered by the City Engineer or his or her designee in coordination with the Director of Planning and Building Services.

C. **Regulatory consistency.** This Chapter shall be construed to assure consistency with the requirements of:

1. The Federal Water Pollution Control Act, 33 USCS § 1251 et seq., and the applicable implementing regulations;

2. The mandates and rulings of the US Environmental Protection Agency (EPA);

3. The NPDES permit of Los Angeles County and its "co-permitees";

4. The Calabasas General Plan; and

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Task Committee on the Design of Outlet Control Structures. 1985. *Stormwater Detention Outlet Control Structures*. New York: American Society of Civil Engineers.

Terrene Institute. 1996. *A Watershed Approach to Urban Runoff*. Washington, DC: Terrene Institute.

Tom Richman & Associates. 1997. *Start at the Source: Residential Site Planning & Design Guidance Manual for Stormwater Quality Protection*. Palo Alto: Tom Richman & Associates and Bay Area Stormwater Management Agencies Association.

TreePeople. 1998. *T.R.E.E.S. Project Second Nature Planbook*. http://www.treepeople.org

United Nations Centre for Human Settlements (Habitat). 1991. *Stormwater Drainage and Land Reclamation for Urban Development*. Nairobi: United Nations.

United States Army Corps of Engineers. 1992. *Los Angeles County Drainage Area Review: Final Feasibility Study. Interim Report and Environmental Impact Statement*. Los Angeles: US Army Corps, Water Resources Branch.

United States Environmental Protection Agency, Office of Water. 1996. *Managing Urban Runoff*. Washington, DC: US EPA.

Wada, Yashuhiko and Miura, Hiroyuki. 1993. "Prediction and Estimation of Stormwater Runoff Control by the Combined Stormwater Infiltration Facilities with Simulation Model." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

Williams, Philip B. 1997. *California's Opportunity to Achieve Improved Flood Management and Major Ecosystem Restoration*. Technical paper published on the Internet by Philip Williams & Associates, Ltd., San Francisco (http://www.edf.org).

_____. 1990. "Rethinking Flood-Control Channel Design." *Civil Engineering*. Vol. 60, No. 1: 57-9.

Woodward-Clyde Consultants. 1994. *Los Angeles County Drainage Area Project: Master EIR*. Santa Ana: Woodward-Clyde Consultants. December 1994.

Woodward-Clyde Consultants, Camp Dresser & McKee Inc. and others. 1997. *Model Programs for Stormwater Management Within the County of Los Angeles: Development Planning*. Los Angeles: LA County Department of Public Works. Fourth Draft, October 1997.

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Kubani, Dean. 1996. *Sustainable City Progress Report.* Santa Monica: City of Santa Monica Task Force on the Environment.

Lazaro, Timothy R. 1990. *Urban Hydrology – A Multidisciplinary Perspective.* Lancaster, PA: Technomic Publishing Co, Inc.

Los Angeles County Department of Public Works, 1989, *Hydrology Manual*, Alhambra, California.

Miller, A. Richard. 1997. "Porous Pavement: Pavement That Leaks" WEB site article: http://MMS.TheMillers.com/

Mount, Jeffrey. 1995. *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use.* Berkeley: University of California Press.

Niemczynowicz, Janus. 1993. "Integrated Water Management Background to Modern Approach." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

Roley Jr., William. 1993. Watershed Restoration and Management Model. In *Interface Between Ecology and Land Development in California.* Jon Keeley, ed. Los Angeles: Southern California Academy of Sciences.

Schueler, Thomas R., Kumble, Peter A. and Heraty, Maureen A. 1992. *A Current Assessment of Urban Best Management Practices: Techniques for Reducing Non-Point Source Pollution in the Coastal Zone.* Washington, DC: Metropolitan Washington Council of Governments. March 1992.

Sheaffer, John R. and Wright, Kenneth R. 1982. *Urban Storm Drainage Management.* New York: Marcel Dekker, Inc.

Simons, Li and Associates. 1997. *A Report on the Work of the Los Angeles River Watershed Task Force Regarding the Los Angeles River Alternative Flood Control Study.* Los Angeles: County Department of Public Works. November 1997.

Smith, April and Hahn, Kate. 1997. *Second Nature: Adapting LA's Landscape for Sustainable Living.* Marina del Rey: ReThink.

Stahre, Peter and Urbonas, Ben. 1990. *Stormwater Detention for Drainage, Water Quality, and CSO Management.* New Jersey: Prentice Hall.

Storm Water Quality Task Force (SWQTF). 1993. *California Storm Water Best Management Practice Handbooks: Construction.* Sacramento: Water Resources Control Board.

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CHAPTER 17.56 - URBAN RUNOFF POLLUTION CONTROL

Sections:

17.56.010 - Purpose
17.56.020 - Applicability
17.56.030 - Urban Runoff Mitigation Plan Requirements
17.56.040 - Drainage Structure Stenciling
17.56.050 - Pollution Prevention Agreements
17.56.060 - Required Best Management Practices

17.56.010 - Purpose

Recognizing the health and safety benefits of clean water, the purpose of this chapter is to ensure that activities within Calabasas add no new pollutants to our waterways and reduce present pollutant levels and sediments which are carried to our area and regional waterways through stormwater runoff. The concerns of stormwater management—to mitigate pollutant and sediment loading—will include concepts of slowing water flows to allow percolation and other filtering Best Management Practices (BMPs) to work in harmony with the topography, and ensuring that designs for pollutant management are part of the planning and approval processes of new developments. Meeting these goals can include:

A. Reducing non-storm water discharge into the municipal storm water system and area creeks by slowing runoff and maximizing infiltration.

B. Eliminating the spillage, dumping, and disposal of significant materials and pollutants into the municipal storm water system.

C. Reducing pollutant loads in storm water and urban runoff through the use of appropriate Best Management Practices.

D. Reducing the runoff of oil and gas pollutants into area storm water systems and creeks by filtration and/or bio-remediation of commercial/retail/industrial parking lots.

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Appendix B:

City of Calabasas Development Code

City of Malibu Municipal Code: Storm Water Management for New Development

City of Santa Monica Runoff Control Ordinance

G. **Hazardous and toxic materials control.** The use of toxic and hazardous materials shall be controlled as follows:

1. Industrial facilities shall file a copy of their Hazardous Materials Handling and Spill Response Plan with the City Engineer;

2. Restaurants shall provide the City Engineer with appropriate plans for handling grease which may include bio-remediation; and

3. Commercial, industrial, retail and multi-family developments will provide a plan for reduced use of pesticides and herbicides as part of their Water Conservation Landscaping plans.

17.56.040 - Drainage Structure Stenciling

Where a catch basin or other drainage structure is required for a proposed project, written and/or graphic information discouraging the dumping, discarding, and/or discharge of pollutants into the storm drainage system shall be permanently affixed to the structure in a location approved by the City Engineer. The information shall be painted, stamped into the concrete, or provided on a metal plaque affixed to the structure as approved by the City Engineer or his or her designee.

17.56.050 - Pollution Prevention Agreements

Prior to final building inspection, or the filing of a Final Map, as applicable, the applicant shall enter into a Pollution Prevention Agreement with the City or other agency designated by the City. The agreement shall include, but is not limited to, the following provisions:

A. Authorization for the City or other agency designated by the City to inspect on-site pollution prevention facilities with respect to the accumulation and concentration of pollutants, garbage and/or debris, so as to prevent the discharge of pollutants, garbage and/or debris into streets and/or the storm drainage system;

B. Fair share participation in the periodic cleaning of storm drain facilities, increases in street sweeping, and increases in the emptying of roadside trash receptacles resulting from the project;

C. Fair share participation in the funding of the City's Public Information and Education Program(s) for the disposal of waste, recycling, and water conservation; and

D. Requirements that any applicable conditions, covenants, and restrictions (CC&Rs) include statements encouraging homeowners, and persons in control of homes and businesses to:

1. Prevent the improper disposal of litter, lawn/garden clippings and pet feces into streets or other areas where runoff may carry pollutants into the storm drainage system;

2. Remove dirt, trash and debris from sidewalks and alleys that may contribute pollutants to urban runoff;

3. Recycle oil, glass, plastic, and other materials to prevent improper disposal into the storm drainage system;

4. Properly dispose of household hazardous waste to prevent improper disposal into storm drainage system; and

5. Properly use and conserve water.

17.56.060 - Required Best Management Practices

The owner, occupant or other person in charge of day-to-day operation of each premises within the City shall implement the best Management Practices or use Good Housekeeping Practices, as applicable, as follows.

A. For premises with parking lots with more than 25 parking spaces exposed to stormwater and which parking lots are associated with industrial or commercial activities, according to the United States Office of Management and Budget Standard Industrial Classification Code, the owner, occupant or other person in charge of day-to-day operation shall use BMPs to reduce the discharge of pollutants to the maximum extent practicable. Such measures may include rear sweeping or other measures, if effective.

B. For premises where machinery or other equipment which is repaired or maintained at facilities or activities associated with industrial or commercial activities, according to the United States Office of Management and Budget Standard Industrial Classification Manual, the owner, occupant or other person in charge of day-to-day operations shall use BMPs or other steps to prevent discharge of maintenance or repair related pollutants to the MS4.

C. For other premises exposed to stormwater, the owner, occupant or other person in charge of day-to-day operations shall use BMPs, if they exist, or other methods to reduce the discharge of pollutants to the maximum extent practicable, including the removal and lawful disposal of any solid waste or any other substance which, if it were to be discharged to the MS4, would be a pollutant, including fuels, waste fuels, chemicals, chemical wastes and animal wastes, from any part of the premises exposed to stormwater.

5408. Requirements for Industrial/Commercial and Construction Activities. C-10-

Each industrial discharger, discharger associated with construction activity, or other discharger described in any general storm water permit addressing such discharges, as may be issued by the U.S. Environmental Protection Agency, the State Water Resources Control Board, and the Regional Board shall comply with all requirements of such permit. Each discharger identified in an individual NPDES Permit shall comply with and undertake all activities required by such permit. Proof of compliance with any such permit may be required in a form acceptable to the Authorized Enforcement Officer prior to the issuance of any grading, building or occupancy permits, or any other type of permit or license issued by the City.

5409. Storm Water Management Plan for New Development.

A. Prior to issuance of a building permit for any new development (on undeveloped land) or final map approval for any subdivision of property the applicant shall be required to have approval of a Storm Water Management Plan from the Department of Public Works and the Department of Environmental and Building Safety.

B. The Stormwater Management Plan shall incorporate the following elements:

1. Construction Erosion Control - as required under Article VIII, Chapter 1, Section 7010 - Building Regulations of this Code.

2. Storm drainage improvement measures to mitigate any offsite/downstream negative impacts due the proposed development. This includes, but not limited to;

a) Mitigating increased runoff rate due to new impervious surfaces through on-site detention such that peak runoff rate after development does not exceed the peak runoff of the site before development for the 100 year clear flow storm event (note; Q/100 is calculated using the Caltrans Nomograph for converting to any frequency, from the Caltrans "Hydraulic Design and Procedures Manual"). The detention basin/facility is to be designed to provide attenuation and released in stages through orifices for 2-year, 10-year and 100-year flow rates, and the required storage volume of the basin/facility is to be based upon 1-inch of rainfall over the proposed impermeable surfaces plus 1/2-inch of rainfall over the permeable surfaces. All on-site drainage devices, including pipe, channel, and/or street & gutter, shall be sized to cumulatively convey a 100 year clear flow storm event to the detention facility, or;

b) Demonstrating by submission of hydrology/hydraulic report by a registered engineer that determines entire downstream storm drain conveyance devices (from project site to the ocean outlet) are adequate for 25-year storm event,

R0069569

or;

c) Constructing necessary off-site storm drain improvements to satisfy (b) above, or;

d) Other measures accomplishing the goal of mitigating all offsite/downstream impacts.

3. Storm drain pollution prevention measures including all construction elements and Best Management Practices (BMP's) to address the following goals in connection with both construction and long-term operation of the site;

a) Maximize, to the extent practicable, the percentage of permeable surfaces in order to allow more percolation of runoff into the ground,

b) Maximize, to the extent practicable, retention of dry-weather runoff on-site to allow percolation into the ground, or installation of other treatment measures thereby preventing pollutants from entering the storm drain system.

C. The City's evaluation of the Storm Water Management Plan will ascertain how well the proposed plan meets the combined objectives set forth above. In addition, the City will analyze the watershed characteristics and land uses, and estimate water quality requirements for each project. Each plan will be evaluated on its own merits according to the particular characteristics of the project and the site to be developed.

D. The Storm Water Management Plan shall be approved or disapproved by the Director of Public Works and the Director of Building and Safety (or their designees) within twenty-one (21) calendar days following submittal. If the plan is disapproved, the reasons for disapproval shall be given in writing to the applicant.

E. Full or partial waivers of compliance with this Section may be obtained for development sites where it can be adequately demonstrated that the accomplishment of these storm drain management measures is an economic and/or physical impossibility due to the particular configuration of the site or due to irreconcilable conflicts with other City requirements. Requests for waivers must be approved, in writing, by the Planning Department, the Public Works Department, and the Environmental and Building Safety Department.

F. The applicant is required to comply with the approved Storm Water Management Plan.

5410. Enforcement.

A. Violations Deemed a Public Nuisance.

1. Any condition caused or permitted to exist in violation of any of the provisions of this Chapter is hereby determined to be a threat to the public health, safety and

excluded from grading limitations;

10. Development Area. Every residential development shall be contained within a convex-shaped enclosure that shall not exceed 2 acres.

11. Impermeable Coverage. Use of permeable surfaces is encouraged, especially for driveways. However, including the primary structure, impermeable surfaces are permitted for lot areas (excluding slopes equal to or greater than 1:1), up to 1/4 acre at 45%; for lot areas greater than 1/4 acre but a ½ acre or less, at 35% and for lots greater than ½ acre at 30% up to a maximum of 25,000 square feet. Beachfront lots shall not be subject to this Paragraph 11. (Ord. 93, 06-14-93)

12. Site of Construction. Structures may be constructed on slopes greater than 3:1 but less than 2 1/2:1 subject to the provisions for Section 9.4.23. (Ord. 93, 06-14-93)

13. Structure Size. Except as specifically provided herein, and as indicated on the Total Development Square Footage Structure Size Chart, the total development square footage associated with the construction of a single-family or multiple-family residence on a legal lot equal to or greater than 5 acres shall not exceed a total of 11,172 square feet. On lots 5,000 square feet or less, the total development square footage shall not exceed 1,885 square feet. Total development square footage shall be determined based on the following formula (slopes equal to or greater than 1:1 shall be excluded from the lot area calculation): for lot areas up to ½ acre, total square footage shall be 17.7% of lot area plus 1,000 square feet; for lot areas greater than ½ acre and up to 1 acre, total development square footage shall be increased by 10% of the amount of lot area exceeding ½ acre; for lot areas greater than 1 acre and up to 1 ½ acre, total development square footage shall be increased by 5% of the amount of lot area exceeding 1 acre; for lot areas greater than 1 ½ acres and up to 5 acres, total development square footage shall be increased by 2% of the amount of the lot area exceeding 1 ½ acres. For the purposes of this subsection, arbors or trellis open to the sky shall not be calculated as part of the total development square footage. Beachfront lots shall be exempt from the provisions of this paragraph 13. (Ord. 93, 06-14-93)

R0069571

Reference List

Barrett, Michael, Smith, Peter and Malina Jr., Joseph. 1997. "Permanent Runoff Controls." *Civil Engineering*. Vol. 67, No. 10: 72-3.

Buchholz, Gwendolyn and Siems, Sandra. 1994. *Defining the Urban Stormwater Runoff Problem*. Walnut Creek, CA: Montgomery Watson.

Center for Watershed Protection. 1998. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. Maryland:Center for Watershed Protection.

City of Calabasas. July 1998. "Urban Runoff Pollution Control," Calabasas Municipal Code - Title 17, Land Use and Development Code, chapter 17.56.

Colyer, Peter J. 1982. "Detention storage as an equivalent rainfall depth." In *Stormwater Detention Facilities: Planning, Design Operation and Maintenance*. Conference Proceedings, ed. DeGroot, William. New York: American Society of Civil Engineers.

Ferguson, Bruce K. and Debo, Thomas N. 1990. *On-Site Stormwater Management: Applications for Landscape and Engineering*. New York: Van Nostrand Reinhold.

Fisher, Gary T. and Katz, Brian G. 1988. *Urban Stormwater Runoff – Selected Background Information and Techniques for Problem Assessment, with a Baltimore, Maryland Case Study*. USGS Water Supply Paper 2347. Washington, DC: USGPO.

Galli, John. 1990. *Peat Sand Filters: A Proposed Stormwater Management Practice for Urbanized Areas*. Washington, DC: Metropolitan Washington Council of Governments. December 1990.

Geiger, Wolfgang F. 1993. "Concepts for Flood Control in Highly Urbanized Areas." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

Glick, Roger H., Wolfe, Mary Leigh and Thurow, Thomas L. 1993. *Effectiveness of Native Species Buffer Zones for Nonstructural Treatment of Urban Runoff*. Technical Report No. 156. College Station, TX: Texas Water Resources Institute. October 1993.

Harada, Shigeki and Ichikawa, Arata. 1994. "Performance of the Drainage Infiltration Strata: Statistical and Numerical Analyses." *Water Science & Technology*. Vol. 29, No. 1-2

Interagency Floodplain Management Review Committee (IFMRC). 1994. *Sharing the Challenge: Floodplain Management into the 21st Century*. Report to the Administration Floodplain Management Task Force. Washington, DC: US Government Printing Office.

R0069572

XS

LOS CERRITOS WETLANDS
TASK FORCE
5710 EAST SEVENTH ST. SUITE 168
LONG BEACH, CA 90803 • 562-630-1491

Thursday, September 9th, 1999

Members of the Board
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standard Storm Water Mitigation Plans (SUSMPs) on stormwater runoff controls for development projects at: 1)100+ home subdivision; 2)10-99 home subdivision; 3)100+ square-foot commercial development; 4)automobile repair facilities; 5)retail gasoline outlets; 6)restaurants; 7)hillside located single-family dwelling.

Dear Members of the Board,

We wish to provide strong support for the recommended changes the Executive Officer, Mr. Dennis Dickerson, proposes to include in the Standard Storm Water Mitigation Plans (SUSMPs). In addition, we wish to support Heal the Bay's concern for the need to provide a one hundred foot physical buffer width as well as separate language for the special considerations involving Environmentally Sensitive Areas.

The President and members of this Task Force have been directly involved in developing and providing support to the Sustainable Cities program for the City of Long Beach. The establishment of a Sustainable Cities program is evolving through the new Environmental Task Force of the Strategic Plan convened with representation appointed by the Mayor and Council of the City of Long Beach to review the Open Space Element of the City of Long Beach's General Plan. Many design elements and structural controls such as rainfall capture cisterns are incorporated into this Sustainable Cities program.

There must be an even playing field in development standards between Los Angeles County unincorporated areas and the Cities within the County. This even playing field reference appeal was made to you on this issue by the City of Long Beach during the hearing of the Cities' stormwater permit on June 30th. There is no question that the playing field must be even and everyone adhere to a minimum standard as suggested by the Executive Officer to reduce and retain onsite stormwater runoff which in itself will reduce downstream water quality impacts.

One of the focus areas of the Los Angeles and San Gabriel Rivers Watershed

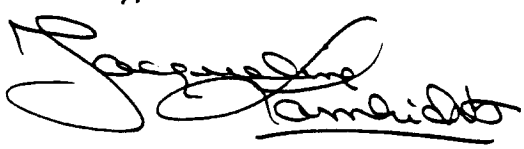
Council is to explore alternative land use patterns and management for storm water. For your reference is the draft copy of the Watershed Council's first white paper: " Storm Water: Asset or Liability". On page two, the graph illustrates the ratio of runoff to precipitation over time. What is interesting is that prior to the mid 1960's runoff was 20 percent and infiltration and evaporation amounted to 80 percent. Since the mid 1960's infiltration and evaporation has been reduced to only 50 percent and declining further with the ever increasing impermeable construction. To assist in rethinking the traditional approaches to stormwater management local examples are described in pages 12 and 13 and techniques described in pages 6 though 12. Examples of locally developed ordinances are included as appendices to this paper as guidance for other municipalities.

It is critical that the Executive Officer's recommended changes be included in the SUSMPs. Especially, when the fate of the last remaining open spaces in Los Angeles County for new and redevelopment are debated in the Los Angeles Times as recently as the attached article of Tuesday September 7th, 1999.

The Los Cerritos Wetlands Task Force mission is *to preserve, protect, enhance and restore the wetlands of the San Gabriel Estuary.*

Please contact me to further discuss at (626) 794-0487.

Sincerely,



Jacqueline Lambrichts
Water Quality Regulatory

Attachments - two

cc: Don May - President of the Los Cerritos Wetlands Task Force

NATURAL RESOURCES DEFENSE COUNCIL

January 24, 2000

Via Facismile 562-904-7296

Desi Alvarez, Chairman
Executive Advisory Committee
Stormwater Program - Los Angeles County
c/o Department of Public Works
P.O. Box 7016
Downey, CA 90241-7016

Dear Mr. Alvarez:

We have received a copy of your letter of December 22, 1999, regarding the Los Angeles Regional Water Quality Control Board's December 7, 1999, Standard Urban Stormwater Mitigation Plan proposal (the "Proposal"). Your letter offers comments, allegedly on behalf of the entire Executive Advisory Committee ("EAC") membership, designed to promote "a SUSMP that is acceptable to all parties."

Pursuant to the California Public Records Act (California Government Code Sections 6250 *et seq.*), we hereby request that you immediately forward us the city council resolutions authorizing you to represent the EAC members regarding the Proposal, and to represent, on their behalves, what would be "acceptable to all parties."

Please feel free to call if you have any questions. Thank you in advance for your cooperation.

Sincerely,

Alex N. Helperin

cc: Dennis Dickerson

R0069575

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NATURAL RESOURCES DEFENSE COUNCIL

January 24, 2000

Via Facsimile 626/564-1116

Harry Baldwin, President
San Gabriel Valley Council of Governments
3871 E. Colorado Blvd., Suite 101
Pasadena, CA 91107

Dear Mr. Baldwin

We have received a copy of your letter of December 16, 1999, regarding "COG Resolution Opposing Numerical Standards on New Developments." Your letter indicates that the SGVCOG represents, among others, the residents of "our 30 cities," and that, on behalf of those cities, the SGVCOG opposes the Los Angeles Regional Water Quality Control Board's December 7, 1999, Standard Urban Stormwater Mitigation Plan proposal (the "Proposal").

However, at least one of your member cities – the City of Pasadena – has written its own letter in substantial *support* of the Proposal.[1] This inescapable contradiction suggests that you may have misrepresented the position of your members to the Los Angeles Regional Water Quality Control Board.

Accordingly, and pursuant to the California Public Records Act (California Government Code Sections 6250 *et seq.*), we hereby request that you immediately forward us the authorizing resolutions of each member city, on which you base your alleged ability to make these statements.

Please feel free to call if you have any questions. Thank you in advance for your cooperation.

Sincerely,

Alex N. Helperin

cc: Dennis Dickerson

[1] See letter from Daniel Rix, City Engineer, Pasadena Public Works and Transportation Dep't, to Dennis Dickerson, Executive Director, California Regional Water Quality Control Board, Los Angeles Region (Jan. 13, 2000).

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COUNCIL

January 24, 2000

VIA FACSIMILE (213/576-6660) and *Hand Delivery*

Dennis Dickerson
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: January 26, 2000, Regional Water Quality Control Board Hearing Public Comment Protocol

Dear Mr. Dickerson:

On behalf of the Natural Resources Defense Council ("NRDC"), Heal the Bay, and the Santa Monica BayKeeper, we write in response to your January 21, 2000 letter re "Procedure for Public Comment on January 26, 2000" (the "Proposal"). We find the Proposal to be confusing, unworkable, and implicitly to suggest that, depending on the relative number of speakers for each position, some members of the public may not be given an opportunity to address the Board, as required by the federal regulations regarding public participation. See, e.g., 40 C.F.R. Part 25. Perhaps most significantly, we find the proposed initial thirty-minute period to be problematic. This is true for multiple reasons, not the least of which is that characterizing one's position as "in favor" or "in opposition" may well be misleading and is likely to create an artificial division of speakers into two groups which are neither internally consistent nor in opposition to each other.

Accordingly, we request the following:

(1) An opportunity to present a combined 20-minute presentation to the Regional Board; and

(2) Assurances that every member of the public who desires to be heard will have an independent opportunity to address the Board.

For obvious reasons, we need to know how the Board intends to proceed on Wednesday as soon as possible. Please contact us by the close of business on Monday, at (213) 934-6900, to apprise us of your decision on this matter. I look forward to speaking with you soon.

Sincerely,

Alex N. Helperin

R0069577

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NATURAL RESOURCES DEFENSE COUNCIL

January 24, 2000

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VIA FACSIMILE (213/576-6660) and *Hand Delivery*

Dennis Dickerson
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: January 26, 2000, Regional Water Quality Control Board Hearing Public Comment Protocol

Dear Mr. Dickerson:

On behalf of the Natural Resources Defense Council ("NRDC"), Heal the Bay, and the Santa Monica BayKeeper, we write in response to your January 21, 2000 letter re "Procedure for Public Comment on January 26, 2000" (the "Proposal"). We find the Proposal to be confusing, unworkable, and implicitly to suggest that, depending on the relative number of speakers for each position, some members of the public may not be given an opportunity to address the Board, as required by the federal regulations regarding public participation. See, e.g., 40 C.F.R. Part 25. Perhaps most significantly, we find the proposed initial thirty-minute period to be problematic. This is true for multiple reasons, not the least of which is that characterizing one's position as "in favor" or "in opposition" may well be misleading and is likely to create an artificial division of speakers into two groups which are neither internally consistent nor in opposition to each other.

Accordingly, we request the following:

(1) An opportunity to present a combined 20-minute presentation to the Regional Board; and

(2) Assurances that every member of the public who desires to be heard will have an independent opportunity to address the Board.

For obvious reasons, we need to know how the Board intends to proceed on Wednesday as soon as possible. Please contact us by the close of business on Monday, at (213) 934-6900, to apprise us of your decision on this matter. I look forward to speaking with you soon.

Sincerely,

Alex N. Helperin

R0069578

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

January 24, 2000

Via Facsimile 562/436-1579

Lisa Peskay Malmsten
Deputy City Attorney
Office of the City Attorney
City Hall
333 West Ocean Blvd., 11th Floor
Long Beach, CA 90802-4664

Dear Ms. Malmsten:

We have received a copy of your letter of January 14, 2000, regarding the Los Angeles Regional Water Quality Control Board's December 7, 1999, Standard Urban Stormwater Mitigation Plan proposal (the "Proposal"). In the letter, you have indicated that the city of Long Beach (the "City") opposes the Proposal. Pursuant to the California Public Records Act (California Government Code Sections 6250 *et seq.*), we hereby request that you immediately forward us the City Council resolution expressing this position on behalf of the City.

Please feel free to call if you have any questions. Thank you in advance for your cooperation.

Sincerely,

Alex N. Helperin

cc: Dennis Dickerson

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NATURAL RESOURCES DEFENSE COUNCIL

January 24, 2000

Via Facsimile 310/379-9268

Bob Pinzler, Chair
South Bay Cities Council of Governments
5033 Rockvalley Road
Rancho Palos Verdes, CA 90275

Dear Mr. Pinzler:

We have received a copy of your letter of December 20, 1999, enclosing a South Bay Cities Council of Governments ("South Bay COG") resolution urging the California Regional Water Quality Control Board, Los Angeles Region ("LA-RWQCB") "to defer inclusion of numeric standards" in its Standard Urban Stormwater Mitigation Plans (the "Resolution"). The Resolution indicates that South Bay COG represents sixteen member cities and that it is on behalf of those members cities that the South Bay COG urges the LA-RWQCB to defer on the issue of numerical standards.

However, at least one of your member cities – the City of Rancho Palos Verdes – has written its own letter in substantial *support* of the inclusion of numerical standards.[1] This inescapable contradiction suggests that you may have misrepresented your members to the LA-RWQCB.

Accordingly, and pursuant to the California Public Records Act (California Government Code Sections 6250 *et seq.*), we hereby request that you immediately forward us the authorizing resolutions of each member city, on which you base your alleged ability to make these statements.

Please feel free to call if you have any questions. Thank you in advance for your cooperation.

Sincerely,

Alex N. Helperin

cc: Dennis Dickerson

[1] See letter from Dean Allison, Director of Public Works, City of Rancho Palos Verdes, to Dennis Dickerson, Executive Officer, California Regional Water Quality Control Board (Jan. 4, 2000).

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NRDC
Natural Resources Defense Council

January 24, 2000

Via Facsimile 323/588-2761

Samuel Kevin Wilson, P.E.
Director of Community Services & Water
City Hall
4305 Santa Fe Avenue
Vernon, CA 90058

Dear Mr. Wilson:

We have received a copy of your letter of January 14, 2000, regarding the Los Angeles Regional Water Quality Control Board's December 7, 1999, Standard Urban Stormwater Mitigation Plan proposal (the "Proposal"). In the letter, you have indicated that the city of Vernon (the "City") opposes the Proposal. Pursuant to the California Public Records Act (California Government Code Sections 6250 *et seq.*), we hereby request that you immediately forward us the City Council resolution expressing this position on behalf of the City.

Please feel free to call if you have any questions. Thank you in advance for your cooperation.

Sincerely,

Alex N. Helperin

cc: Dennis Dickerson

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FAX TRANSMISSION

TO THE ATTENTION OF: Xavier Swamikannu

ORGANIZATION/COMPANY:

FAX NUMBER:

FROM: Alex McSperin

MESSAGE:

NUMBER OF PAGES: 23 INCLUDING COVER SHEET

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NRDC 6310 SAN VICENTE BLVD. SUITE 250 LOS ANGELES, CA 90048

R0069582

NATURAL RESOURCES DEFENSE COUNCIL

January 14, 2000

VIA FACSIMILE (w/o enclosures) and *U.S. Mail*

Executive Officer and Members of the Board
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Proposed Model Standard Urban Storm Water Mitigation Plans (SUSMPs)
Los Angeles County Municipal Stormwater Permit (NPDES No. CAS0061654)

Dear Mr. Dickerson and Members of the Board:

The Natural Resources Defense Council ("NRDC") is a national environmental organization with over 400,000 members, approximately 35,000 of whom live within the Los Angeles region. NRDC has reviewed the "Proposed Standard Urban Storm Water Mitigation Plan" (the "Proposal") issued on December 7, 1999 as a proposed "model program" of the Los Angeles County Municipal Storm Water Permit (the "Los Angeles Permit"), and as the remaining unfinished element of the Long Beach Municipal Storm Water Permit (the "Long Beach Permit"). We submit the following comments[1] on behalf of NRDC, Heal the Bay, the Santa Monica BayKeeper, and their respective members (collectively, "NRDC").

Introduction

NRDC Position

While NRDC strongly supports the Regional Board Staff's retention of the 0.75-inch numerical standard initially embraced in its August, 1999 proposal, we are extremely disappointed that Staff has included a host of exceptions, exemptions, and general limitations on the scope of the program that, collectively, render that numerical standard virtually meaningless. Taken as a whole, these limitations so severely undermine the impact of the numerical standard that it is genuinely questionable whether that standard will ever actually be effectuated. It appears that the Regional Board Staff ("Staff") has maintained the numerical standard only as a token concession to the requirements of the Clean Water Act, while essentially capitulating to the cries of those municipalities who are reflexively opposed to the idea of having to implement such a standard.

R0069583

[1] In addition, NRDC joins in the comments submitted by Heal the Bay, in its letter of January 14, 2000, and those submitted by the Santa Monica Mountains Conservancy, in its letter of December 16, 1999. We also hereby incorporate our previous comments, submitted with our letter of September 9, 1999 ("September Letter"), attached hereto (without exhibits) as Exhibit A, which, in turn, incorporated the comments submitted by the Santa Monica BayKeeper on the same date, and those submitted by Heal the Bay on September 7, 1999.

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The SUSMP should function like any other type of building code, with its requirements applying equally to ministerial development projects and to discretionary ones. It should simply become a part of the set of requirements that apply automatically to any new development.

Request: Los Angeles County removed the limitation to "discretionary" projects from its program, and we strongly encourage the Regional Board to do the same.

Problem #3: The Proposal is Rife with Exemptions, Exceptions and Overly-Restrictive Definitions

(a) Remove the Roofing Exclusion

The significance of the numerical standard is greatly diluted by the insertion of a "rooftop exclusion" that was introduced directly by the Executive Officer without any technical support or precedent. Section 9 of the current Proposal would allow developers to divert runoff from roof tops directly to the storm drains and to take credit for that volume of runoff as if it were being treated. Such an exception would be directly contrary to the purpose of the SUSMPs. Not only would it allow treatment of less runoff, but it would actively encourage developers to increase the amount of impervious surface (in the form of roof tops) built into the development process. That is because every additional inch of roof top would enable developers to build smaller BMPs and direct more runoff straight to the stormdrains. We are aware of no similar exclusion in any program anywhere in country. **The provision is nonsensical. It would function as an affirmative attack on environmental protection and must be removed.**

Staff appears to believe that roof-top runoff will not be contaminated, thus making it appropriate to send this runoff directly into the stormdrain and reduce the volume of runoff treated on-site. The Proposal does include a few provisions to ensure that some of the most obvious contaminating influences on roof tops are not present, such as roof-based exhaust systems and air pollution control devices; however, these protections are inadequate, and, more significantly, they do nothing to address the larger issue that this exemption creates incentives directly contrary to the purpose of a stormwater management system. The following paragraphs explain each of these points in more detail.

First, the only safeguard against pollution in the rooftop runoff is the limitation of the exclusion to cases in which: (1) "roofing materials will not be a source of pollutants of concern;" and (2) "roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollution." Proposal at 9. The Proposal neither explains who will make these determinations, nor how they will be made. There is no explanation of what it means for roofing materials to be a source of pollutants of concern; there is no definition of "significant source of pollution" or guidance for assessing whether the structures at issue would act as such a source. Because of the vagueness of this exclusion, it provides essentially no protection against polluted roof-top runoff flowing freely into the storm system, exempt from all the otherwise-applicable treatment requirements.

Second, the Proposal makes no provision for public notice or comment on these decisions. Thus, it opens the door for decision-making that could significantly undermine the effect of the numerical standard, and that would do so without the ability for any public review or accountability. This violates Clean Water Act public participation requirements. See 40 C.F.R §§ 25.3, 25.4, 124.5(c), 122.62, and Part 124; see also Hampson v. Superior Court, 67 Cal. App. 3d 472, 484 (1977) (granting of discretionary exemption requires regional board review).

Third, there is no protection against, or even recognition of, the potential polluting effects of aerial deposition. Studies are underway to assess the significance of this source of pollution, but the Proposal effectively prejudges the results of these studies and encourages developers to increase the area of roofing, thus increasing the amount of runoff sent directly to the stormdrains laden with any pollutants that have settled on those roofs. The aggregate amount of pollution from these roof tops may well be a significant contributor to the pollution in our receiving waters and may prevent municipal governments from meeting their responsibilities to reduce the pollution entering the receiving waters from the ends of their storm drains. It will undoubtedly make meeting those requirements more difficult. Still, the proposal completely discounts, or ignores, this source of stormwater pollution, and thus is arbitrary and capricious and without any support in the record.

Fourth, even if the water could be proved to be pristine, this provision encourages additional flow problems and a further deviation from the natural water cycle. A stormwater management program must take into account both water quality *and* water quantity concerns. A comprehensive management plan considers the entire hydrologic cycle, including infiltration and evaporation, and does not simply focus on getting rid of the water as quickly as possible. See "Storm Water: Asset or Liability," S. Dallman and T. Piechota (Dec., 1999), attached hereto as Exhibit D, see, also, "Stormwater Infiltration," B. Ferguson, 1998, presented at Urban Storm Water Management in the Southwest Conference sponsored by U.S.E.P.A., Long Beach, California, attached hereto as Exhibit E. In 1928, only five percent of the rainfall in the Los Angeles area translated into runoff in the Los Angeles River. In the 1990s, that ratio has reached fifty percent. "Storm Water: Asset or Liability" at 8. If we continue to increase the amount of rainfall that we convert to runoff, at the same time development continues to increase, we will not only exacerbate our existing water quality problem, but we will also create a flood control threat that is beyond the capacity of our current flood control system to handle.

In sum, this exclusion is riddled with problems. It will reduce, if may totally eliminate, the pollution-control benefit that the numerical standard would otherwise provide. It will encourage environmentally destructive design practices. It will subvert public accountability. And it will exacerbate our flood control problem. **This exclusion must be removed.**

(b) Modify "Retail Gasoline Outlet" definition, as specified below

The Proposal states that gas stations with associated convenience stores are to be classified based on their "primary" activity. Proposal at 3. A huge percentage of gas stations today have convenience stores associated with them. These gas stations have just as much potential to generate stormwater pollution as gas stations without associated convenience stores, and there is no reason why a gas station should be able to avoid compliance with stormwater regulations by adding in a convenience store.

Furthermore, like the roofing exclusion, this provision provides no guidance on how to determine a facility's "primary activity." Without any limitations on that phrase, this exemption could quickly become an avenue to relieve most gas stations from the requirements of the SUSMP. **Any pumping station, regardless of whether it has an associated convenience store, should have to meet the requirements of this SUSMP.**

Finally, we note that definitional limitations such as this one and the ones discussed in the following two sections are particularly troubling because they do not simply relieve the excluded facilities from the requirements of the numerical design standard; they seem to remove those facilities from *any* of the facility-specific requirements enumerated in section 10, see Proposal at 9-12. Consequently, even the most basic design requirements of that section, such as the requirement to cover fueling areas, would not apply. There is no excuse for removing such basic requirements.

(c) Change the "Hillside" definition, as specified below

The Proposal establishes three criteria, all of which must be satisfied, for an area to qualify as a "hillside." The definition is both overly restrictive and dangerously vague. Los Angeles County's stormwater management program lists three similar criteria, but meeting *any one* of these three criteria suffices to qualify as a "hillside." Furthermore, criteria such as "erosive soil conditions" are defined in the Los Angeles County program, whereas the current Proposal provides absolutely no guidance for determining whether soil conditions are erosive, nor does it specify who would make such a determination.

Request: This definition should be modified to read as follows: "'Hillside' means property located in an area that has any of the following characteristics, or where the planned development has any of the following characteristics:

"location in an area known to have erosive soil conditions as identified in the *Los Angeles County Department of Public Works Hydrology/Sedimentation Manual*;

"grading will occur on any natural slope where the natural slope is 15% or greater; or

"plans include cut or fill slopes that are 30 feet high or greater."

(d) Modify "Automotive Repair Shop" definition, as specified below

The Proposal defines automotive repair shops based on standard industrial classifications (SIC codes). Proposal at 3. In so doing, it provides exceptions for SIC codes 5013 (essentially wholesale parts suppliers), 5014 (wholesale tire suppliers), and 5541 (retail gas stations) that are unnecessarily and unacceptably broad, as well as being vague in many cases. For example, facilities providing supplies and new parts (code 5013) are exempted as long as they do not store hazardous substances or recycled oil outside; however, the definition does not define "hazardous substances," a term that has different meanings in different contexts even within the area of water quality law. The phrase should be defined to include any substance designated in 40 C.F.R. part 116, pursuant to section 311 of the Clean Water Act, which is how it is defined for the NPDES program generally. See 40 C.F.R § 122.2.

Moreover, there are many types of automotive-related supplies that may not qualify as hazardous substance, but that may nevertheless contribute pollutants of concern to the receiving waters if left outside to come in contact with runoff. Any outside storage of automotive supplies should suffice to impose the requirements related to automotive repair shops on this category of facility.

Similarly, tire and tube suppliers (SIC code 5014) are excluded from categorization as "automotive repair shops" as long as they do not engage in repair work. This should be clarified to include tire and tube installation and should include the outside storage of other automotive supplies or hazardous materials as well.

Finally, the Proposal excludes retail gasoline stations (SIC code 5541) as long as they do not perform any onsite repair work. They should only be excluded if they meet all of the prior criteria, meaning they not only do they perform no onsite repair work, but they do no installation of new parts or upgrades, and they do not store any hazardous substances (properly defined) or other automotive supplies outside.

Request: Modify the exceptions provided for facilities with SIC codes 5013, 5014, and 5541 so that they are excepted *only* if they perform none of the pollution-producing activities described above.

(e) Remove the small restaurant exemption

Section 9 of the Proposal concludes by completely excluding small restaurants (those of less than 5,000 square feet) from the BMP sizing requirements. However, there is no necessary correlation between the size of a restaurant and the amount of pollution it produces. A small restaurant can produce much greater storm water pollution than a large one, depending on the materials they use and their source control practices. All restaurants should be required to meet the same standards with respect to the runoff generated by their sites. Because smaller sites generate less runoff, the burden on them will automatically be proportionately smaller.

Second, the failure to provide a means for public review and comment violates federal regulations applicable to state NPDES programs. Federal law requires that any change to an NPDES permit that does not meet one of the criteria for a "minor modification" must go through public notice and comment proceedings. 40 C.F.R. § 122.62 and 122.63. The granting of an exemption for other than purely factual reasons can constitute a permit modification. Cf. Hampson v. Superior Court, 67 Cal. App. 3d 472, 483-84 (1977).

Third, the delegation of such authority to the Executive Officer, without any provision for Regional Board review, violates the limitations on the Regional Board's ability to delegate its duties. See Cal Water Code § 13223. This statute prohibits the Regional Board from delegating its power to modify waste discharge requirements ("WDRs"). The SUSMP is a provision of an NPDES permit and of a WDR. Furthermore, in a similar situation, Hampson specifically held that, although a regional board resolution could authorize the board's executive officer to make a *preliminary* determination regarding one's eligibility for an exemption, the regional board still had the power *and duty* to review that determination if it would constitute a modification of the waste discharge requirement. Id.

In sum, this waiver provision, which could exempt an unlimited number of developments, is illogical, unwise, and, as written, illegal. **The provision must be significantly modified, if not removed.**

Request: Modify this provision to allow dischargers to seek variances for a showing of impracticability made to, and approved by, the Regional Board.

Problem #5: The SUSMP Should not Allow Self-Certification of Compliance

Section 13 allows developers to certify that they have complied with the requirements of this SUSMP, thus avoiding any municipal or Regional Board review of their development plans. Proposal at 13. Such a provision would be an abdication of the Regional Board's responsibilities under the stormwater program, and **this provision should be removed.** In no other area does the Regional Board allow the regulated community to completely remove itself from regulatory oversight. At a minimum, there must be a mandatory spot checking system so that municipalities retain some sort of oversight over these otherwise-completely unregulated developments.

This section also states that the Executive Officer will decide on the acceptable training and curriculum. This, too, exceeds the Regional Board's authority to delegate duties to the Executive Officer. Just as model programs under the Los Angeles Permit had to come back before the Regional Board for approval, any training program proposed by the Executive Officer as an element of this permit's requirements must be approved by the Regional Board before it is effective.

Problem '6: The Section on Conflicts with Local Practices Vitiates the Proposal

Finally, page 5 of the Proposal allows local practices to override the requirements of the SUSMP as long as the local practices would not "defeat or circumvent the intent of the SUSMP requirements." This vague standard is, once again, an invitation for abuse. Since the cover letter describes the purpose of the SUSMP as being "to ensure that storm water pollution is addressed . . . by incorporating [BMPs] in the design phase of new development and redevelopment," one could interpret this exemption as allowing local practices to trump the requirements of the SUSMP as long as they require the incorporation of *some* BMPs in the design phase. Since this is already required under the general development planning program adopted by the Regional Board in January of 1999, this may vitiate the entire SUSMP.

The SUSMP requirements should be implemented like any other program. There is no reason why inconsistent existing practices should trump the SUSMP. **This provision must be eliminated.**

Conclusion

In sum, Staff has proposed a host of alternatives, exemptions, and limitations that, as a whole, threaten to completely negate all of the benefits that the numerical design standard would otherwise produce. There is no justification for retreating from that design standard or providing a series of "back doors" through which developers can avoid it. The proposed standard is entirely reasonable. Indeed, as the following section demonstrates, it is far less restrictive than the standards being adopted by hundreds of other municipalities all over the country. If anything, it should be stronger.

The Proposed Numerical Standard is Necessary and Entirely Reasonable

This is the second time that Staff has recommended the inclusion of a numerical standard within the SUSMP to guide BMP-design and ensure adequate mitigation of stormwater pollution in development planning. Furthermore, Staff **both times** proposed that the numerical standard to be included should be based on the 85th percentile 24-hour runoff event and on the maximized capture storm water volume for the area, or, in the alternative, a 0.75-inch storm size standard. See Proposal § 9.A, at page 8, and Public Notice No. 99-047 (Aug. 16, 1999) at 2-3. This is the minimum acceptable standard for development planning in the Los Angeles area,[3] and it provides a good starting point for the implementation of this aspect of the Los Angeles and Long Beach Permits.

NRDC also recognizes that the current Proposal provides two additional methods for calculating the exact standard to be applied to any given development. See Section 9.A. Thus, Staff has provided maximum flexibility to developers and municipalities while still ensuring a minimally-adequate level of mitigation of stormwater pollution. **NRDC supports the use of this numerical standard and its formulation in the current Proposal.**

The first section below provides a sense of just how reasonable the proposed numerical standard is in comparison to other programs being implemented across the country. It also relays the results of a survey of similarly-structured programs that are being implemented in thirty-two different geographical areas around the country.

The other two sections address concerns that were raised by several municipalities at the September 16, 1999 hearing regarding the technical effectiveness, and the *cost*-effectiveness, of the BMPs in the program. Their complaints generally took the form of alleging – without any evidence – that there was a lack of data to support the use of these BMPs. As we demonstrate below, this claim is completely fallacious, as there is, and has been for years, an incredible wealth of data supporting both the effectiveness, and the cost-effectiveness, of these BMPs.

In responding to these municipalities' concerns, it bears repeating that the selection of BMPs is **not even at issue** in this proceeding, as the Regional Board has already adopted a list of BMPs for the development planning program under the Los Angeles Permit. See Regional Board Resolution No. 99-03, April 22, 1999, attached as Exhibit F. Thus, the Regional Board has already determined that the BMPs in this program are both cost-effective and appropriate. We nevertheless review the wealth of data regarding the effectiveness and cost-effectiveness of the structural BMPs approved by the Regional Board last April, in response to these concerns.

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[3] As indicated in the September Letter, NRDC believes that the threshold should actually be higher. We believe that new development projects should be designed to mitigate all the runoff generated by storms of up to either 1.0-inch or the size of a one-year, 24-hour storm, whichever is greater. Many areas around the country use a 1.0-inch standard, many others use the six-month or one-year, 24-hour storm standard; and still others require BMPs in new and redevelopment to be designed with sufficient capacity to ensure that they capture 90% of the stormwater generated. See, e.g., Table 1, on page 13. Given the hydrology of the Los Angeles area, any of these standards would translate to at least a 1.0-inch storm.

Hundreds of Municipalities Across the Country Use Similar or Stronger Standards

At the September 16, 1999, hearing at which the Regional Board heard testimony on this issue, representatives of several municipalities, as well as the building industry, decried the alleged difficulties of implementing the proposed numerical standard and the alleged hardships that would befall them and (in the case of the municipalities) their constituents, if this standard were to be adopted. None of the speakers presented any evidence in support of their "parade of horrors" scare tactics. Instead, they simply – and incorrectly – implied that there was no basis for the standard that Staff had recommended.

As we showed in great detail in our September Letter, not only was there a basis, but a technically-sound, environmentally-critical basis for adopting a standard at least as stringent as the one proposed by Staff. Furthermore, there are literally hundreds of municipalities across the country already employing such standards.

Many municipalities have structured their standards in ways that make them difficult to compare. However, one of the nation's leading experts in stormwater management engineering, Dr. Richard Horner, has noted that, although there are myriad ways of articulating a standard for BMP design, in his professional judgment, "the majority of municipalities that have a numerical standard [such as the one listed in the current Proposal] have a **more stringent one than Los Angeles County's**." See Supplemental Declaration of Richard R. Horner ("Horner Suppl. Decl.") ¶ 7, attached hereto as Exhibit G (emphasis added). And in fact, **three of the Nation's leading stormwater experts have all submitted affidavits or letters supporting the use of this standard**. See Exhibit H.

Moreover, the legal standard for municipal stormwater pollution management requires that this Development Planning program be structured so as to reduce pollutants in stormwater to the "maximum extent practicable." 33 U.S.C. § 1342(p)(3)(B)(3); Los Angeles Permit, Part II, at page 12. Given this standard, the fact that other municipalities are implementing more stringent standards, **in and of itself**, should suffice to show that this is a practicable option and therefore **must** be implemented.

Presented below, in Table 1, is a partial listing of several hundred municipalities around the country that employ more stringent standards than the one currently proposed by Staff. Table 2 lists additional municipalities that employ equally stringent or more stringent standards, depending on the situation. This list is by no means comprehensive – it comes from an academic survey of 32 city, county, regional, and state programs[4] – however, it serves as an indication of how common the proposed approach is.

[4] Institutional Aspects of Urban Runoff Management: A Guide for Program Development and Implementation, Watershed Management Institute, Inc. (1997).

Table 1 – Standards Exceeding the Los Angeles County Standard of Runoff from the First 0.75 Inches of Rain:

Municipality or Municipalities	Design Standard for Treatment Control BMPs	Equivalency to Standard Proposed for Los Angeles
All municipalities in the "Puget Sound Basin," which encompasses a 12-county region, and **well over 100 individual municipalities**.	Runoff from 6-month, 24-hour rainfall.	**1.2 inches** for the Seattle area; a similar amount in most other highly urbanized areas (A few smaller urban areas have either heavier or lighter rainfall, but all have a standard exceeding Los Angeles County's.)
Clark County, Washington	Runoff from 6-month, 24-hour rainfall.	Approximately **1.2 inches**.
State of New Jersey **(all municipalities)**	Runoff from first 1.25 inch of rainfall occurring in 2 hours, or runoff from 1-year, 24-hour rainfall event, whichever is greater.	**1.25 inches or greater**
State of Delaware **(all municipalities)**	First 1 inch of runoff	**Greater than 1.0 inch**
State of Maryland (proposed new standard for **all municipalities**)	Runoff from 90% of average annual rainfall	Approximately **1 inch** of rain in most places in the state.
Northeast Illinois Planning Commission (Metropolitan Chicago)	Runoff from first 2 inches of rainfall (except runoff from 6-month [unstated duration] rainfall event for swales)	**2.0 inches**, except for swales, which could be more or less.
Austin, TX	First 0.5 inch of runoff + 0.1 inch of runoff for every 10% of impervious area above 20%	**1.3 inches or greater**.

Orlando, FL	First 0.5 inch of runoff, or runoff from first 1 inch of rainfall, whichever is greater.	**1 inch or greater**.
Winter Park, FL	First 1 inch of runoff	**Greater than 1 inch**.

Table 2

Standards Exceeding the Los Angeles County Standard (Runoff from First 0.75 Inches of Rainfall) Under All or Most Circumstances:

Municipality or Municipalities	Design Standard for Treatment Control BMPs	Equivalency to Standard Proposed for Los Angeles
Florida (Water Management Districts and municipalities that have not adopted their own standard)	First 0.5-1.5 inch of runoff, depending on BMP, receiving water, and impervious fraction.	Greater than 0.5, almost always greater than .75, and often above 2.0.
South Florida Water Management District (Miami-West Palm Beach metropolitan areas)	Runoff from first 1.0-2.5 inches of rainfall (depending on impervious fraction) multiplied by impervious fraction.	Almost always greater than 0.75
Suwanee River Water Management District, FL	First 0.5-2 inches of runoff, depending on BMP, receiving water, and impervious fraction	Usually greater than 0.75
State of Virginia	Basic treatment volume is first 0.5 inch of runoff, but wet pond is to have wet pool volume = 3 times basic treatment volume	Usually greater than 0.75, and always greater than 0.75 for wet pools.

The Relevant BMPs Have Repeatedly Been Shown to be Highly Effective

Another concern raised by several municipalities at the September 16, 1999 hearing, was over the effectiveness of the BMPs. There is no doubt that structural BMPs are a highly effective means of controlling stormwater pollution, and any uncertainty regarding the effectiveness of individual or specific BMPs has been substantially reduced by the myriad technical studies that have been performed on this subject. Indeed, contrary to the claims of several municipal representatives at the September 16, 1999 hearing, EPA has recently noted that "[t]here has been a great deal of published data documenting the efficiency of BMPs in removing pollutants from storm water." Preliminary Data Summary of Urban Storm Water Best Management Practices, EPA (Aug., 1999) ("EPA Study") at 5-50. In fact, there have been "[s]everal nationwide monitoring programs . . . to evaluate the performance of storm water BMPs," as well as data in the professional literature and "a large amount of data . . . collected by various cities and municipalities as part of the storm water permitting program." Id. at 5-46 – 5-48. Indeed, some of the data recounted below has been known for over 15 years, making the municipalities; claims perplexing. See, e.g., U.S. EPA, *Results of the Nationwide Urban Runoff Program (Volume 1-Final Report)*, December, 1983, at 6-1 – 6-64.

In addition, two separate groups have developed databases on the issue of BMP effectiveness. "The Center for Watershed Protection ... has prepared a database containing BMP performance data for 123 structural BMPs," id. at 5-47, and the American Society of Civil Engineers ("ASCE") has developed what EPA refers to as "a comprehensive database on BMP performance." www.epa.gov/OST/stormwater, visited on Dec. 10, 1999. The Center concluded that "there is enough data to select specific BMP groups on the basis of their comparative ability to remove specific pollutants." "Comparative Pollutant Removal Capability of Urban BMPs: A Reanalysis," Watershed Protection Techniques; Vol. 2, No. 4, June 1997, Technical Notes – Stormwater BMPs; Technical Note 95 at 520.

Although a complete literature review and summary is beyond the scope of this letter, the attached excerpt from Fundamentals of Urban Runoff Management: Technical and Institutional Issues, R. Horner, J. Skupien, E. Livingston, and H. Shaver (Aug., 1994), see Exhibit I, reports the results of several in-depth studies on BMP effectiveness. The information is provided as exemplary of the sort of data that has been generated regarding the effectiveness of BMPs. It is by no means the only source of information on the subject. It is but one example of the sort of detailed information that has been developed to characterize the effectiveness of structural BMPs. Some of the conclusions of the report are summarized below. Additionally, Table 5-7 from the EPA Study, attached hereto as Exhibit J, reports similar pollutant removal levels for total suspended solids, nitrogen, phosphorus, pathogens, and metals, for 10 types of BMPs.

All of the BMPs listed below are on the Regional Board's list of approved BMPs for use in the Development Planning Program under the Los Angeles Permit. See Regional Board Resolution No. 99-03, attached as Exhibit F. Thus, the following data directly reflects the effectiveness of the existing program.

A. Wet ponds

EPA's Nationwide Urban Runoff Program ("NURP") performed a comprehensive investigation of pond design and performance. Performance was found to relate best to volume ratio (the ratio of pool storage volume to mean storm volume). Total suspended solids ("TSS") reductions were found to reach 100% with sufficient volume ratio. Similarly, lead reductions could be greater than 90%, phosphorus reductions greater than 60%, and copper and zinc reductions as high as 50%. Seattle's water quality design storm is equivalent to a volume ratio of approximately 2.5, which yields reductions in TSS of 75%, lead of over 70%, phosphorus of 50%, and copper and zinc of 40%. Fundamentals of Urban Runoff Management, R. Horner et al., Exhibit I, at 120-21.

B. Extended-Detention Dry Ponds

A 1990 study by Stahre and Urbonas analyzed several studies of long-term efficiencies for various pollutants and a 40-hour detention time. The researchers concluded that dry ponds under such conditions could remove 50-70% of TSS, 75-90% of lead, 50-90% of bacteria, 50-70% of hydrocarbons, 30-60% of zinc, 20-40% of chemical oxygen demand, and 10-20% of total phosphorus and total nitrogen. Id. at 122.

C. Vegetative Practices

A 1992 performance investigation in the Puget Sound area of Washington found grass swales can be effective in capturing solids, oils, and the least soluble metals. Over a six-storm period, the swale, with an average hydraulic residence time of nine minutes, removed an average of 83% of the TSS, 75% of oil and grease/TPH, 72% of iron, over 60% of the lead, turbidity, and T-Zn/T-Al, and even removed 30% of the *dissolved* zinc. Id. at 124.

D. Constructed Wetlands

Another 1992 study, by Strecker, considered more than 140 papers and reports and assembled detailed information on 18 locations within the United States. The study found median pollutant removals of 80.5% for TSS, 44.5% for ammonia-nitrogen (NH_3-N), 58% for total phosphorus, 83% for lead, and 42% for zinc. Id. at 128-29.

E. Sand Filters

Monitoring sand filters in Austin, Texas, Shaver reported expected pollutant removal efficiencies of 75-87% for TSS, 71-88% for lead, 49-82% for zinc, 19-61% for total phosphorus, and 36-37% for fecal coliform, among other pollutant parameters. Id. at 138.

F. Leaf Compost Filters

A leaf compost filter developed and tested by W and H Pacific (1992) showed influent event mean concentrations to be reduced, on average, by 95% in TSS, 84% in turbidity, 67%

chemical oxygen demand, 41% phosphorus, 88% zinc, and 87% total petroleum hydrocarbons, among other results. Id. at 139.

G. Catch Basin Filters

Before independent testing, "MacPherson reported concentration reductions of 90 percent for total suspended solids, 87 percent for lead, 77 percent for zinc, and 86 percent for copper." Id. at 139. Dr. Michael Stenstrom has also reported removal efficiencies of 50 to 90 percent for petroleum hydrocarbons, and up to 99 percent for sediments and trash. See Santa Monica Bay Restoration Project Catch Basin Study, 1998 (Michael Stenstrom, Ph.D., primary author).

H. Continuous Deflective Systems

Robin Allison, of the University of Melbourne, in Victoria, Australia, found continuous deflective systems, or CDS, to remove 70 to 85 percent of trash, vegetation *and* TSS. R. Allison, B.E., Ph.D., "Effectiveness of Two Stormwater Trash Trapping Systems" (1998). See Exhibit K.

I. Conclusion

There is an enormous body of detailed technical information regarding the efficiency of the various structural BMPs listed above. Because the BMPs listed above are part of the existing Development Planning program, see Regional Board Resolution No. 99-03, attached as Exhibit F, this data is directly on-point and completely supportive of the Board's decision to require that these BMPs be sized to work most effectively.

The data presented herein is also highly relevant because the pollutant parameters for which these structural BMPs have been tested – and for which they have proven to be the most effective – are the same pollutants for which the vast majority of the waters of this region are listed as impaired. The Los Angeles River, for example, is presently listed as being impaired by ammonia, coliform, lead, oil, and nutrients such as nitrogen and phosphorus, among other things, see 1998 California 303(d) List and TMDL Priority Schedule, approved by EPA, May 12, 1999 ("303(d) list") at 79-81, all of which can be effectively managed by the BMPS listed above. Even a casual review of the 303(d) list reveals that most of the contaminants listed above, including copper, lead, zinc, TSS, coliform, and nutrients, are ubiquitous problems in the Los Angeles area. Indeed, with the impending development of TMDLs for these impairments, the implementation above the above BMPS may actually soon be *mandated*.

There is Ample Data Regarding the Reasonable Costs of Structural BMPs

A. The Municipalities' Demands Regarding the Consideration of Costs Show a Fundamental Misunderstanding for the Structure of the Clean Water Act.

Several of the municipal representatives who spoke at the Regional Board's September 16, 1999, hearing on this issue complained that there was insufficient data on the costs of the

various BMPs to assess whether they should be required. If effectiveness is viewed as a measure of the benefit of a BMP, they argued that, even if we knew how effective the BMPs were, and therefore what the benefits are, the absence of cost data nevertheless meant that there was not enough data to justify the BMPs on a cost-benefit basis.

As an initial matter, it should be noted that a cost-benefit analysis is not required at this stage in the implementation of the Clean Water Act's stormwater management program. Costs, to the extent they are relevant at all, have been factored into the equation in designating the beneficial uses for the receiving waters. Once uses are designated for those water bodies, the Clean Water Act requires that sufficient controls be implemented on all sources of pollution to *assure* that those standards are attained. See, e.g., 33 U.S.C. § 1313(d)(1)(C); see, also, id. at § 1312(a). Also, once again, the BMPs at issue were selected and/or approved by the Regional Board nine months ago, see Exhibit F at 16-31, so their propriety is not in issue in this action. The only question before the Board is the appropriate sizing of the pre-approved list of BMPs that the municipalities must require of new and redevelopment regardless of how the Board acts on the instant issue.

Further, although the municipalities' objections do not relate to the propriety of adopting a numerical sizing standard, it is worth noting that this element – the development of SUSMPs with meaningful standards – is *mandated* by the Los Angeles Permit. The permit *requires* that SUSMPs and guidelines for their preparation be developed. Los Angeles Permit § III.A.1.c. It also states that, in order to implement a program for planning measures consistent with the SUSMPs, permittees "shall require that the project applicant submit an [USMP] appropriate and applicable to the project." Id. at § III.A.2. Thus, the permit requires the adoption of SUSMPs and envisions that the Regional Board will develop standards, such as the numerical standard at issue, to assessing the adequacy of the specific USMPs submitted by developers.

Finally, the statute itself, as well as the permit, requires that the Development Planning program be structured to reduce pollutants in stormwater to the maximum extent practicable. 33 U.S.C. § 1342(p)(3); Los Angeles Permit, Part II, at 12. Given the number of municipalities that are implementing more stringent sizing standards than this Regional Board is considering, see section above entitled "Hundreds of Municipalities Across the Country Use Similar or Stronger Standards," there can be no doubt that the standard before the Board is not impracticable.

B. The Economic Data is Plentiful

Even if a cost-benefit assessment were required at this stage, the municipalities' claim that there is some general dearth of economic data on the cost of BMPs is simply false. EPA's Preliminary Data Summary of Urban Storm Water Best Management Practices, supra at page 15, discusses the costs (and benefits) of stormwater BMPs, in chapter 6. Table 6-1, attached hereto as Exhibit L, lists typical base capital costs, in dollars per cubic foot of treated water volume. Using that table, and even assuming 100% imperviousness, a one-half acre development would be required to spend between approximately $675 and $8,000 to construct and install a

sufficiently-sized structural stormwater BMP(s).[5] Similarly, a 10-acre complex could be required to spend as little as $13,500 or, using the most expensive BMPs, as much as $161,000.[6]

EPA goes on to note that, in part because of economies of scale, the costs of many BMPs will vary from these numbers as the sizes increase, making it useful to assess the total cost of typical applications of each BMP. Table 6-2, attached as Exhibit M, shows the costs for the same eight BMPs for 5- and 50-acre sites.[7] These amounts are likely to be only a small fraction of the overall costs to develop lots of this size. The Center for Watershed Protection concluded that "about a third of every dollar spent on stormwater pond construction was devoted to water quality control, with the remainder spend on flood control storage." "The Economics of Stormwater BMPs: An Update," Watershed Protection Techniques; Vol. 2, No. 4, June 1997; Technical Notes – Economics; Technical Note 90 at 496. Furthermore, the Regional Board Staff itself performed "BMP cost calculations for an actual site in Los Angeles in the process of development and determined that the mitigation criteria cost is **less than 0.5 percent of the project cost.**" Staff's "Summary of Comments Received and Response," Dec. 7, 1999, at 3.

In any event, the wealth of data regarding the costs of BMPs should put to rest the notion that such data is unavailable.

[5] 0.75 inches of rain on a 100% impervious surface would generate 0.75 inches (or 0.0625 feet) of runoff. One-half acre is 21,500 square feet. 0.0625 feet of water over 21,500 square feet yields 1,344 cubic feet of water, which, when multiplied by .5 to 6 (the approximate range of costs reported in Table 6-1) yields costs of between $672 and $8,064.

[6] Again assuming 100% imperviousness, since ten acres is 430,000 square feet, the site would yield 26,875 cubic feet of water. Multiplied by .5 and 6, that volume yields costs of $13,437 and $161,250.

[7] As EPA's data ranges from two to nine years old, these numbers should be adjusted for inflation, in addition to a further adjustment for regional factors.

Recommended Changes

The following is a proposed resolution for the Regional Board's adoption. Adoption of this resolution would affirm the well-supported numerical standard proposed by Staff while eliminating the exemptions and scope limitations that will undoubtedly hamper the effectiveness of this program.

The Regional Board hereby adopts the current Proposal from Staff with the following modifications:

1. Remove the roofing exclusion from section 9, on page 9.

2. Remove the final paragraph within section 9, which excludes small restaurants (those of less than 5,000 square feet) from the requirements established in that section.

3. Modify Section 11, on Waivers, to allow dischargers to seek variances only upon a showing of impracticability made to, and approved by, the Regional Board, following adequate public notice and opportunity for public comment.

4. Remove section 13, allowing self-certification of compliance.

5. Remove the section on page 5 entitled "Conflicts with Local Practices."

6. Expand the scope of the program to include all the project and activity types covered by Los Angeles County's program, including removal of the limitation to discretionary projects, by doing the following: (a) change the sentence in the last full paragraph on page 2 of the Proposal from:

"This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit;" to read:

"This SUSMP applies to all project and activity types described in attachment 1;" and

attach the list from the Los Angeles County Stormwater Management Manual, see Exhibit C, as attachment 1.

(b) Remove the word "discretionary" from the beginning of the last line on page 2 of the Proposal.

(c) Remove the top paragraph from page 5, defining "Discretionary Project."

7. Modify the definition of "Retail Gasoline Outlet" on page 3 of the Proposal to say that any commercial facility that includes a pumping station qualifies as a retail gasoline outlet subject to the requirements applicable to such entities. If other facilities, such as convenience stores, are associated with the pumping station, the requirements for gas stations only apply to the area around the pumping station, which will be the greater of the area 50 feet outward from the outer-most pumping stations or half way to the associated facilities.

8. Modify the definition of "Hillside" on page 3 so that it reads as follows: "'Hillside' means property located in an area that has any of the following characteristics, or where the planned development has any of the following characteristics:

"location in an area known to have erosive soil conditions as identified in the *Los Angeles County Department of Public Works Hydrology/Sedimentation Manual*;

"grading will occur on any natural slope where the natural slope is 15% or greater; or

"plans include cut or fill slopes that are 30 feet high or greater."

9. Modify the definition of "automotive repair shop" as follows:

(a) Facilities with SIC code 5013 are exempted only if they do not store hazardous substances (meaning any substance designated in 40 C.F.R. part 116, pursuant to section 311 of the Clean Water Act), recycled oil, or automotive-related supplies, outside.

(b) Facilities with SIC code 5014 are excluded only if they do not engage in repair work or tire and tube installation and do not store automotive supplies or hazardous materials (defined as any substance designated in 40 C.F.R. part 116, pursuant to section 311 of the Clean Water Act) outside.

(c) Facilities with SIC code 5144 are excluded only if they meet all of the prior criteria, meaning they not only do they perform no onsite repair work, but they do no installation of new parts or upgrades, and they do not store any hazardous substances (as any substance designated in 40 C.F.R. part 116, pursuant to section 311 of the Clean Water Act) or other automotive supplies, outside.

* * *

Thank you for the opportunity to comment on the Regional Board Staff's proposed SUSMP for the Los Angeles and Long Beach Permits. If you have any questions regarding any of the above, feel free to contact Alex Helperin at (323) 934-6900.

Sincerely,

David S. Beckman
Senior Attorney
Natural Resources Defense Council

Alex N. Helperin
Attorney
Natural Resources Defense Council

Steven E. Fleischli
Executive Director
Santa Monica BayKeeper

Mark Gold
Executive Director
Heal the Bay

cc: Felicia Marcus, Regional Administrator, USEPA, Region IX
Winston H. Hickox, Secretary of Environmental Protection, Cal/EPA
Alexis Strauss, Director, Water Program, USEPA, Region IX

Enclosures

R0069601

January 11, 2000

Dennis Dickerson
Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Support for the 3/4 inch standard to reduce runoff from new and redevelopment

Dear Mr. Dickerson:

I recently have had the chance to review the standard urban stormwater mitigation plan for Los Angeles County and Cities in Los Angeles County. Treatment of the stormwater quality is an essential element for protecting local watersheds, and is widely used by many municipalities around the country. I strongly support the three-quarter inch runoff treatment standard based on past scientific research on the performance of stormwater best management practices. I have also enclosed a recent article on stormwater strategies for arid and semi-arid watersheds that may be helpful in adapting effective stormwater practices for your region.

Thank you for the opportunity to comment on the proposed stormwater mitigation plan. Adoption of the three quarter inch standard will help to protect the creeks and coastlines of Los Angeles from the impacts of stormwater pollutants, and represents a fair, equitable and achievable threshold for stormwater treatment.

Sincerely,

Thomas R. Schueler
Executive Director

cc Mark Gold

attachment

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Stormwater Strategies for Arid and Semiarid Watersheds

Draft: 7/12/99
Deb Caraco and Tom Schueler

Water supply and flood control have traditionally dominated watershed planning in arid and semiarid climates. Until recent years, stormwater quality has simply not been much of a priority for water resource managers in the West. This situation is changing rapidly, as fast growing communities are responding to both emerging water quality problems and new federal regulations. In particular, larger cities in the West have gradually been dealing with stormwater quality to meet the requirements of the first phase of EPA's municipal stormwater NPDES program. Soon, thousands more smaller communities will need to develop stormwater quality programs when the second phase of this national stormwater regulatory program is rolled out later this year.

At first glance, it seems ludicrous to consider managing the quality of stormwater in arid regions where storms are such a rare and generally welcome event-- sort of like selling ice cubes to Eskimos. The urban water resources of the Southwest, however, are strongly influenced by stormwater runoff and by the watershed development that increases it. Indeed, the flow of many urban streams in the Southwest is generated almost entirely by human activity – by urban storm flow, irrigation return flow and wastewater effluent. Thus, the quality of both surface water and groundwater in urbanizing areas of arid and semiarid regions of the Southwest is strongly shaped by stormwater.

For purposes of this article, arid watersheds are defined as those that receive less than the 15 inches of rain each year. Semiarid watersheds get between 15 and 35 inches of rainfall, and have a distinct dry season where evaporation greatly exceeds rainfall. By contrast, humid watersheds are defined as those that get at least 35 inches of rain each year, and often much more. There are many arid and semiarid watersheds, most of which are located in fast growing regions of the Western United States (Figure 1). Low annual rainfall, extensive droughts, high intensity storms and high evaporation rates are characteristic of these watersheds, and present many challenges to the stormwater manager. [Note: in some arid and semiarid watersheds, most precipitation falls as snow and evaporation rates are much lower. These watersheds are found in portions of Alaska and at higher elevations of the Rocky Mountains. Guidance on stormwater strategies for these dry but cold watersheds can be found in Caraco (1997)].

In this article, we review strategies for managing stormwater in regions of scarce water, based on an extensive survey of thirty stormwater managers from arid and semiarid regions. We explore how source control, better site design and stormwater practices can be adapted to meet the demanding conditions posed by arid and semiarid climates. We begin be examining the environmental factors that make stormwater management in arid and semiarid watersheds so unique and challenging. As a consequence, stormwater strategies for the West are often fundamentally different from those

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originally developed for more humid regions. Some of the fundamental differences are outlined in Table 1 and are described in detail below.

Table 1. The West is Different: Key Considerations in Arid and Semi-Arid Watersheds

Aquatic resources and management objectives are fundamentally different
Rainfall depths are much lower
Evaporation rates are much higher
Pollutant concentrations in stormwater are much greater
Vegetative cover is sparse in the watershed
Sediment movement is great
Dry weather flow is rare, unless return flows are present

Aquatic resources and management objectives are fundamentally different

To begin with, the rivers of arid regions are dramatically different from their humid counterparts. Some idea of these differences can be comparing the dynamics of an arid river to a humid one (see Box 1). The differences are even more profound for the smaller urban streams in arid watersheds. Indeed, it is probably appropriate to refer to them as gullies or arroyos rather than streams, since they rarely have a perennial flow of water. Many of the physical, chemical and biological indicators used to define stream quality in humid watersheds simply do not apply to the ephemeral washes and arroyos that comprise the bulk of the drainage network of arid watersheds. Without such indicators, it is difficult to define the qualities that merit protection in ephemeral streams. Clearly, the goals and purpose of stream protection need to be reinterpreted for ephemeral stream channels, and cannot be imported from humid regions.

In humid watersheds, the first objective for stormwater management is the protection of perennial stream protection, i.e., maintaining pre development flow rates, habitat conditions, water quality and biological diversity. By contrast, the objectives for stormwater management in most arid watersheds are ultimately driven either by the quality of a distant receiving water, such as a reservoir, estuary, ocean, or an underground aquifer. Witness some of the recent water quality problems in arid and semiarid watersheds of which stormwater is suspected to be the primary culprit – beach closures along the Southern California coast, trash and floatables washed into marinas in Santa Monica, nutrient enrichment in recreational reservoirs like Cherry Creek Reservoir in Denver and Town Lake in Austin, trace metals violations in the estuarine waters of San Francisco Bay, or concerns about the quality and quantity of groundwater recharge in aquifers of San Antonio and Austin. Usually, the only local concern is the need to prevent the loss of capacity of irrigation channels or storage reservoirs caused by sedimentation.

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Groundwater is a particularly valued water resource in arid and semiarid watersheds. Many fast-growing Western communities are highly reliant on groundwater resources, and it is becoming a limiting factor for some. On a national basis, groundwater provides 39% of the public water supply. In the arid and semiarid Southwest, however, groundwater sources comprise 55% of the water supply (Maddock and Hines, 1995). Consequently, these communities have a strong interest in both the recharge and protection of groundwater on which they depend.

Box 1

An Arid River Runs Through It

Consider, for a moment, the characteristics of the South Platte River as it runs through Denver, Colorado, as chronicled by Harris et al (1996). Flow in the South Platte river is extremely variable with a few thunderstorms and the spring snow melt causing a half dozen dramatic peaks in discharge. Normally, however, river flows quite low, falling below the average daily flow level some 354 days a year. Much of the flow in the South Platte has been spoken for, it has been estimated that river water is used and returned back to the river from three to seven times before it leaves the State (primarily due to upstream water appropriations for irrigation). Most of the time, the river's flow is sustained by municipal wastewater effluent flows, which contribute about 90% of the river's daily flow during most of the year. Indeed, without wastewater and irrigation flows, the river would frequently run dry (as it had prior to settlement). The river continues to strongly interact with groundwater, and much of the flow moves underground. The South Platte is very warm; with summer surface water temperatures exceeding 30 degrees Celsius (and fluctuate by as much as 15 degrees each day).

From a water quality standpoint, the South Platte frequently suffers from oxygen depletion, and has high concentrations of dissolved salts and nitrogen. Prior to settlement, the South Platte River was not believed to have riparian forest corridors, but in recent years, introduced species have become well established along many parts of the river. The quality of river habitat is generally regarded as poor, due to low flows, sandy, shifting substrates, and a lack of channel structure and woody debris. The river's channel continually changes in response due to extreme variations in both flow and sediment supply. These extremely variable conditions are not conducive to a diverse aquatic habitat for aquatic insects or fish. For example, fewer than a dozen fish species inhabit the South Platte River, as compared to thirty or more that might be found in a humid region.

Rainfall Depths are Much Smaller

Table 2 compares a series of rainfall statistics for eight arid, semiarid and humid cities and documents that it rarely rains in arid watersheds. For example, in the fast growing Las Vegas, Nevada region, rain greater than a tenth of an inch falls, on average, less than ten days a year. Not only does rain seldom fall, not much falls when it does. For example, 90% of all rainfall events in a given year are usually less than 0.50 to 0.80 inches in arid watersheds, compared to 1.0 to 1.5

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inches in humid watersheds. Consequently, the water quality storm for most arid watersheds is roughly half that of most semiarid and humid watersheds, which greatly reduces the size, land consumption and cost of structural practices that need to be built. In many cases, the entire water quality storm can be disposed of on-site through better site design, without the need for structural practices. It should be noted that there are some significant exceptions to this rule. Los Angeles, for example, experiences higher rainfall depths due to intense coastal storms in the winter, especially in el Nino years.

Table 2. Rainfall Statistics for Eight U.S. Cities (all units in inches)
Sources: NOAA, 1997; US DOC, 1975, CWP 1999

City	Rainfall Statistic					
	Annual rainfall	Days of Rain per Year	90% rainfall event	Annual evaporation rate	Two year, 24 hour storm	Ten Year, 24 hour storm
Washington, D.C.	38	67	1.2	48	3.2	5.2
Dallas, TX	35	72	1.1	66	4.0	6.5
Austin, TX	33	49	1.4	80	4.1	7.5
Denver, CO	15	57	0.7	60	1.2	2.5
Los Angeles, CA	12	32	1.3	60	2.5	4.0
Boise, ID	11	48	0.5	53	1.2	1.8
Phoenix, AZ	7.7	29	0.8	82	1.4	2.4
Las Vegas, NV	4	10	0.7	120	1.0	2.0

While intense storms cause flash flooding that is so characteristic of the West, it is also important to keep in mind that the depth of rainfall in these storms is smaller than that of semiarid and humid watersheds (Table 2). For example, the rainfall depth associated with the two-year storm in most arid watersheds ranges from 1.0 to 1.4 inches, which is roughly equal to the typical water quality storm for a humid watershed. Similarly, the rainfall depth for the ten-year storm in most arid watersheds ranges from two to 3 inches, which is roughly equivalent to the depth of a two-year storm in a

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semiarid or humid watershed. Consequently, stormwater managers in arid regions can fully treat the quality and quantity of stormwater with about a third to a half of the storage needed in humid or semiarid watersheds.

Even though the rainfall depths in arid watersheds are lower, watershed development can greatly increase peak discharge rates during rare flood events. For example, Guay (1996) examined how development had changed the frequency of floods in arid watersheds around Riverside, California. Over two decades, impervious cover increased from 9% to 22% in these fast-growing watersheds. As a direct result, Guay determined that peak flow rate at gaged stations for the two-year storm event had climbed by more than 100%, and that the average annual stormwater runoff volume had climbed by 115 to 130% over the same time span.

Evaporation Rates are Greater

The high evaporation rate is a great challenge in arid and semiarid watersheds. Low rainfall combined with high evaporation usually means that stored water will be lost water. In Las Vegas, for example, annual rainfall is a scant four inches, while pan evaporation exceeds ten feet (See Table 2). Consequently, it is virtually impossible to maintain a pond or wetland in an arid watershed without a supplemental source of water (Saunders and Gilroy, 1997, Technical Note 111). Evaporation also greatly exceeds rainfall for many months of the year in semiarid watersheds, and requires special pond design techniques.

Pollutant Concentrations in Stormwater are Higher.

The pollutant concentration of stormwater runoff from arid watersheds tends to be higher than humid watersheds. This is evident in Table 3, which compares event mean concentrations (EMCs) from five arid or semiarid cities to the national average for several common stormwater pollutants. As can be seen, the concentration of suspended sediment, phosphorus, nitrogen, carbon and trace metals in stormwater runoff from arid and semiarid watersheds consistently exceeds the national average, which is heavily biased toward humid watersheds. In addition, bacteria levels are often an order of magnitude higher in arid regions (Chang, 1999).

The higher pollutant concentrations in arid watersheds can be explained by several factors. First, since rain events are so rare, pollutants have a chance to really build up over time on impervious surfaces over time. Second, pervious areas produce high sediment and organic carbon concentrations because the sparse vegetative cover does little to prevent soil erosion in uplands and along channels when it does rain. The strong effect of upland and channel erosion can be detected when stormwater samples are taken from channels, but are less pronounced in stormwater outfall pipes.

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Table 3. Stormwater Pollutant Event Mean Concentrations in Arid and Semi-Arid Regions (Units: mg/l, except for metals which are in ug/l)

Pollutant	National	Phoenix, AZ	Boise, Idaho	Denver, Colorado	San Jose, California	Dallas, Texas
Source	(1)	(2)	(3)	(4)	(5)	(6)
Rainfall		7.1 inches	12 inches	13 inches	14 inches	28 inches
N	2-3000	40	15	35	67	32
TSS	78.4	327	116 *	384	258	663
BOD	14.1	109	89	nd	12.3	12
COD	52.8	239	261	227	nd	106
Total N	2.39	3.26	4.13	4.80	nd	2.70
Total P	0.32	0.41	0.75	0.80	0.83 #	0.78
Soluble P	0.13	0.17	0.47	nd	nd	nd
Copper	14	47	34	60	58	40
Lead	68	72	46	250	105	330
Zinc	162	204	342	350	500	540

References: (1): Smullen and Cave, 1998, (2) Lopes et al, 1995 (3) Kjelstrom, 1995 (computed) (4) DRCOG, 1983, (5) WCC, 1992 (computed) (6) Brush et al, 1995.
Notes: nd= no data, # = small sample size * = outfall pipe samples

Vegetative Cover is Sparse in the Watershed

Native vegetative cover is relatively sparse in arid and semiarid watersheds, and offers little protection against soil erosion. Irrigation is required to establish dense and vigorous cover, which may not be sensible or economical given scarce water resources. In addition, high flows released from storm drains frequently accelerate downstream erosion since channels are sparsely vegetated. Finally, many stormwater practices require dense vegetative cover to perform properly (e.g., grass swales are not feasible in arid watersheds, given the difficulty to establish and maintain turf).

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Sediment Movement is Greater

Stream channels in arid and semiarid watersheds move a lot of sediment when they flow. For example, Trimble (1997) found that stream channel erosion supplied more than two thirds of the annual sediment yield of an urban San Diego Creek. He concluded that the higher flows due to watershed urbanization had greatly accelerated the erosion of arroyos, over and above the increases caused by grazing, climate and riparian management. Channel erosion can be particularly severe along road ditches that experience higher stormwater flows, which not only increase sediment erosion but also creates chronic ditch maintenance problems.

Dry weather flows are rare, unless supplemented by return water.

Most small order streams in arid watersheds are gullies or arroyos that only flow during and shortly after infrequent storm events. As they urbanize, however, stream flow during dry weather flow can actually increase. Sources of dry weather flow include return flows from lawn and landscape watering, car washing, and surface discharges of treated wastewater. Mizell and French (1995) found that excess water from residential and commercial landscape irrigation and construction sites dewatering greatly increased rate and duration of dry weather flow in a Las Vegas Creek, and was sufficiently reliable to be the primary irrigation source for a downstream golf course.

Stormwater Strategies for Arid and Semi-Arid Watersheds.

Watershed managers need to carefully choose stormwater practices that can meet the demanding climatic conditions and water resource objectives in arid and semiarid watersheds. In general, most communities employ three broad strategies – aggressive source control, better site design, and application of "western" stormwater practices. Some of the key trends in each of these areas are described below.

Aggressive Source Control

The term source control encompasses a series of practices to prevent pollutants from getting into the storm drain system in the first place. The practices include pollution prevention, street sweeping, and more frequent clean outs of storm drain inlets. Each practice acts to reduce the accumulation of pollutants on impervious surfaces or within the storm drain system during dry weather, thereby reducing the supply of pollutants available for wash off when it rains.

Pollution prevention. Pollution prevention seeks to change behaviors at residential, commercial and industrial sites to reduce exposure of pollutants to rainfall. Almost all arid stormwater managers considered pollution prevention measures to be an integral element of their stormwater management program, on par with the use of structural stormwater practices (Caraco, 1997). Indeed, many

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NATURAL RESOURCES DEFENSE COUNCIL

September 9, 1999

VIA FACSIMILE (w/o enclosures)

Dr. Xavier Swamikannu
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Proposed Model Standard Urban Storm Water Mitigation Plans (SUSMPs)
Los Angeles County Municipal Stormwater Permit (NPDES No. CAS0061654)

Dear Dr. Swamikannu:

The Natural Resources Defense Council ("NRDC") has reviewed the "Standard Urban Storm Water Mitigation Plans submitted to the Executive Officer under the municipal storm water permit for Los Angeles County and Cities" (the "SUSMPs") and the Regional Board staff ("Staff") recommendation to the Executive Officer regarding approval of those SUSMPs. We hereby join in the comments submitted by Heal the Bay, in its letter of September 7, 1999, and in those submitted by the Santa Monica BayKeeper, in its letter of September 9, 1999, and also submit the following additional comments on behalf of NRDC and its members.

Introduction

The Center for Watershed Protection (the "Center") has noted that "[c]ommunities across the nation are finding that their water resources are degrading in response to growth and development." Rapid Watershed Planning Handbook (Center, Oct. 1998) at xiii, attached hereto as Exhibit A.[1] The Center's "four-year effort to examine new ways to reduce pollutant loads and protect aquatic resources" revealed that "a fundamentally different approach toward development [is] needed to reliably protect streams and other aquatic resources." Site Planning for Urban Stream Protection (Center, Dec. 1995) at 1, attached hereto as Exhibit A. **Development planning is generally recognized as one of the most critical aspects of any stormwater management program, and specific performance standards are essential to the effectiveness of these programs.**

R0069610

[1] All exhibits will be submitted separately from the original, facsimile version of this letter.

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Staff's Recommendation

Given the importance of this program, NRDC strongly agrees with Staff's recommendation to include a numerical standard in the SUSMPs to guide BMP-design and ensure adequate mitigation of stormwater pollution in development planning. NRDC also supports the specific numerical standard recommended by Staff – the 85th percentile 24-hour runoff event, based on the maximized capture storm water volume for the area, or, in the alternative, a 0.75-inch storm size standard. This is the minimum acceptable standard for development planning in the Los Angeles area,[2] and it provides a good starting point for the implementation of this aspect of the Los Angeles County Municipal Stormwater Permit (NPDES No. CAS0061654) (the "Permit").

Basis for 0.75-Inch Standard

As you know, NRDC and the Santa Monica BayKeeper successfully sued the County of Los Angeles ("County") in 1994 over its failure to comply with the then-applicable Los Angeles Municipal Stormwater Permit. In settlement of that lawsuit, the County agreed to develop a comprehensive stormwater management program. That program is now outlined in the County's Storm Water Program Implementation Manual ("County Manual"), and the SUSMPs established therein impose a 0.75-inch standard. County Manual, Volume VII, Appendix C, attached hereto as Exhibit B.

The 0.75-inch standard was not chosen at random, but was the product of extensive discussion and negotiation, and the counsel of Dr. Richard Horner, a professor at the University of Washington, and one of the foremost experts in the field of stormwater management. See Exhibit C. Dr. Horner concluded that a higher standard would be preferable, but that the 0.75-inch standard would be a minimally-acceptable standard for the Los Angeles area. Consequently, this or a more stringent standard should be adopted for all other permittees under the Permit.

Similarly, the 85th percentile 24-hour runoff event, based on the maximized capture storm water volume for the area, is also based on sound science and the recommendation of stormwater management experts. Dr. Robert Brashear, Ph.D., P.E., of Camp Dresser & McKee suggested this as one of the three legitimate methods for calculating a development planning stormwater mitigation standard when he spoke at the August 10, 1999 workshop on this subject. It is therefore an appropriate alternative to the 0.75-inch standard.

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[2] NRDC believes that the threshold should actually be higher. We believe that new development projects should be designed to mitigate all the runoff generated by storms of up to either 1.0-inch or the size of a one-year, 24-hour storm, whichever is greater. Many areas around the country use a 1.0-inch standard, and many others use the six-month or one-year, 24-hour storm standard, such as the Puget Sound basin; Orlando and Winter Park, FL; and the States of New Jersey and Delaware. Another possible standard is to require that stormwater treatment facilities be designed with sufficient capacity to ensure that they capture 90% of the stormwater generated. Given the hydrology of the Los Angeles area, any of these standards would translate to at least a 1.0-inch storm.

These numbers are not only supported by experts in the field. They have been derived using well-recognized technical sources and uncontroversial assumptions. Exhibit D, from the California Storm Water BMP Handbooks, relates to the third method of calculating a numeric standard mentioned above in footnote 2 (based on a percentage of storm water volume captured). It demonstrates an analysis based on the STORM model, giving basin volume (not rainfall volume) in relation to a directly connected impervious area ("DCIA"). By using the 100% DCIA curve, one can approximate rainfall volume (i.e., all or almost all runs off and must be stored). The horizontal axis is in acre-ft/acre. Multiplying the numbers there by 12 gives inches. You can see that a 90% capture goal on the 100% DCIA curve requires about 0.09 acre-ft/acre, which, when multiplied by 12, results in 1.08 inches of storage.

The County's adoption of the 0.75-inch standard translates into an 80% capture rate. Looking again at the attached chart from the STORM model, an 80% capture rate translates to about .064 acre-ft/acre, which comes out to about 0.75 inches of storage. Similarly, an 85% capture rate would be about 0.95 inches. Various municipalities across the country, such as those in the Puget Sound basin; Clark County, WA; Orlando and Winter Park, FL; and the Northeast Illinois Planning Commission, employ between an 80% and a 90% (or greater) capture rate, when using capture rate as the basis for determining minimum retention capacity.

The County Adopted the 0.75-Inch Standard but has Inexplicably Removed it from the Proposed SUSMPs

Although the County adopted the 0.75-inch storm size standard in its own standard urban storm water mitigation plans, in its role as Principal Permittee under the Permit, it *removed* that numerical standard from the SUSMPs that it submitted to the Executive Officer, which are currently under consideration. As Tom Kennedy, representing the Los Angeles Countywide Permit Subcommittee, admitted at the workshop on August 10, 1999, the lowering and eventual removal of that performance standard was based on a political compromise, rather than on any scientific or environmental considerations. Thus, just as Heal the Bay expressed concern over the lack of a numerical standard, NRDC objects to the County's removal of the 0.75-inch standard and supports Staff's recommendation to re-insert it.

The 0.75-Inch Standard is Supported by Other Stormwater Management Programs

The use of a 0.75-inch (or larger) storm size as a minimum standard for the stormwater mitigation requirement in a development planning program is well supported by the experiences and policies of other municipalities around the Country. For example, Montgomery County, Maryland requires the implementation of structural BMPs sufficient to manage a 1.0-inch rainfall event according to infiltration standards/specifications; or to provide for a permanent pool equal to or greater than ½-inch of runoff from the drainage area; or to provide 24 hour detention and release of the total volume of runoff resulting from a 1 year storm or a 1 inch rainfall.

Montgomery County Regulation No. 5-90, § 4.B.3, attached hereto as Exhibit E. The city of Alexandria, Virginia has a "zero additional pollutant loading" standard. City of Alexandria Municipal Code § 13-117(A), attached hereto as Exhibit E. Right here in Los Angeles County, the city of Santa Monica's stormwater ordinance requires that parking lots be designed to be able to contain one inch of precipitation in a twenty-four hour period. Santa Monica City Municipal Code § 7.10.060(b)(3), attached hereto as Exhibit E. Accordingly, Staff's recommendation that the Executive Officer include the 0.75-inch numerical standard, or the 85th percentile 24-hour runoff event, into the SUSMPs represents a modest but appropriate initial performance standard for the implementation of a development planning stormwater pollution mitigation program in Los Angeles County.

In sum, the 0.75 inch standard is supported by sound science, the experience of other municipalities, and the precedent set by Los Angeles County itself, the principal permittee under the Permit. Given the existing precedents, the feasibility of its implementation, and the scientific bases for this standard, it is the lowest threshold that could possibly satisfy the Clean Water Act requirement to "reduce pollutants in discharges to the maximum extent practicable." 33 U.S.C. § 1342(p)(3)(B)(iii). Thus, there is every reason why the Executive Officer should adopt Staff's recommendation and insert that standard into the SUSMPs.

Scope of Application

As NRDC has repeatedly commented, the development planning program in general, and the numerical stormwater volume retention/mitigation standard, specifically, should apply much more broadly than simply to discretionary projects or the six types of development represented in the SUSMPs.[3] Once again, the County's program is both instructive and precedent-setting on the issue of scope of application. The County's program includes a list of over 20 types of projects and activities to which its stormwater review process, and its numerical mitigation standard, apply. See County Manual, Volume VII, pages 3-1 to 3-3, attached hereto as Exhibit F. Any standard adopted as part of the model SUSMPs should apply to a similar range of projects and activities.

Receiving Water Limits and Anti-Degradation Requirements

Of course, as a performance standard, Staff's recommendation is separate from the water quality-based standards that continue to apply separately and to establish – albeit indirectly – the independent requirement that whatever technology is implemented must be sufficient to ensure that stormwater and urban runoff do not introduce pollutants into the receiving waters at levels that "will cause, have the reasonable potential to cause, or contribute to an excursion above any .

[3] See, e.g., NRDC's January 8, 1999 letter re "Los Angeles County Proposed Model Development Planning Program," and NRDC's June 18, 1999 letter re "Tentative City of Long Beach Municipal Storm Water Permit."

. . water quality standard." 40 C.F.R. § 122.44(d)(1)(i). If the performance standard recommended by Staff fails to ensure the protection of beneficial uses and other aspects of receiving water quality standards, additional, or more aggressive, mitigation measures may be required.

Similarly, anti-degradation requirements prohibit the reduction of water quality from current levels. 40 C.F.R. § 131.12(a)(2). Thus, this requirement serves as an independent check to ensure that whatever performance standard is adopted protects the receiving waters from any degradation of water quality. Thus, if the current performance standard results in a lowering of water quality, it may have to be strengthened based on these regulations as well.

Requested Changes to Specific Language/Proposal

NRDC notes that Staff's recommendation is for the Executive Officer to "[i]ncorporate in, 'SUSMP Section 3. Minimize Storm Water Pollutants of Concern,' numerical mitigation measures for BMP design criteria . . ." Regional Board "Notice of Public Hearing" (August 16, 1999) ("Notice") at 2. In the interests of clarity and simplicity, we would recommend that the Executive Officer simply *replace* the non-numerical standard currently listed in the SUSMPs with the numerical standard recommended by Staff, rather than maintaining the current structure and trying to "incorporate" the numerical standard into it. Mere incorporation of the numerical standard into the existing structure would result in two separate standards and likely confusion. Included as Attachment 1 to this letter is a redlined version of "SUSMP Section 3. Minimize Storm Water Pollutants of Concern," from the 100+ Home Subdivision SUSMP, providing an explanation of how this language could be inserted.

In addition, as Staff noted in its recommendation, the SUSMPs for automotive repair facilities, retail gasoline outlets, restaurants, and hillside located single-family dwellings do not require treatment control BMPs. They also do not include a section entitled "Minimize Storm Water Pollutants of Concern," as the other three SUSMPs do. Because Staff recommended that this discrepancy be rectified, and because of the language of Staff's recommendation regarding numerical standards (to include "numerical mitigation measures for BMP design criteria"), we interpret that recommendation to apply to all seven SUSMPs. This will necessitate the addition of a section, analogous to the one reproduced in Attachment 1, into the four SUSMPs currently lacking such a section.

Thank you for the opportunity to comment on the County's proposed SUSMPs and on the Staff's recommended action with respect to them. If you have any questions regarding any of the above, feel free to contact Alex Helperin at (323) 934-6900.

Sincerely,

David S. Beckman
Alex N. Helperin

Enclosures

X E

NRDC Natural Resources Defense Council

June 10, 1999

Mr. Tim Piasky
County of Los Angeles
Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803-1331

Re: Proposed Standard Urban Stormwater Mitigation Plans

Dear Tim:

As you are well aware, the Natural Resources Defense Council ("NRDC") and the Los Angeles County ("County") Department of Public Works ("DPW") recently came to an agreement on the form and content of the DPW's Urban Stormwater Mitigation Plans ("USMPs"), thus resolving one of the final remaining issues in the implementation of the settlement agreement that came out of our 1994 lawsuit (NRDC v. County of Los Angeles, N.D. Cal., Case No. 94-5978). Pursuant to that agreement, the DPW's USMPs require that development projects "be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system." The Standard USMPs currently proposed by the County DPW under the Los Angeles Municipal Stormwater Permit (NPDES No. CAS614001) (the "Permit") would only require that development projects mitigate site runoff generated from storms of up to "0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system."

As you also are well aware, the 0.75-inch threshold was the lowest cut-off point NRDC was willing to accept. The objective of the Permit, and the requirement of the federal Clean Water Act section on municipal stormwater discharges, is to impose controls "to reduce pollutants in discharges to the maximum extent practicable." Permit at 12; 33 U.S.C. § 1342(p)(3)(B)(iii). At a minimum, then, the programs developed under the Permit must ensure that stormwater pollution levels decrease, rather than increase. However, without an effective development planning program, continued development throughout the Los Angeles area and its ever-growing suburbs *will* lead to increases in pollutant loadings. Capturing 80% of the stormwater runoff is simply not enough.

I also find the addition of the phrase "impervious directly connected areas" to be confusing. The mitigation requirement should apply to *all* site runoff generated by storms of the selected size or smaller. This phrase creates ambiguity as to whether all site runoff is governed by the mitigation

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requirement or whether development plans can ignore runoff that might be coming from pervious or non-directly connected areas.

Finally, the fact that the County has been willing to adopt the standard that it adopted for its own development planning program USMPs is a good first step. It is important that the County serve as a model for the co-permittees under the Permit. However, it sends entirely the wrong message for the County, as the Principal Permittee, to adopt a less stringent model program than its own program, essentially telling the co-permittees that they need not develop as stringent a program as the County has decided to adopt. If the County can use the 0.75-inch standard, there is no reason why the co-permittees should not be required to do the same.

Please do not hesitate to contact me if you have any questions regarding the above.

Sincerely,

Alex N. Helperin

cc: Dennis Dickerson, Executive Director, Los Angeles Regional Water Quality Control Board
Don Wolfe, Assistant Director, Los Angeles County Department of Public Works

Santa Monica Baykeeper
P. O. Box 10096
Marina del Rey, California 90295
310 305-9645

January 11, 2000

Dennis Dickerson, Executive Director
and Members of the Board
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles CA 90013

Re: Support for Runoff Controls on
New and Redevelopment Projects

Dear Mr. Dickerson and Members of the Board:

On January 26, 2000, I urge you to adopt a reasonable standard to address polluted runoff from development projects in the Los Angeles metropolitan area. In a region that is constantly being built and rebuilt, these types of controls are necessary to reduce the amount of polluted runoff that invades our streams, rivers and coastal waters.

At a minimum, please ensure that specified new and redevelopments capture, treat or infiltrate the runoff generated by a 0.75 inch storm. Many other areas of the country have already adopted similar or more stringent standards. By adopting this proposal, you and the Regional Board can take a significant step in water quality protection.

Sincerely,

Gilbert N. Segel
President

R0069618



SANTA MONICA
BAYKEEPER
Protecting Our Bay
in cooperation with
The Frank G. Wells
Environmental Law Clinic &
the Water Keeper Alliance

September 9, 1999

Mr. Dennis Dickerson
Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

Santa Monica BayKeeper hereby submits this letter in connection with your review of the proposed NPDES permit, dated August 16, 1999, for the Los Angeles Refining Company (NPDES Permit No. CA0003778) ("LARC").

As with the previously proposed permit, which was withdrawn, the BayKeeper takes issue with a number of elements in the current version of LARC's proposed permit.[1] Most notably, the BayKeeper continues to believe that the proposed permit violates the federal antidegradation requirements on numerous fronts. BayKeeper also questions the validity of the refinery's reporting procedures and believes severe financial penalties, at a minimum, are warranted for years of permit non-compliance by the refinery.

I. THE PROPOSED PERMIT VIOLATES THE ANTIDEGRADATION POLICY

The federal antidegradation policy (which is incorporated by the State of California in State Water Board Resolution No. 68-16) requires that "[e]xisting instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." 40 CFR § 131.12(a)(1). Moreover, this policy justifies a lowering of water quality only when water quality is found to exceed levels necessary to support existing beneficial uses *and* such lowering is necessary to accommodate important economic or social development. 40 CFR § 131.12(a)(2).

[1] Santa Monica BayKeeper submits these comments as a supplement to its earlier comments, dated June 24, 1999 which were directed towards the withdrawn draft LARC permit. Those comments are incorporated by reference and should be noted to the extent that issues raised in the withdrawn proposed permit have not been adequately addressed in the current version of the proposed permit.

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The antidegradation policy is triggered when water quality for a pollutant drops below the highest level of water quality achieved for that pollutant since 1975. See Administrative Procedure Update, State Water Resources Control Board (Effective July 2, 1990) p. 4.

Moreover, in the situation at hand, the impairment of the Dominguez Channel is acknowledged, and LARC's discharge has been classified as a major discharge to the Dominguez Channel by the U.S. EPA and the Regional Board. See Proposed Permit, Paragraph 14 and 18, Page 5. Thus, any increase in pollutant mass loading over levels in the 1984 permit will result in a further lowering of water quality and violate the antidegradation policy.

A. The Proposed Permit Allows for Higher Levels of Contaminated Stormwater Runoff to be Discharged than Under the Existing Permit, Thereby Violating the Antidegradation Policy.

Under the existing permit, maximum daily stormwater discharge "up to 2.88 million gallons per day" is allowed. See Existing Permit, Paragraph No. 4. With this in mind, the existing permit states that "[t]he discharge of wastewater effluent . . . in excess of the following . . . limits is prohibited:" *Id.* at Paragraph A. 2. — Effluent Limitations. The existing permit then set the following mass loading limits for contaminated stormwater runoff:

	Maximum Daily Discharge	30-Day Average Discharge
BOD5	1,152 lbs/day	605 lbs/day
suspended solids	691 lbs/day	403 lbs/day
oil and grease	363 lbs/day	193 lbs/day

See Existing Permit, Paragraph A. 2. — Effluent Limitations.

The current proposed permit, however, does not put *any* limit on the volume of contaminated stormwater runoff that is allowed to be discharged. This is in fact a change from the withdrawn version of the proposed permit where the maximum stormwater volume was set at 6.6 mgd.[2] See Withdrawn Proposed Permit, Paragraph 1, Page 3. In the current proposed permit, however, the only limit placed is on the concentration of the runoff which is specified in pounds of pollutant per 1,000 gallons of stormwater runoff per day. See Proposed Permit, P. 14.

[2] As expressed in our June 24, 1999 letter, even this proposal of 6.6 mgd was a violation of the antidegradation requirements. However, the latest staff proposal appears to be even worse, notwithstanding those prior comments.

Rather than admitting that the proposed permit allows for a higher mass loading of pollutants, the claim is made in the current proposed permit that the *existing* permit never set a cap on the volume of runoff which is allowed. See Proposed Permit, Paragraph 8, Page 3. As discussed, *supra*, this claim is in direct contravention of the plain reading of the existing permit. In fact, any other reading of the existing permit would render the mass loading levels for the above three referenced parameters as non-binding and irrelevant, which we believe could not have been the intent of the Board in adopting the 1984 permit requirements.

The impact of this change in the proposed permit is that, given the concentration limits for the above three pollutants in the current proposed permit, higher levels of these pollutants will be discharged when the level of stormwater discharge is allowed to exceed 2.88 mgd. The following table illustrates the differences between the stormwater runoff limits under the existing permit versus the proposed permit (assuming a stormwater release of 6.6 mgd):

Constituent	Proposed Permit (6.6 mgd)	Existing Permit (2.88 mgd)
Biological Oxygen Demand	1,386 lbs/day (mo. avg) 2,640 lbs/day (max.)	605 lbs/day (mo. avg.) 1,152 lbs/day (max.)
Suspended Solids	924 lbs/day (mo. avg) 1,584 lbs/day (max.)	403 lbs/day (mo. avg.) 691 lbs/day (max.)
Oil and Grease	442.2 lbs/day (mo. avg) 858 lbs/day (max).	193 lbs/day (mo. avg.) 363 lbs/day (max.)

As is evident, at the expected maximum stormwater runoff volume of 6.6 mgd, the pollutant mass loadings for these pollutants into the Dominguez Channel are more than doubled. Consequently, by allowing an increase in the mass loading of the above three referenced pollutants, the current proposed permit violates the antidegradation policy. More -- rather than less -- contaminated stormwater will be permitted to be released as a result of the permit as it is currently proposed.

The current lack of any mass loading limits for contaminated stormwater runoff also violates California Water Code Section 13223 which prohibits delegation of the modification or issuance of waste discharge requirements to the Executive Officer. In this instance, not only is overall responsibility for setting these limits delegated to the Executive Officer, but much of the calculations are left to the discharger.

This change in the current permit also begs the question of whether LARC is being pressed to move forward towards a higher standard of pollution prevention. To lower the level of stormwater contamination leaving the site, LARC needs to improve upon its Storm Water Pollution Prevention Plan. In this context, it is relevant to note that a LARWQCB Staff

Inspection Report of the LARC site stated that "[t]here is a Storm Water Pollution Prevention Plan which covers only a 5 acre slough area of the total property of 305 acres." Complaint Inspection Report, 1/20/95, Inspected by Theresa Hemming. To our knowledge, this situation has not been remedied.[3] Moreover, a subsequent inspection reported stated that "Texaco staff could not clearly explain their strategy for managing stormwater: for instance, at what point stormflow would have to be diverted to holding ponds; and at what point untreated storm flows would have to be released in Dominguez Channel." Inspection Report, October 1, 1997, Inspected by Gary Schultz et al. Thus, there is clearly much more that LARC could do to lower the pollutant mass loadings of it stormwater runoff. Simply allowing an increased discharge of stormwater mass loadings violates the letter and spirit of the Clean Water Act.

In addition, LARWQCB staff are constantly claiming that stormwater requirements require implementation of Best Management Practices (BMP) to reduce pollutants to the Maximum Extent Practical. However, it has never been explained exactly what BMPs are being applied in this instance. Moreover, there has also been no explanation as to the basis for the claim that LARC's current stormwater management practices are reducing pollutants to the Maximum Extent Practical as required by law.

In the end, it is simply unacceptable to allow the level of pollutants discharged to remain constant for every gallon of stormwater that leaves the LARC site. What this means in plain terms is that the LARC site is so dirty that no amount of stormwater can rinse the property of its pollutants. In the end, LARC, rather than stormwater, should be made to clean up this property. LARC should be held, at least, to the stormwater mass loading limits in the existing permit.

B. LARC'S Dry Weather Limits for Conventional Pollutants in the Current Proposed Permit Also Violate the Antidegradation Policy.

While the current proposed permit on its face seems to lower, from the existing permit, the level of allowed discharge in dry weather for conventional pollutants, these levels do not protect the highest level of water quality achieved for these pollutants in the Dominguez Channel since 1975. Thus, these limits run afoul of the antidegradation policy.

The following table demonstrates that actual reported mass loading and concentration limits for conventional pollutants are well below the limits proposed in LARC's new permit for these same pollutants. Consequently, if LARC were allowed to discharge at the limits allowed in the proposed permit, its discharge would lower water quality for these pollutants below the cleaner levels previously achieved. It is therefore necessary to lower the level of allowable

[3] BayKeeper is unable to tell whether this situation has changed, since nothing in the file provided under our Public Records Act request addressed this issue further. There was no SWPPP in the files that BayKeeper was provided.

discharge in order to ensure that the cleaner level of water quality that LARC has already achieved is maintained.

The following table shows the annual average of dry weather effluent discharge achieved for each conventional pollutant from 1994 to 1998.

LARC's Annual Averages of Effluent Discharge from 1994 to 1998

	1998 average	1997 average	1996 average	1995 average	1994 average	Lowest Annual Average for 1994 to 1998	Limits in Current Proposed Permit (monthly avg.)
Settleable Solids	.2 ml/l	<.1 ml/l	<.1 ml/l	.1 ml/l	.071 ml/l	.071 ml/l	1 ml/l
COD	96 mg/l 1,859 lb/dy	97 mg/l 1,582 lb/dy	108.3 mg/l 1,830.5 lb/dy	100.15 mg/l 1,569.4 lb/dy	171.65 mg/l 2,164.6 lb/dy	96 mg/l 1,569.4 lb/dy	--------- 3,140 lb/dy
Oil and Grease	7 mg/l 145 lb/dy	8 mg/l 139 lb/dy	6.8 mg/l 122.2 lb/dy	7.1 mg/l 104.1 lb/dy	8.4 mg/l 111.5 lb/dy	6.8 mg/l 104.1 lb/dy	10 mg/l 211 lb/dy
Suspended Solids	20 mg/l 422 lb/dy	3 mg/l 50 lb/dy	7 mg/l 122.4 lb/dy	6.25 mg/l 92.7 lb/dy	16.3 mg/l 218.9 lb/dy	3 mg/l 50 lb/dy	30 mg/l 580 lb/dy
Phenol	.10 mg/l 2.13 lb/dy	.09 mg/l 1.56 lb/dy	.12 mg/l 2.12 lb/dy	.18 mg/l 2.6 lb/dy	.18 mg/l 2.3 lb/dy	.09 mg/l 1.56 lb/dy	.2 mg/l 4.8 lb/dy
Ammonia as N	11 mg/l 214 lb/dy	8 mg/l 145 lb/dy	6.23 mg/l. 109.4 lb/dy	6.72 mg/l 110.9 lb/dy	5.4 mg/l 64.8 lb/dy	5.4 mg/l 64.8 lb/dy	21 mg/l 395 lb/dy

Hydrogen Sulfide	<.1 mg/l 2.1 lb/dy	.23 mg/l 3.07 lb/dy	<.1 mg/l .76 lb/dy	no data	no data	<.1 mg/l .76 lb/dy	.2 mg/l 3.8 lb/dy
Total Chromium	.08 mg/l 1.82 lb/dy	.01 mg/l .18 lb/dy	.013 mg/l .23 lb/dy	.027 mg/l .44 lb/dy	.04 mg/l .45 lb/dy	.01 mg/l .18 lb/dy	.05 mg/l 6.2 lb/dy
Hexavalent Chromium	<.01 mg/l <.21 lb/dy	<.01 mg/l <.17 lb/dy	<.01 mg/l .18 lb/dy	.01 mg/l .17 lb/dy	.01 mg/l .13 lb/dy	<.01 mg/l .13 lb/dy	.039 mg/l .5 lb/dy
Residual Chlorine	.06 mg/l	.05 mg/l	.02 mg/l	.023 mg/l	.065 mg/l	.02 mg/l	.1 mg/l
BOD5	17.6 mg/l 345.8 lb/dy	18.8 mg/l 300.1 lb/dy	16.24 mg/l 266.7 lb/dy	12.1 mg/l 208 lb/dy	13.9 mg/l 180.1 lb/dy	12.1 mg/l 180.1 lb/dy	30 mg/l 725 lb/dy

In SWRCB Order No. WQ 90-5, the State Board directed the San Francisco Regional Board on the appropriate method for establishing mass-based limits which comply with the State and federal antidegradation policies. In that 1990 Order, considering a petition relating to several South San Francisco Bay sewage plants, the State Board found that "in order to comply with federal antidegradation policy, the mass loading limits should be revised, based on *mean loading*, concurrently with adoption of revised effluent limits." Order No. WQ 90-5 at 78 (emphasis added). The reason the State Board ordered the mass limit equation revised was to hold the South Bay plants to their *actual* performance so as not to violate the antidegradation policy:

> The South Bay permits allow both an increase in the volume of the discharges, as well as an increase in the mass emissions of toxic pollutants over current levels. To illustrate, the actual 1989 mass emissions from the three [South San Francisco Bay treatment] plants was 47,600 pounds per year (lbs/yr). Allowable mass emissions under the revised mass emission limits total 67,968 lb/yr. Thus, the permits allow a lowering of surface water quality below the highest levels achieved since 1975, and the federal [antidegradation] test must be applied.

Likewise, State Board Resolution No. 68-16 is applicable.

Order No. WQ 90-5 at 73. Hence, the State Board's Order finds that any mass limit that fails to lock in the "highest levels achieved since 1975" must comply with the antidegradation policy. Unfortunately, the proposed LARC permit inevitably will allow increases in mass emissions for those pollutants listed in the table above.[4]

If the LARC permit does not include mass limits for pollutants based on the current "mean loading," the permit will be in violation of the antidegradation policy and the State Board's previous Order. In order to comply with the antidegradation policy, the monthly average effluent limits (as well as the daily maximum limits) in LARC's permit need to reflect the lowest average limits achieved from 1994 to 1998 as indicated in the table above.[5]

II. ADDITIONAL RECOMMENDATIONS FOR THE NEW PERMIT.

We would also like to make the following recommendations for the new permit.

1. The mass loading dry weather limit for total chromium is inappropriate given the concentration limit. With a monthly average allowed concentration of 50 ug/l, it is impossible for monthly average mass loading to reach 6.2 lbs/day even with a discharge of 4 million mgd. Rather, the appropriate calculation for mass loading yields 1.67 lbs/day. Similarly, the 18 lbs/day maximum figure is also inappropriate given the concentration limit. Moreover, there should also be a maximum concentration limit set in the permit for total chromium. In fact, the

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[4] The proposed permit also seems inevitably to allow for increases of mass loading of several pollutants not listed above. For example, the proposed permit allows Toluene -- a state and federally recognized toxic pollutant -- to be discharged at levels of over 6,670 pounds per day. In addition, Diethyl phthalat is permitted for a discharge of up to 4,000 pounds per day while Ethylbenzene's maximum discharge level is permitted at 967 pounds per day. Staff seems to believe that these levels are allowable under the assumption that 4 mgd (rather than the 2.88 mgd of dry weather discharge allowed under the existing permit) of effluent will be discharged from the refinery during dry weather. Staff, however, has provided no explanation whatsoever as to whether this complies with antidegradation requirements.

[5] Please note that BayKeeper did not select the lowest monthly average achieved for each pollutant from 1994 to 1998 as the necessary limits in the new permit. Rather, we have been conservative with the recommendation that LARC's monthly average limits in the new permit reflect the lowest annual average limits achieved since 1994. Moreover, it is obvious that LARC's maximum daily limits will also need to be lowered in order to ensure that the new monthly averages will be attained.

monthly reports already report for the daily maximum concentration level.

2. Methyl tertiarybutyl ether limits are way up in the proposed permit from the withdrawn proposed permit. These levels went from 13 ug/l to 8 mg/l and from 0.34 lbs/day to 267 lbs/day. See Page 12, Fn. 11 in the Proposed Permit. We request a response as to the justification for this decision. Moreover, we also would like to know what is the drinking water standard for MTBE. Recall that the Office of Administrative Law has rejected the Regional Board's attempt to dedesignate drinking water as a beneficial use of the Dominguez Channel. If this proposed limit is not consistent with the drinking water level, then we would like to know what standard is being applied and why. Moreover, we would like an explanation as to why a "goal," rather than an enforceable limit, is included in the proposed permit.

3. The current proposed permit still violates antibacksliding requirements because LARWQCB staff has not corrected the daily maximum stormwater level for oil and grease. At 0.13 lbs/1,000 gallons, this level of pollutant discharge would amount to 374.4 lbs/day (assuming 2.88 mgd of stormwater runoff) while the existing permit sets a level of 363 lbs/day under these conditions. We would appreciate that this value be appropriately lowered. See BayKeeper comments of June 24, 1999.

4. There should also be a dry weather concentration limit for COD and BOD5. These values are already reported in the monthly permits and can be easily incorporated. See antidegradation arguments above.

5. Narrative criteria should be monitored and reported daily. This would not place a substantial additional financial burden on LARC and it could help ensure that water quality goals are being met on a daily basis.

6. LARC should be required to report daily on the following pollutants: COD, Chlorine, oil and grease, and sulfides. In fact, LARC already does conduct daily testing of these pollutants. Given that it has had compliance issues with these pollutants, it should be required to report on these pollutants with a higher frequency.

III. THE CDO DOES NOT REQUIRE LARC TO CEASE DISCHARGE TO THE DOMINGUEZ CHANNEL.

LARWQCB staff seems to be under the impression that the Cease and Desist Order is a substantial step towards achieving water quality standards in the Dominguez Channel. This is

because LARC has promised, in writing, to cease discharge to the Dominguez Channel by September 30, 2001. The CDO, however, fails to actually hold LARC to this commitment. Instead, the CDO merely requires that the discharger "achieve compliance with Order 99-XXX, by September 30, 2001." As is discussed above, the problems with Order 99-XXX are great. Unless these problems are corrected, the Regional Board will be giving LARC several years simply to achieve limits which are unacceptable, and, in many instances, less than the refinery's current performance. Even if the limits are improved, LARC will still be discharging thousands of pounds of toxic pollutants per day into the Dominguez Channel. This is not a water quality victory at all.

The Regional Board should hold LARC to its promises. We suggest the following language in place of the above quotation: "... cease discharge to the Dominguez Channel by September 30, 2001."

IV. LARC IS NOT ACCURATELY REPORTING VIOLATIONS ON MONTHLY AND ANNUAL REPORTS.

In our review of all the data provided to us by the Board pertaining to LARC's self-monitoring, a number of inconsistencies have arisen which lead us to believe that LARC's reporting of discharges are not completely accurate.

As you are aware, federal law requires that the monitoring program specified in the NPDES permit must provide data that is "representative" of the pollutant amounts being discharged by the permittee. See 40 CFR § 122.48. In this context, a permittee is required to provide data as part of its monthly and annual reports, *and* any other data for parameters which are more frequently tested while using EPA approved test procedures. See 40 CFR § 122.41(l)(4)(ii). In addition, a permittee is also required to report "any noncompliance which may endanger health or the environment" within 24 hours of the permittee becoming aware of the exceedance. 40 CFR § 122.41(l)(6). Finally, the permittee is required to "report *all* instances of noncompliance . . . at the time monitoring reports are submitted." 40 CFR § 122.41(l)(7) (emphasis added). Thus, in requiring LARC to provide monitoring data, the intent of the law is that any and all exceedances of permit limits be reported and included in the monthly and/or annual reports.

We became aware of permit violations not being reported in the monthly or annual reports when we examined the Notice of Violation ("NOV") issued by the LARWQCB to LARC on March 30, 1998. Specifically, the NOV specified violations in 1997 that were not recorded in any monthly report in 1997 nor in the 1997 annual report. The following table outlines the discrepancies between the NOV and the 1997 Annual Report.

	March 30, 1998, NOV (issued for violations in 1997)	1997 Annual Report
COD	6 exceedances (daily max.)	4 exceedances (daily max.)
Oil &Grease	21 exceedances (daily max.)	3 exceedances (daily max.) 2 exceedances (30 day avg.)
Sulfides	8 exceedances (daily max.)	5 exceedances (daily max.) 2 exceedances (30 day avg.)

Especially significant is the stark contrast between the number of exceedances reported in the 1997 annual report for oil and grease (which corresponds to the reporting in the monthly reports) and the NOV. It is simply inexcusable, and a violation of the law, that such information was not included in the monthly and annual reports. Without this timely presentation of information, it is impossible for the Board, as well as the general public, to have a complete understanding of the status of permit compliance and potential public health and environmental hazards created by LARC's discharge.

Moreover, when LARWQCB staff provided us with the data on which the NOV is based, we also found similar stark discrepancies between the 1996 annual report and the 1996 data that we received. Specifically, the 1996 annual report identifies one exceedance for oil & grease in 1996, while the data we were provided by the Regional Board identifies 25 exceedances. Similarly, the 1996 annual report identifies 5 exceedances for COD, yet the data we were provided identifies 17 exceedances.[6]

The discrepancies between annual reports and monitoring data shown above display a pattern of inaccurate reporting in monthly and annual reports. Moreover, the fact that data going as far back as 1996 was not provided to the LARWQCB until 1998 further demonstrates LARC's

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[6] In conversations with LARWQCB, we were told that there may have been additional data presented to staff which was not included in the monitoring data. However, when asked why this additional information was not provided as part of our public records request, staff responded that this document must have been misplaced. Ultimately, we were provided with a document that LARC sent to the LARWQCB on March 20, 1998, which contained data on violations in 1996 and 1997. LARC states in this document that this monitoring data was being provided in response to LARWQCB staff's request. However, as discussed earlier, federal law requires that any and all exceedances be recorded in the monthly and/or annual report. See discussion of applicable law on page 7, *supra*. Thus, LARC's omission of this data from 1996 and 1997 monthly and annual reports constitutes a significant violation of law.

intent not to make this data available as required by law. See discussion *supra*.

It is also relevant to note that at times the NOV specifies exceedances on dates when the monthly report indicates that a weekly sample was taken but no violation was recorded. Thus, for example, the NOV identifies an exceedance of the Oil and Grease parameter on July 3, 1997, with values of 17 mg/l and 393 lbs/day.[7] However, the weekly sample taken July 3, 1997 as reported in the July monthly report states that the values for oil and grease that day were 13 mg/l and 301 lbs/day, which reflects no violation.

We also found additional inconsistencies. For example, on June 25, 1997, David Senn, a LARC employee, stated in handwritten notes on file with the LARWQCB that flow from outfall no. 2 appeared turbid and foamy. This is a violation of narrative criteria. See Existing Permit, Paragraph 9. However, the narrative criteria which was reported for that same date in the monthly monitoring report did not report any turbidity violations.[8] It is also relevant to note here that while none of the monthly or annual reports analyzed reported any violation of any narrative criteria, an inspection conducted by Theresa Hemming on January 19, 1995 found that the effluent sampled at LARC's main outfall had "black materials suspended in it." Complaint Inspection Report, January 19, 1995, Inspected by Theresa Hemming et al. In addition, inspectors who were standing above this outfall "became affected by the gassy vapors and complained of sore throats while coughing vigorously." *Id.* Theresa Hemming, who was directly at the outlet, experienced irritated nasal and sinus passages. *Id.*

Given the critical role that monthly monitoring data plays in assuring compliance with the NPDES permit requirements as well as keeping the public informed as to any permit violations, BayKeeper believes that a criminal investigation may be warranted in this instance.[9]

V. LARC'S HISTORY OF NON-COMPLIANCE WARRANTS A STRONG PENALTY.

BayKeeper believes that given LARC's history of violations, the issues regarding accuracy of reporting and the details of inspections already discussed *supra*, a strong penalty is

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[7] The permit limit for Oil and Grease is 15 mg/l and 360 lbs/day.

[8] This discrepancy can in part be explained by the time differences when the monitoring took place that day. Thus, while the monitoring for the monthly report takes place at 8:00 a.m., David Senn noted the turbidity at 5:55 (not clear whether this was am or pm). Nevertheless, the turbid and foamy discharge should have been noted in the monthly monitoring report.

[9] Water Code Section 13387(e) provides for criminal penalties for any person who makes any false statement, representation, or certification in any monitoring data.

necessary to send the message to LARC that it cannot expect to profit from not instituting the appropriate changes in its operations that would ensure that it meets its permit requirements.

Water Code Section 13385 sets out the criteria to be considered in evaluating the appropriate scope of an administrative penalty. A penalty of up to $10,000 per day is authorized plus $10 per gallon times the number of gallons by which the volume discharged but not cleaned up exceeds 1,000 gallons. See Water Code Section 13385(c).

In addition, in determining the amount of any liability imposed the regional board is required to "take into account the nature, circumstances, extent, and gravity of the violation, and, with respect to the violator, the ability to pay, any prior history of violations, the degree of culpability, economic benefit or savings, if any, resulting from the violation, and other matters that justice may require." See Water Code Section 13385(e).

The following is a summary of LARC's exceedances in the last five years. This data was compiled from information provided in annual reports and the NOV.

	1994		1995		1996*		1997*		1998		1999**		total
	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	Max	Avg	
BOD	0	0	0	0	0	0	0	0	0	0	0	0	0
TSS	1	1	0	0	0	0	0	0	2	1	2	2	9
COD	3	0	1	0	17	0	6	0	12	0	2	0	41
O & G	1	0	0	0	25	1	21	2	2	1	0	0	53
Phenols	7 (total)		8	4	4	2	0	0	1	0	0	0	26
Ammonia as N	0	0	0	0	0	0	0	0	0	0	0	0	0
Sulfides	0	0	0	0	0	0	8	2	0	0	0	0	10
Total Chromium	0	0	0	0	0	0	0	0	1	1	0	0	2
Hex. Chromium	0	0	0	0	0	0	0	0	0	0	0	0	0
Residual Chlorine	0	0	0	0	0	0	5	0	3	0	2	0	10
Settleable Solids	1	0	0	0	0	0	0	0	1	1	0	0	3
Temp.	0	0	0	0	0	0	0	0	0	0	0	0	0
pH	0	0	0	0	0	0	0	0	1	0	0	0	1
Sub-Total	14 (total)		9	4	46	3	17	4	23	4	6	2	155

* 1996 and 1997 data include the additional violations noted in the March 30, 1998, NOV.
** 1999 data was obtained up until June, 1999.

In addition to the 155 violations cited in the above table, a table put together by staff for

violations occurring between 1987 and 1994 shows that LARC incurred 49 violations of its permit conditions. This information, taken together, demonstrates a pattern of non-compliance that should be taker seriously. This is especially the case since the permit conditions are themselves quite outdated given the fact that this permit has not been renewed since 1984.

Moreover, while LARC has repeatedly made assurances that it would correct the operational glitches that cause violations, see LARC monthly reports and LARC letter to Dennis Dickerson dated April 30, 1998, the fact remains that its violations have increased in recent years. In February 1998, LARC exceeded the discharge limit for COD six times and also exceeded the pH limit in that same month. See February, 1998 monthly monitoring report. In this context, LARC's ability to profit from not having to improve its operations to ensure compliance may be assumed.

Finally, LARC could have dealt with its pollution of the Dominguez Channel by piping its LCOD discharge to the Joint Water Pollution Control Plant along with its HCOD wastestream. However, this would have cost LARC $400,000 per year in additional annual fees to the sanitary sewer. By not complying with the permit, LARC has earned an additional profit of $2 million in the last five years alone. This amount must be disgorged from the company. To impose a lesser penalty violates the Memorandum of Agreement (MOA) between the SWRCB and the EPA, which requires the RWQCBs to "assur[e] that no one realizes an economic advantage from non-compliance." MOA at 38. It also violates SWRCB enforcement guidance that "dischargers should not gain an economic advantage from non-compliance." This policy concludes that penalties should, "at a minimum take away whatever economic savings a firm or agency gains as a result of those violations."

Based on all the factors discussed *supra*, we highly recommend a penalty of at least two million dollars. Given that LARC is a multi-million dollar corporation, there is little doubt that only a heavy penalty will provide the necessary incentive for this corporation to take permit compliance more seriously.

Conclusion

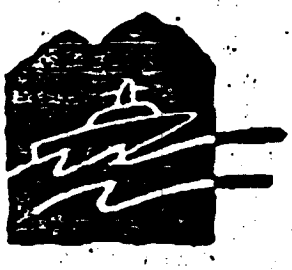
In sum, we ask the Board to assure that both dry weather and stormwater limits in the proposed permit comply with the antidegradation policy. Specifically, LARC should not be allowed to exceed stormwater runoff mass loadings as they appear in the 1984 permit, and LARC's dry weather discharge limits should reflect the lowest annual average discharge levels achieved in the last five years. In addition, we ask that the proposed permit clarify that dry weather limits for toxic pollutants also apply to stormwater runoff.

We also ask that the CDO make clear that LARC is prohibited from discharging into the Dominguez Channel after September 30, 2001. Moreover, we urge the Board to seriously

examine the inaccurate reporting on monthly and annual monitoring reports, and consider initiating a criminal investigation. Finally, for all of the reasons already discussed, civil penalties of at least $2 million must be imposed on this refinery.

Sincerely,

Philip Shakhtis, Esq.
Santa Monica BayKeeper



SANTA MONICA
BAYKEEPER
Protecting Our Bay
in cooperation with
The Frank G. Wells
Environmental Law Clinic &
the Water Keeper Alliance

September 9, 1999

Post It® Fax Note 7671	Date	# of pages ▶ 4
To Members of the Board	From Steve Fleischli	
Co./Dept.	Co	
Phone #	Phone # (310) 305-9645	
Fax # 213 576-1625	Fax #	

Members of the Board
Los Angeles RWQCB
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Members of the Board:

The following constitutes the Santa Monica BayKeeper's comments relative to the Board's consideration of the Standard Urban Storm Water Mitigation Plans under the Los Angeles County Municipal Storm water permit (hereinafter "SUSMPs") The BayKeeper believes the SUSMPs for new development provided by the County do not comply with federal requirements. Significant changes are needed to ensure new development does not cause or contribute to further degradation of local waters.

In summary, BayKeeper believes that the staff's proposal of a 0.75" standard for storm water treatment is more than reasonable, especially given that legal requirements dictate a far more restrictive standard for new development covered under a municipal storm water permit.

1. New Development May Not Degrade Local Waters

Federal Antidegradation requirements demand that discharges must maintain and protect existing water quality, unless certain economic considerations apply. See 40 CFR 131.12 (a)(2), see also, US EPA Region 9 Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12, at 1-2 (June 3, 1987). In addition, the regulations provide that "the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources...." Id. Storm water runoff (point or nonpoint) is not exempt from these requirements. See e.g. SWRCB Antidegradation Policy Implementation for NPDES Permitting, at 3 (May 1990). Federal guidance further clarifies that "[a]ctions covered by antidegradation provisions include, but are not limited to ... issuance of permits for urban runoff.[and] ... increases in the discharge of pollutants from point sources due to ... municipal growth [and] ... new sources." Region 9 Guidance at 2.

Because of these requirements, new development *must* be regulated in a manner which does not allow lowering of water quality, unless certain economic considerations are found.[1] Moreover, for

[1] One exception to the rule is where the lowering of water quality is necessary to accommodate important economic or social development. There is no information in the administrative record to suggest that this standard has been met. Indeed, BayKeeper believes it is impossible to meet this standard given the present state of California's economy and the extremely low unemployment rates in the region.

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Web Address: smbaykeeper.org / E-mail: info@smbaykeeper.org / Pollution Hotline: 1-800-HELPBAY

303(d) listed pollutants, the development action is subject to absolute prohibition. See Region 9 Antidegradation Guidance at 10.

Unfortunately, neither of these standards is met by the proposed SUSMPs. The proposed SUSMPs completely fail to address how water quality standards will be achieved. This is suggested without even the benefit of numeric mitigation measures, as Board staff has proposed. The proposed language in all of the SUSMPs includes only the following text, which fails to address these concerns:

> Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion

For the above reasons, the BayKeeper believes the Regional Board should amend the SUSMPs to reflect the requirements of federal law. It is nonsensical to limit new development runoff based solely on flow rather than water quality considerations. It is more absurd to do so only where erosion is a consideration – a problem which does not plague the myriad concrete lined rivers within Los Angeles County.

We suggest the deletion of the above County-proposed language and the addition of the following language in addition to the Regional Board staff's proposal.

> Regardless of volume, storm water runoff from new development shall not increase pollution loading above pre-development levels.

This should also be recognized without regard to the seven categories suggested in the proposed SUSMPS. This requirement should apply to ALL new development projects.

For impaired waterways, addressing this problem now will eliminate the need for future retrofits of these new developments once TMDLs are developed for pollutants impairing local waters. Such reactive measures could be far more costly than proactive handling of new development controls. For relatively clean waters, this may very well prevent them from becoming impaired (and thus requiring TMDLs) because of new development.

2. New Development May Not Add Any Additional Pollutants to Impaired Waterways

Because Santa Monica Bay, San Pedro Bay, and their tributaries have been found by the Regional Board, State Board, and EPA to be impaired with pollutants that are discharged from municipal storm water systems, including, among others, copper, zinc, lead, nickel, mercury, fecal contamination, and nutrients, the performance standards for new development cannot ignore the Clean Water Act's clear prohibition on the permitting of "new sources" of impairing contaminants into an already impaired waterbody. The federal regulations state that:

> No permit may be issued . . . (I) [t]o a new source or new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards.

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40 C.F.R. § 122.4(i). The one exception to that prohibition is applicable only after a pollutant load allocation for the particular problem pollutant is completed and there is an available allocation for the new source.[2] Id. "New sources" are defined as "any building, structure, facility, or installation from which there is or may be a 'discharge of pollutants' . . . ." 40 C.F.R. § 122.2. "New dischargers" include "any building, structure, facility, or installation: (a) from which there is or may be a 'discharge of pollutants' . . . ." Id. "Discharges of pollutants" include "surface runoff which is collected or channelled by man; discharges through pipes, sewers, or other conveyances owned by a State[,] municipality or other person which do not lead to a treatment works. . . ." Id. Thus, that prohibition precludes both new outfalls as well as any new source, such as a building or new development, which would discharge pollutants to an existing outfall (such as through a municipal storm drain system).

It is important to note that this requirement does not prohibit new development.[3] It does, however, dictate that any new development or new building projects must be designed in such a way so as not to contribute any impairing pollutants to our Bays or other impaired tributaries. Hence, any new developments or buildings must review the feasibility of including in their designs features that would eliminate any discharge of storm water from their footprint or otherwise eliminate the presence of copper, zinc, lead, nickel, mercury, fecal contamination, nutrients and other potentially impairing pollutants in storm water flowing off the site.

Unfortunately, the proposed SUSMPs for new development are entirely inconsistent with these binding federal requirements. Indeed, in the context of Los Angeles County's storm drain systems, which already contribute copper, zinc, lead, nickel, mercury, fecal contamination, nutrients and other pollutants that are impairing the Bay and local creeks, the performance standards for new development and analogous components of the County's municipal storm water permit should largely be driven by this baseline prohibition.

3. Water Quality Criteria Must be Developed for New Development

In addition to ensuring that water quality is not lowered because of contributions from new development, federal requirements require that numeric limits must be placed on those pollutant loads which are causing or contributing impairment of water quality. 40 CFR 122.44. As was stated above, there are numerous pollutants impairing beaches, rivers and lakes within Los Angeles County. Contributions of all of these should be regulated with numeric effluent limits.

Interestingly, even the present numeric mitigation proposal by Regional Board staff is performance based, rather than water quality based. The Municipalities which oppose these requirements fail to recognize that the Clean Water Act focuses not only on technology and performance based standards, but – most significantly – targets achievement of water quality standards through water quality based requirements. In this regard, the Regional Board would be fully justified in not only imposing staff's suggested numeric mitigation measures, but numeric effluent limits as well.

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[2] In Los Angeles County, it should be clear that this exception must fail because there are no completed TMDLs within the region.

4. BayKeeper Supports RWQCB Staff's Changes to the SUSMPs

BayKeeper supports staff's proposal to add consideration of "treatment control" BMPs to SUSMPS Section 3. Indeed, BayKeeper believes it will be nearly impossible to achieve the requirements of the Clean Water Act without this minimum level of BMP. BayKeeper also supports staff's proposed minimum numeric mitigation measures for new development. These numbers correlate with those numbers in place for the County of Los Angeles, which were the result of years of litigation – and significant compromise by the environmental community.

5. Other Issues

Despite the above deficiencies, BayKeeper is supportive of some of the other provisions of the SUSMPs. For example, it is appropriate for new restaurants to be required to design fixed locations (with grease traps) for equipment and accessory washing. It is also appropriate to require that these systems be connected to the sanitary sewer, rather than allowing them to drain to storm. Time and time again BayKeeper staff and volunteers have been contacted regarding illegal restaurant mat washing throughout the County. Public education only goes so far. A blanket requirement for new restaurants is by far the most efficient manner of handling this ubiquitous problem.

BayKeeper is also supportive of mandatory requirements for automotive repair shops and retail gasoline outlets. BayKeeper, however, questions how it will be determined that it is not "feasible" to construct cover for areas such as maintenance areas and material storage areas. Because of the high likelihood of contaminants from these areas, BayKeeper believes only a very limited exception should be given for lack of covering.

Sincerely,

Steve Fleischli
Executive Director

SIERRA CLUB
FOUNDED 1892

Angeles Chapter

December 8, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, # 200
Los Angeles CA 90013

RE: Support for Staff Recommendation for Standard Urban Stormwater Mitigation Plans

Dear Mr. Dickerson:

Sierra Club urges you to adopt the staff recommendation for the inclusion of numeric standards into the Standard Urban Stormwater Mitigation Plan. By requiring new development and redevelopment projects to capture and treat the runoff from a .75-inch rainfall, the RWQCB will start to improve the serious, chronic problems associated with urban runoff.

Without such standards in the past, not only have our coast and inland waters been polluted by runoff but also our rivers have been channelized and habitat degraded in attempts to deal with the excessive quantity of runoff.

Instituting this clear and necessary requirement will ensure future opportunities to improve water quality, to protect the coast and to revitalize our waterways throughout our region. By requiring these minimum standards in the design and construction of new development and redevelopment projects, RWQCB takes important action in a cost-effective way.

Sierra Club is confident that implementing the present staff recommendation will be looked upon tomorrow with pride and gratitude. I encourage you to act with such foresight. Thank you.

Sincerely,

Martin Schlageter
Conservation Coordinator
213-387-4287 x 204

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11-283

3435 Wilshire Boulevard, Suite 320 Los Angeles, CA 90010-1904 TEL: (213) 387-4287 FAX (213) 387-5383 www.angeles.sierraclub.org

Surfrider Foundation
South Bay Chapter

Conservation • Research • Education
Nonprofit Environmental Organization

January 19, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Dear Mr. Dickerson:

The South Bay Chapter of the Surfrider Foundation is deeply involved in protecting and improving the South Bay surf and beach experience. Our primary efforts include water quality monitoring, enhancing education and awareness, environmental activism, and ensuring continued access to our beaches and ocean.

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and re-developments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today, approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated to the ocean. With the nation's most infamous urban runoff problem, and few measurable requirements in the municipal storm water permits, we have countless beaches that are often unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy; Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any business owner near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Al Miller
Executive Committee, South Bay Surfrider

R0069638

11-328

P.O. Box 3825 • Manhattan Beach, California 90266
(310) 535-3116 • www.surfrider.org/southbay

11/18/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

R. J. Gordon, D.C.

South Bay Surfrider Chapter

R0069639

11/18/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,

South Bay Surfrider Chapter

11/18/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Lawrence Eason 11/15/99

South Bay Surfrider Chapter

R0069641

11/18/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

STEVE FISHER
South Bay Surfrider Chapter

11/18/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Mitchell Lambert

South Bay Surfrider Chapter

11/18/99

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Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Tom Marcellini

South Bay Surfrider Chapter

R0069646

11/18/99

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Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Cynthia Page
Surfrider Foundation

South Bay Surfrider Chapter

11/18/99

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Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Jason Ritacco

South Bay Surfrider Chapter

R0069649

11/18/99

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320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Thomas J. Sofree

South Bay Surfrider Chapter

R0069650

11/18/99

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R0069651

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Sincerely,

Edward A. Vincent

South Bay Surfrider Chapter

KENNETH J. ARAN*
CHRISTOPHER POLK
JEFF BERKE*

*A PROFESSIONAL CORPORATION

ARAN, POLK & BERKE
ATTORNEYS AT LAW
SUITE 550
11766 WILSHIRE BOULEVARD
LOS ANGELES, CALIFORNIA 90025
(310) 478-3888
TELECOPIER (310) 478-3020

NORTHERN CALIFORNIA OFFICE
50 CALIFORNIA STREET
SUITE 1500
SAN FRANCISCO, CA 94111
(415) 439-5242
TELECOPIER (415) 439-5299

December 14, 1999

Dennis Dickerson,
Executive Director
Los Angeles Regional Water Quality Control Board
320 West 4th Street
Suite 200
Los Angeles, California 90013

RECEIVED
1999 DEC 15 P 1:35
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Re: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,



Chris Polk

January 18, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

20 P 2:13

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I wanted you to know that after five years of research, the Los Angeles based environmental organization TreePeople has demonstrated the benefits and feasibility of capturing rainwater and recycling it. TreePeople brought together leading experts to develop best management practices, and then showed how easily they could be implemented.

Now, you have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

We've shown that it is feasible. Now it is up to you to ensure that it actually happens.

Thank you for your consideration.

Sincerely,

Conrad Bachmann

R0069655

11-319

Stephanie Balikos
29 Brooks Apt #2
Venice, CA 90291

January 19, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who

visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

It will probably be expensive but it will be worth it to me.

Sincerely,

Stephanie Balikos

R0069657

LAW OFFICES OF
BAIRD A. BROWN
A PROFESSIONAL CORPORATION
1000 WILSHIRE BOULEVARD
SUITE 620
LOS ANGELES, CALIFORNIA 90017-2463

TELEPHONE: (213) 688-7795

FAX: (213) 688-1080

December 9, 1999

RECEIVED
DEC 10 1999
BY:----------

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation

businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Very truly yours,

Baird A. Brown

BAB/amb
c: Lisa Boyle, Esq.

RECEIVED

2000 JAN 14 P 2:36

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
and Members of the Board
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Runoff Controls on New and Redevelopment

Dear Mr. Dickerson and Members of the Board:

I urge you to adopt on January 26, 2000, a reasonable standard to address polluted runoff from development projects in the Los Angeles metropolitan area. In a region that is constantly being built and rebuilt, these types of controls are necessary to reduce the amount of polluted runoff that invades our streams, rivers and coastal waters.

At a minimum, please ensure that specified new and redevelopments capture, treat, or infiltrate the runoff generated by a 0.75 inch storm. Many other areas of the country have already adopted similar or more stringent standards. By adopting this proposal, you and the Regional Board can take a significant step in water quality protection.

Sincerely,

Julie M. Barr

Date:

RECEIVED
2000 DEC 15 P 1:58
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Moira Beery

Name: Moira Beery
Address: Box 198
1600 Campus Rd.
LA, CA 90041

R0069661

RECEIVED

2000 JAN 14 P 2:37

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Amy Blount
481 Crane Blvd.
Los Angeles, CA 90065

January 12, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quar per-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming: creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Cordially,

A. Blount

R0069662

RECEIVED

1999 DEC 16 P 2:00

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Date:

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Corena Bowers

Name: Corena Bowers
Address: 7310 SW 8th Ave
Portland, OR 97223

R0069663

DEAR DENNIS DICKERSON,

I URGE YOU TO REQUIRE NEW DEVELOPMENT AND REDEVELOPMENT PROJECTS BE DESIGNED TO RETAIN RAINFALL. WATER COULD EITHER PERCOLATE INTO THE GROUND OR BE TREATED AND THEN DRAINED. ADOPTION OF THESE RECOMMENDATIONS WOULD BRING AREAS IN INCORPORATED CITIES UP TO THE SAME STANDARDS ALREADY IN PLACE IN UNINCORPORATED AREAS OF THE COUNTY. PLEASE SUPPORT THE PASSAGE OF THIS CHANGE ON JAN 26TH.

SINCERELY

NATHANIEL BOOTH



DONALD DUCK DUET
TIN WIND-UP TOY
(1947)

RECEIVED
JAN 10 2000
BY:.....

Disneyland Hotel
Anaheim, California

R0069664

From: <Lisakboyle@aol.com>
To: <ddickers@rb4.swrcb.ca.gov>
Date: 8/15/99 9:48PM
Subject: Numerical Mitigation Measure for Storm Water--Municipalities

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its ecological history: brought to this point by extensive development, an ill-conceived and overburdened flood control system and failure to rethink traditional approaches to storm water management, we stand at a point where 50% of our rainfall is converted into runoff that builds in toxicity as it crosses roads, parking lots, building sites, and industrial sites before it is channeled and runs into our ocean. Apart from its devastating affect on the marine life which supports us, this poison runoff has immediate and known human health impacts. Epidemiological research has shown that those who swim near storm drains are twice as likely to suffer gastrointestinal and respiratory problems, fever and sore throats, as those who kept at least 400 yards away.

In a region that is constantly being built and rebuilt, significant change in the way we deal with storm water at new developments and redevelopments will soon have a transformative impact on the amount of pollution that invades our oceans through untreated storm water. For the municipalities of Los Angeles County, we have the opportunity to set meaningful numerical standards to quantify the amount of storm water that must be treated of infiltrated at new and redevelopment sites before it becomes poison in the ocean.

At this critical point, as the regional Water Quality Control Board staff considers a numerical mitigation measure for development planning to present to the public and to the Board in September, Heal the Bay urges you to recommend, at the very minimum, the mitigation measure that is currently being applied in the unincorporated area of Los Angeles County--treatment or infiltration of at least a .75 inch storm.

Although we would have preferred a more protective standard for the County and for the municipalities, we are willing to support the compromise reached between NRDC and the County--the .75 inch storm retention standard, which translates into about an 80% capture rate. Many cities around the country use a 1 inch standard, and many others use a one-year, 24 hour storm standard (which is above 1 inch in Los Angeles) or an 80-90% capture rate. Considering the unique problems of Los Angeles, with so much impervious surface and such vulnerable rivers and coastal waters, we must be progressive as we attempt to solve our storm water problem.

On a local level, there is no sensible reason for the minimum numerical mitigation measure to differ for the incorporated and unincorporated portions of the County. If we are to succeed in the battle against storm water pollution, we must fight together, with every permittee properly fortified. In addition, a lower minimum standard for the incorporated portions of the County makes for an uneven playing field for development, and may simply shift the bulk of development to those areas with lower standards. This makes for unfair competition, and less protection for our waters.

As various permittees argue regarding the "cost-effectiveness" of mitigation measures such as the .75 inch storm standard, we urge you to remember that the cost of bringing our waters into compliance with the Clean Water Act can

only increase if we fail to mitigate storm water on-site.

History looks upon us at this critical juncture. Will we make a meaningful change to mitigate the effects of storm water? If we can, the results will be profound. In the City of Santa Monica alone, an evaluation of seven projects completed after the implementation of Santa Monica's Urban Runoff Mitigation Ordinance in 1993 (requiring new development to reduce projected runoff by 20%), indicated that nearly 1.1 million gallons of runoff were diverted from Santa Monica Bay during the 1994-1995 winter season, an average of 31,000 gallons per storm. If we are able to bring all the cities to at least the same level of mitigation that the County already has accepted for unincorporate areas we can look forward to dramatic reductions in the amount of storm water that spills into our ocean.

Thank you for your concern and attention to this matter of paramount significance to our water quality.

Sincerely,

LISA KAAS BOYLE, Esq.
Director of Law and Policy
HEAL THE BAY

CC: <xswamikannu@rb4.swrcb.ca.gov>

Date: December 13, 1999

2001 JAN -5 P 2:06

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Nola Butler Byrd

Name: NOLA BUTLER BYRD
Address: 2918 FRANKLE ST.
LAKEWOOD, CA 90712-3640

R0069667

CHATTEN-BROWN AND ASSOCIATES
10951 WEST PICO BOULEVARD
THIRD FLOOR
LOS ANGELES, CALIFORNIA 90064
TELEPHONE:(310) 474-7793
FACSIMILE: (310) 474-8504
E-mail: jchatten@earthlink.net

JAN CHATTEN-BROWN
DOUGLAS CARSTENS

KIMBERLY LEWAND
kimlewand@aol.com
Of Counsel

October 11, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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Sincerely,

Kimberly E. Lewand
Chatten-Brown and Associates

Date: 12/15/99

2000 JAN -6 P 2:01

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

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Sincerely,

Haan-Fawn Chau.

Name: Haan-Fawn Chau
Address: 10751 Rose Avenue, #211
L.A., CA 90034

Date: 12/9/99

RECEIVED
1999 DEC 17 P 1:53
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Susan Chun

Name: Susan Chun
Address: 2584 Wellesley Ave
Los Angeles, CA 90064

Date: 12/10/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Victor Chun

Name: VICTOR CHUN
Address: 2584 Wellesley Ave.
Los Angeles, CA 90064

R0069672

Date: 12/14/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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Sincerely,

Name: Jeff Conn
Address: 1478 Paseo de Oro
Pacific Palisades, CA 90272

RECEIVED
1999 DEC 17 P 1:48
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

R0069673



FAX TRANSMISSION

TOTAL NUMBER OF PAGES INCLUDING COVER SHEET: 2

DATE: September 14, 1999

TO: Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board

FAX: (213) 576-6660

FROM: BILL EHRLICH
9630 Oak Pass Road
Beverly Hills, CA 90210-1232
Tel: (310) 276-5952
Fax: (310) 275-5646
e-mail: ehrlichb@aol.com

RE: September 16, 1999 Hearing - SUSWP

Please submit the enclosed letter to the Board for review and action according to its contents.

Thanks to you and the Board for considering this request. It is of the utmost importance.

R0069674

BILL EHRLICH
9630 Oak Pass Road
Beverly Hills, CA 90210-1232
(310) 276-6962 FAX (310) 275-5646
e-mail: ehrlichb@aol.com

January 24, 2000

Post-it™ brand fax transmittal memo 7671	# of pages ▸ 3
To D. DICKERSON	From B. EHRLICH
Co.	Co.
Dept.	Phone #
Fax # 213-576-6625	Fax #

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Re: Standard Urban Storm Water Mitigation Plan

Dear Mr Dickerson:

On January 26, 2000, the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California homebuilder I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

The continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Please understand that I fully support the goal of cleaning our stormwater run off, that is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Very truly yours,

Bill Ehrlich

Enclosure as noted

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069675

11-352

KENNETH A. EHRLICH
TENTH FLOOR
2121 AVENUE OF THE STARS
LOS ANGELES, CALIFORNIA 90067

(310) 785-5395

January 11, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter - Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, I urge you to adopt a Standard Urban Stormwater Mitigation Plan for the Cities in Los Angeles County that requires mitigation, by specified new and redevelopments, through treatment or infiltration, of 100% of the runoff generated by the first three-quarters of an inch (3/4") of rain, with no exceptions. By adopting this standard, the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that becomes more toxic as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and few measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The Los Angeles Times supported the three-quarters inch standard in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three-quarter inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff hurts our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars ($2,000,000,000) annually, but these businesses largely depend on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business. With billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

KENNETH A. EHRLICH

bcc: Mark Gold, Heal the Bay

Date: December 14, 1999

RECEIVED

2000 JAN -5 P 2:02

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,

Eileen Espejo

Name: Eileen Espejo
Address:
1201 Ximeno Ave. # 201
Long Beach, CA 90804-4345

Fields & Pearl*
ATTORNEYS AT LAW
1875 Century Park East, 14th Floor
Los Angeles, California 90067
(310) 286-2035
Fax (310) 286-9735

January 10, 2000

*A PARTNERSHIP COMPRISED OF
PROFESSIONAL CORPORATIONS

REFER TO FILE NO.
N/A

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter - Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments:

1. Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

2. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

3. The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

4. The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and

with billions of dollars at stake, the health of our entire regional economy is impacted.

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Very truly yours,

FIELDS & PEARL

KENNETH S. FIELDS, A
PROFESSIONAL CORPORATION

KSF:nsp

RECEIVED
DEC - 8 1999
BY:.....

Thomas J. Fleming
507 Hill Street, #2
Santa Monica, CA 90405

December 5, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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Sincerely,

Thomas J. Fleming

Dec 9 '99

Lisa Kaas Boyle, Law and Policy Director
Heal the Bay
2701 Ocean Park Blvd., Suite 150
Santa Monica CA 90405

Lisa:

Enclosed is a copy of a letter I am sending to the WQB at Heal the Bay's request.

Also enclosed is a paper that describes the feasibility and advantages of integrating stormwater treatment and infiltration into urban redevelopment. The Nine Mile Run results have now been published in a beautiful report; you can find out about the document at rmi.org.

Bruce K. Ferguson
Professor, MLA Coordinator
School of Environmental Design
Caldwell Hall
University of Georgia
Athens GA 30602
phone 706-542-4704
fax 706-542-4236
bfergus@arches.uga.edu

The University of Georgia
School of Environmental Design

December 9, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles CA 90013

Dear Mr. Dickerson:

Treating or infiltrating urban stormwater can significantly reduce pollution in rivers and bays. You have the opportunity to do so with the proposal before you for development and redevelopment to treat or infiltrate the runoff generated by storms 0.75 inch and smaller.

Along the range of storms that designers around the country are accustomed to designing for, the 0.75 inch storm is small. It is very feasible, even easy, for development and redevelopment to design for a storm of this size. But according to my calculations, designing for this level of rainfall will effectively treat or eliminate the runoff from more than half of all the rain that falls in Los Angeles in an average year. Most of the runoff and almost all the pollution are in the small, frequent storms and in the first runoff from larger storms. So the 0.75 inch proposal identifies an approach that is at once both highly feasible and highly effective.

Any urban region like yours is constantly being built and rebuilt. One of the few things we can confidently predict about the future is that times will continue to change, as they have always changed in the past. Acting through the ongoing and inevitable economic process of development and redevelopment, an approach such as that of the 0.75 inch storm can transform the quality of the rivers, bays and beaches that receive the effects of urban runoff.

Design experience in your region and elsewhere have shown that it is entirely possible, and even desirable, to integrate the provisions of stormwater treatment and infiltration with urban land use, economic activity, and quality of life. Integration of these things produces not a "cost", but a more completely designed city.

Surely the rivers, bays and beaches that are loved by the people of your region and of all the world are reason enough to be protective of runoff quality.

Yours,

Bruce K. Ferguson, FASLA
Professor
MLA Coordinator

cc: Heal the Bay

R0069684

609 Caldwell Hall • Athens, Georgia 30602-1845 • (706) 542-1816 • FAX (706) 542-4485
An Equal Opportunity/Affirmative Action Institution

BRUCE K. FERGUSON is Professor of Landscape Architecture and Director of the Master of Landscape Architecture program at the University of Georgia. He is a landscape architect who has specialized in environmental management of urban watersheds for twenty years.

Ferguson's consulting projects have included stormwater quality protection at the Goddard Space Flight Center, conservation of irrigation water on the lawn of the White House, goals for urban water conservation in the California Water Plan, and urban design guidelines to protect runoff quality in the metropolitan regions of Atlanta, Pittsburgh, and San Francisco, and the states of Florida, Georgia, and New York.

His most recent book is *Introduction to Stormwater* (1998). He is also the author of *Stormwater Infiltration* (1994), which is the standard reference in its field, and 130 scientific and professional papers on environmental management of urban watersheds. Using the results of his research, he lectures at universities throughout the United States and conducts continuing education courses for design practitioners.

Ferguson is a Fellow of the American Society of Landscape Architects and a past president of the Council of Educators in Landscape Architecture. He is a recipient of ASLA's Bradford Williams Medal and CELA's Outstanding Educator Award, the highest award for landscape architectural education in North America.

Ferguson obtained the BA degree at Dartmouth College and the MLA at the University of Pennsylvania. He is a licensed landscape architect in Georgia and Pennsylvania.

Bruce K. Ferguson
School of Environmental Design, University of Georgia
Caldwell Hall, Athens, GA 30602
(706) 542-4720
fax (706) 542-4236
bfergus@arches.uga.edu

Date: 11/11/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,

Todd Flora

Name: TODD FLORA
Address: 850 2ND ST., #212
SANTA MONICA, CA 90403

R0069686

Date: 12/3/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Kathryn Gaffney

Name: Kathryn Gaffney, Registered Voter
Address: 1423 15th St.
Apt 7
Santa Monica, CA
90404 - 2722

R0069687

Date: 12-19-99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RECEIVED
1999 DEC 17 P 1:49
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely, Azure Gilman

Name: Azure Gilman
Address: 907 24th st Santa Monica, CA. 90402

R0069688

MJG

Madelyn Glickfeld
28907 Grayfox Street
Malibu, CA 90265
Tel: (310) 589-9110
Fax:(310) 457-5692

January 10, 2000

VIA FAX
2 pages

Mr. Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I am writing you again to ask you to take advantage of the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt a Standard Urban Stormwater Mitigation Plan for the cities in Los Angeles County that requires mitigation, by specified newand redevelopments, through treatment or infiltration, of 100% of the runoff generated by the first three quarters of an inch of rain, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and few measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington

Beach) - and with billions ofdollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Madelyn Glickfeld
President, MJG Consulting
Visiting Lecturer and Researcher,
UCLA Institute of the Environment

DOROTHY GREEN
801 HOLMBY AVENUE, LOS ANGELES, CA, 90024
310-270-4151 FAX: 310-270-4152

December 17, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

I, among many others, are concerned about the proposed storm water rule that will require the retention of water on site as a major way of alleviating some of our water quality problems.

As you know, the Los Angeles area is considered among the most polluted in the country, the landscape has been paved over, dramatically increasing both the amount of runoff, and the amount of pollution contained in that runoff. As the city is rebuilt, and most of it will be within the next 50 years, it is incumbent on all of us to do whatever we can to alleviate this problem and the public health issues which come as a direct result.

There are other benefits that can come from retaining storm water on site. Principal among them is augmenting our drinking water supply. About a third of our water supply comes from local ground water resources. As the city has been paved over, much less water is able to infiltrate into the ground. Only 5% of one inch storms historically ran off. Now about 50% of small storms are directed into our storm drain systems, and run off. This water should be captured so that we can lessen our need to import water from so far away.

For these and many other reasons, I am asking that you approve your staff's recommendations to require the retention of all ¾ inch storms on site for new construction. This is the least we can do to ensure healthy beaches, and coastal waters, cleaner rivers and streams.

Thank you for your kind consideration.

Sincerely,

Signed

Post-it® Fax Note 7671	Date	# of pages ▶
To Lisa Boyle	From	
Co./Dept. LARB	Co.	
Phone #	Phone #	
Fax # 310-581-4195	Fax #	

R0069691

Date: 12/9/99

RECEIVED
2000 DEC 14 P 1:33
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Tessy Anna Hakkinen

Name: TESSY-ANNA HAKKINEN
Address: 737 N. EDINBURGH AVE
LA CA 90046

R0069692

Christine Halley
28028 Marguerite Pkwy #0
Mission Viejo, CA 92692

RECEIVED
99 DEC 28 P 2:09
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

December 16, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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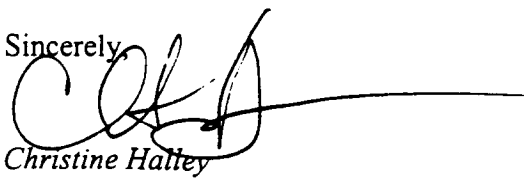
In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

R0069693

Sincerely,



Christine Halley

Date: 12/14/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RECEIVED
1999 DEC 17 P 1:49
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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Sincerely,

Dayna Harary

Name: Dayna Harary
Address: 10853 Rose Ave. #H
LA, CA 90034

RECEIVED
DEC - 8 1999
BY:.....

Date: 12/6/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Debra O'Hare

Name: DEBRA O'HARE
Address: 196 Stonehaven Ln
Oak Park, CA 91377

R0069696

363 North Carmelina Avenue
Los Angeles, CA 90049

January 10, 2000

Mr. Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: SUPPORT FOR THREE QUARTER - INCH STANDARD TO REDUCE RUNOFF FROM NEW AND REDEVELOPMENT

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt a Standard Urban Stormwater Mitigation Plan for the Cities in Los Angeles County that requires mitigation, by specified new and redevelopments, through treatment or infiltration, of 100% of the runoff generated by the first three quarters of an inch of rain, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and few measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

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In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Matthew J. Hart

MJH/yct

January 18, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I wanted you to know that after five years of research, the Los Angeles based environmental organization TreePeople has demonstrated the benefits and feasibility of capturing rainwater and recycling it. TreePeople brought together leading experts to develop best management practices, and then showed how easily they could be implemented.

Now, you have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

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We've shown that it is feasible. Now it is up to you to ensure that it actually happens.

Thank you for your consideration.

Sincerely,

Andrew Hall

2712 Cassiano Road
Los Angeles, CA 90077

R0069699

11-327

Date:

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles. California 90013

RECEIVED
1999 DEC 28 P 2:08
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

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Sincerely,

Stacey T Hull

Name: Stacey T Hull
Address: 918 Rose Drive
Glendora, CA 91741

Date: 12/14/99

RECEIVED
1999 DEC 20 P 1:28
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,

Alex Hutchens

Name: Alex Hutchens
Address: 15200 Friends St.
Pacific Palisades, CA 90272

Date:

RECEIVED

2000 JAN -3 P 1:57

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Hona Hyun

Name: Hona Hyun
Address: 401 Charles E. Young Dr. West #436
Los Angeles, CA 90024

Date:

RECEIVED
2000 DEC 14 P 1:31
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Name: TAKURO MOGAWA
Address: 3418 GARNET ST
TORRANCE CA 90503

R0069703

Date: 11-27-99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Charleene Johnson

Name: Charleene Johnson
Address: 3421 Mulholland Hwy
Malibu, Ca 90265

R0069704

Dr. Mha Atma Singh Khalsa
1536 Crest Drive
Los Angeles, CA 90035

January 6, 2000

Dennis Dickerson
Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th St. #200
Los Angeles, CA 90013

Dear Mr. Dickerson,

Our current managment of urban runoff contributes greatly to coastal and ocean pollution, and encourages both flooding and the channelization of our streams as we attempt to prevent flooding. I strongly urge that we institute massive changes to our ineffective approach.

The recommendation by the Water Board's staff to require new development and redevelopment projects to be designed to retain rainfall of up to .75 inches daily would be a huge step in the right direction. Adoption of the recommendation would bring areas in incorporated cities up to the same standards already in place in unincorporated areas of the county. This proposal would be good for the health of local aquatic life, for the health of the 60 million people who visit L.A. County beaches each year, and for a more livable healthy region.

I urge you to adopt this important proposal.

Sincerely,

Dr. Mha Atma Singh Khalsa

January 19, 2000

RECEIVED

2001 JAN 20 P 2:10

Mr. Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

QUALITY CONTROL BOARD
LOS ANGELES REGION

Dear Mr. Dickerson:

I am a member of the Board of Directors of TreePeople, and I wanted you to know that after five years of research, TreePeople has demonstrated the benefits and feasibility of capturing rainwater and recycling it. TreePeople brought together leading experts to develop best management practices, and then showed how easily they could be implemented.

Now, you have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

We've shown that it is feasible. Now it is up to you to ensure that it actually happens. Thank you for your consideration.

Sincerely,

Jan B. King
Member of the Board of TreePeople

RECEIVED
JAN 10 2000
BY:.....

Dennis Dickerson, Executive Director
and Members of the Board
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

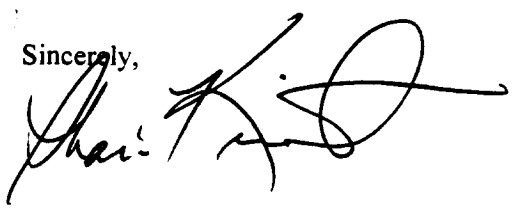
RE: Support for Runoff Controls on New and Redevelopment

Dear Mr. Dickerson and Members of the Board:

I urge you to adopt on January 26, 2000, a reasonable standard to address polluted runoff from development projects in the Los Angeles metropolitan area. In a region that is constantly being built and rebuilt, these types of controls are necessary to reduce the amount of polluted runoff that invades our streams, rivers and coastal waters.

At a minimum, please ensure that specified new and redevelopments capture, treat, or infiltrate the runoff generated by a 0.75 inch storm. Many other areas of the country have already adopted similar or more stringent standards. By adopting this proposal, you and the Regional Board can take a significant step in water quality protection.

Sincerely,



Date: 12/1/99

RECEIVED
DEC - 3 1999
BY:

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely, [signature] 12/1/99

William Kozma, JR

Name: 6994 wildlife rd
Address: Malibu, Ca ~~[illegible]~~ 90265

R0069708

KUDO & DANIELS, LLP
ATTORNEYS AT LAW

12400 WILSHIRE BOULEVARD, SUITE 400
LOS ANGELES, CALIFORNIA 90025-1023
TELEPHONE (310) 442-7900
FACSIMILE (310) 442-7999

RICHARD K. KUDO
PAULA A. DANIELS
JUDY C. MA
NICOLE M. FOOS

November 8, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Re: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

On January 6, 2000, you and the Board have the opportunity to change our course toward worsening water pollution by adopting the proposal, set forth by your own staff, to require that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to a three quarter-inch storm (i.e., 85% of all storms in this region).

The Los Angeles Region already suffers from some of the worst water quality in the nation. Your staff proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem." The recent disastrous experience with beach closures in the city of Huntington Beach underscores the need for these measures.

In a region that is constantly being built and rebuilt, adoption of your staff proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more

livable Los Angeles, please support your staff proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Paula A. Daniels

PD:db

G:\WP\9000.05\LDICKER.001

bcc: Lisa Boyle

Date: 13 December 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

2001 JAN -5 P 2:05

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Name: JENNIFER L. LAIRD
Address: 10949 FIELDLAND DR #15
STUDIO CITY CA 91604

R0069711

Jon M. Leader
907 Hanley Avenue
Los Angeles, CA 90049

December 14, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION
RECEIVED
1999 DEC 15 P 1:44

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 6, 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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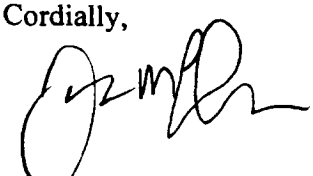
In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Cordially,



From: Xavier Swamikannu
To: Jorge LEON
Date: 10/7/99 4:56PM
Subject: SUSMPs and Mitigation Measures - Possible Approach

Dennis and I are in the process of scheduling meetings with the different interests on the issue of SUSMPs and mitigation measures. I briefly discussed a possible strategy with you earlier to avoid a situation where there is apparent conflict with the language of the permit and an action invited by the Regional Board.

First, the LA County permit requires that the permittees submit the SUSMPs for Regional Board Executive Officer approval. It does not explicitly require that numerical mitigation measures be included to deem the SUSMPs approvable. It is a technical judgement by staff that proposing mitigation BMPs without a numerical mitigation measure for performance does not meet the test of "reduce pollutants to the MEP" for new development.

So, the Regional Board Executive Officer has the authority to approve the SUSMPs and leave the numerical mitigation measure for separate action by the Regional Board. An appropriate statement should be included in the SUSMPS that ties the standard of performance for treatment BMPs to the numerical mitigation measure(s) adopted by the Regional Board.

Second, such an action will be consistent with the language in the Long Beach MS4 permit which makes all SUSMP provisions adopted by the Regional Board applicable to the Long Beach permit as well. Regional Board Executive Officer approval of the SUSMPs alone with a numerical mitigation measure would still leave open the question of appliacability to the Long Beach permit without formal Board action.

Third - State Board storm water permit for construction activity (Order No. DWQ 99-08) on projects five acres or greater includes requirements for post-construction BMPs. These permits are enforced by the Regional Board for the Los Angeles Region. To be consistent we should make the same mitigation measure applicable to post construction BMPs under this permit for the Los Angeles Region. Public notice and formal Board action will be necessary to do that. The City of LA pointed out this potential inconsistency without such an action.

Fourth - The County of Ventura has proposed an alternative mitigation measure [70 percent annual runoff volume treatment] which is equivalent to [85 percentile runoff event treatment] and the [0.75 inch which is the 85 percentile rainfall event treatment]. Board action will be required to include this option as an adopted numerical mitigation measure.

In conclusion, my suggested approach is that we discuss text changes and concerns with the interested parties and with permittees. The Executive Officer approves the SUSMPs with language changes after input from the meetings with a reference to the numerical mitigation measure but not specific numerical approaches.

That the Regional Board at a meeting consider approval of the three numerical appraoches so that the action is comprehensive and will cover post-construction BMPs (planning BMPs) for LA County, Ventura County, and State Construction permit.

Do you concur?

CC: Dennis Dickerson

Date: 12/7/99

RECEIVED
DEC 10 1999
BY:.....

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Name: DANIEL LINDE
Address: 928 7th ST #4
SANTA MONICA, CA
90403

RECEIVED
DEC - 8 1999
BY:

Jeff Littrell
1601 N. Sepulveda Blvd #148
Manhattan Beach, CA 90266

December 5, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Jeff Littrell

11 294

William E. Lloyd, Jr.
Attorney and Counselor at Law
SUITE 1250
9401 WILSHIRE BLVD.
BEVERLY HILLS, CA 90212
Voice: (310)276-5300
Facsimile: (310)276-2381
E-Mail: willoyd@ispwest.com

RECEIVED
DEC - 8 1999
BY:.....

December 7, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Very truly yours,

William E. Lloyd, Jr.

WEL:dg

Julia Louis-Dreyfus
2029 Century Park East #500
Los Angeles, CA 90067

30 November 1999

Mr. Dennis Dickerson
Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street #200
Los Angeles, CA 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. Brought to this point by extensive development, with a complete disregard for the quality and quantity of runoff generated. Today, approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs, untreated, into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

On January 6, 2000, you and the Board have the opportunity to change our course toward worsening water pollution by adopting the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to a three quarter-inch storm. The Los Angeles Region already suffers from some of the worst water quality in the nation. Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach...[that] could well keep ocean pollution from worsening and help prevent beach closing," and a "good start in dealing with a tough problem."

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Julia Louis-Dreyfus

R0069718

11-373

P.1
4-05-1998 4:56AM FROM

Dear Ms. Dickerson,

I'm writing to encourage the water board to develop projects which would retain rainfall up to .75 inches per day. The current methods of quick water runoff to the L.A river have so many faults. Things need to spread out & have time to seep into the soil. Please reevaluate. Thank you

Karen Malley

R0069719

December 7, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Support for Staff Proposal to Reduce Runoff New and Redevelopment.

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set for by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening

water pollution.

We have been brought to this crossroads by extensive developement that completely disregards the quality and quantity of runoff generated. The Los Angeles Region Already Suffers from Some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, Industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measureable requirements in the municipal storm water permits we have countless beaches that frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and coastal waters that pose health risks to aquatic life.

R0069721

Your staffs proposal is supported by the "Los Angeles Times" in its

October 6th editorial as a "promising New approach ... [that] could well keep ocean pollution from worsening and help prevent beach closing;" and a "good start in dealing with tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

- In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amout of polluted runoff that invades our streams, rivers and coastal waters, for the health of local aquatic life, for the health of 40 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, Please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment

Sincerely

Sofia Mas

Sofia Mas
5312 Carteen Pl #14
N Hollywood, CA 91607

RECEIVED
1999 DEC 17 P 1:53
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Date: 12-14-99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Rachel McNevin

Name: Rachel McNevin
Address: 728 24th street
Santa Monica, CA
90402

R0069724

Date: Dec. 4, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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Sincerely,

Penelope Moffet

Name: Penelope Moffet
Address: P.O. Box 24936
Los Angeles, CA
90024-0936

R0069725

Jan. 19, 2000

3630 Kelton Ave.
Long Beach CA 90810

Dennis Dickerson, Director
L.A. Regional Water Quality Control Bd.
320 W. 4th St. LA 90013

RE: Jan. 26 hearing on storm water retention

Dear Mr. Dickerson:

I have been concerned with storm water run-off for years, since I live near the mouth of The Los Angeles River, and have seen the tremendous pollution that comes down into the Long Beach ocean waters and beaches.

I am delighted that the Federal Govt. is requiring cities to retain .75" of water on any new building development, even though I consider this too little an amount.

Please stand firm in the face of cities which do not want to comply.

Water retention on new building projects is Federal law, and costs very little to achieve, and is already being implemented in Long Beach by the River Glen Estates building 18 single family homes at 3000 San Francisco St., Long Beach 90806.

Thirty-two other cities with more rainfall have more strict water retention laws. Southern California needs water retention more than any other State!

Sincerely,

Barbara Morel

(562) 424-3168 11-330

R0069726

Gabriele Morgan
2402 3rd St #107
Santa Monica, CA 90405

December 10, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 6, 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable

Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Gabriele Morgan

R0069728

John & Lynn Murdock
1209 Pine Street
Los Angeles, CA 90405

RECEIVED
DEC 10 1999
BY:.....

December 8, 1999

Dennis Dickerson, Regional Director
RWQCB
320 W. 4th Street, Suite 200
Los Angeles, CA 90013-1105

Re: Runoff Standards

Dear Mr. Dickerson:

This letter is written to express our strong support for adoption of numeric performance standards to control pollution from commercial runoff.

We live in a coastal community and have a small child, therefore we have numerous occasions to witness the impact of run-off on the ocean water quality after heavy rains. It has become clear beyond peradventure that unless we, as a society, don't take strong measures to control the amount of pollutants that are swept into the bay from storm-water run-off, we will continue to experience a degraded, disease-ridden bathing quality at the beaches near urban centers. California cannot turn a blind eye to the evidence. It requires courage and fortitude to insist on measures that are surely unpopular in the eyes of commercial developers who insist they will be hampered and burdened by more and more regulation. Nevertheless, as a society we have voted to use tax dollars to establish an agency called the "Regional Water Quality Control Board" and we as taxpayers must now insist that our money be used exactly for that purpose - to "CONTROL" the water quality by imposing standards that can be quantified. Only with enforceable standards can we expect to have meaningful, measurable improvement. The alternative - increasing degradation and disease - is completely unacceptable.

We are consumers. We expect to be customers and buyers of the commercial goods and services provided by urban development. As such, we acknowledge that imposing enforceable standards may lead to higher costs for developers and that these costs will be passed on to us as consumers.

We taxpayers have already ACCEPTED this reality by creating an agency called the Regional Water Quality Control Board, which we know leads to higher costs for business which we patronize. This is obviously the cost of cleaning up our environment. We are willing to pay our taxes and to pay your salaries, and we are willing to pay the higher costs we face as a result of regulation.

We are **NOT** willing to pay our taxes for your salary if you fail to do that for which you have been hired. We are angry that the Board has postponed this matter from September to January, and we request that positive, aggressive action be taken with all deliberate speed and rectitude.

Thank you for your attention. We would welcome your views in reply.

Very truly yours,

John & Lynn Murdock

JBM:ly

Date:

RECEIVED

1999 DEC 21 P 2:42

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Name: Cristie Moon
Address: 1902 [redacted] #6
Pacific Ave
Venice CA
90291

R0069731

W. Scott Norton, Attorney at Law
1857 N. Kingsley Dr.
Los Angeles, California 90027

January 21, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt a Standard Urban Stormwater Mitigation Plan for the Cities in Los Angeles County that requires mitigation, by specified new and redevelopments, through treatment or infiltration, of 100% of the runoff generated by the first three quarters of an inch of rain, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

I know this is a form letter but wanted you to do this. WSN

As a surfer, I can personally attest to the damage to local water safety in the aftermath of any kind of significant rainfall. I, and many of my friends, have become ill while surfing immediately after a significant storm. Trust me when I say the problem is not imaginary.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation. and few measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

11-359

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Regards,

W. Scott Norton, Attorney at Law

R0069733

11-360

Date: 12/9/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RECEIVED
1999 DEC 14 P 1:33
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

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Sincerely,

Name: EDVART OURDUKHANIAN
Address: 6842 VALMONT ST. TUJUNGA CA. 91042

R0069734

Date: 11/17/99

RECEIVED
1999 DEC 16 P 1:59
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

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Sincerely.

Sarah Pape

Name: Sarah Pape
Address: 1600 Campus Rd. Box 609
L.A., CA 90041

R0069735

Robert Pitt, P.E., Ph.D., DEE
Professor, Department of Civil and Environmental Engineering
University of Alabama at Birmingham
1075 So. 13th St.
Birmingham, AL 35294-4440

January 13, 2000

VIA FACSIMILE (213/576-6660) and *U.S Mail*

Executive Officer and Members of the Board
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Proposed Model Standard Urban Storm Water Mitigation Plan (SUSMP)

Dear Mr. Dickerson and Members of the Board:

I have reviewed the proposed *Standard Urban Stormwater Mitigation Plan for Los Angeles County and Cities in Los Angeles County* and wish to make the following general comments.

I support the Regional Water Quality Control Board's adoption of the proposed 0.75 inch standard for the design of best management practices. Many municipalities around the country have implemented standards at least as stringent as this one to minimize the stormwater pollution from new development and redevelopment, and this standard is an entirely reasonable one.

However, the current proposal includes a host of exemptions that are overly-broad and that significantly weaken the impact of the numerical standard. The 0.75-inch standard should be adopted, but it should not be subject to the waivers and other exceptions currently contained in the proposed Mitigation Plan. The rooftop exception is particularly troubling, as many researchers have found rooftops (and associated roofing materials) to be an important source of stormwater pollutants and excessive flows. By eliminating these flows from treatment and from the runoff calculations, the effectiveness of the stormwater Mitigation Plan will be significantly reduced.

Sincerely,

Robert Pitt, P.E., Ph.D., DEE

R0069736

Date: December 7, 1999

RECEIVED
DEC 10 1999
BY:----------

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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Sincerely,

Liz Provencher

Name: Liz Provencher
Address: 12207 Rochester Ave. #5
Los Angeles, CA 90025

R0069737

X5

Date:

RECEIVED
2000 FEB -1 P 2:12
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,

Name: DENNIS PYSZ
Address: 33751 VIOLET LANTERN
APT. A
DANA POINT, CA
92629

R0069738

RUBY RAITT
2509 OCEAN AVE.
VENICE, CA 90291

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RECEIVED
1999 DEC 16 P 1:58
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. In January 2000, I urge you to adopt the reasonable proposal set forth earlier this year by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Ruby Raitt

11-293

R0069739

Date: 12/2/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

R. Grant Ramey

Name:
Address:

R. GRANT RAMEY
118 WADSWORTH AVENUE, #3
SANTA MONICA, CA 90405-3836

RECEIVED
2000 DEC 15 P 1:44
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Date:

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Kazim Raza

Name: SYED KAZIM RAZA
Address: P.O. BOX 16273
ENCINO
CA 91416

R0069741

Robert A. Roth
ATTORNEY AT LAW

15332 ANTIOCH STREET, #533
PACIFIC PALISADES, CALIFORNIA 90272

AREA CODE 310
207-2121

December 8, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality
Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline

11-281

R0069742

declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Very truly yours,

Robert A. Roth
RAR/pc

RECEIVED
2000 JAN 26 P 2:11
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Gregory L Sandefur
346 Virginia St #1
El Segundo, CA 90245

January 24, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt a Standard Urban Stormwater Mitigation Plan for the Cities in Los Angeles County that requires mitigation, by specified new and redevelopments, through treatment or infiltration, of 100% of the runoff generated by the first three quarters of an inch of rain, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

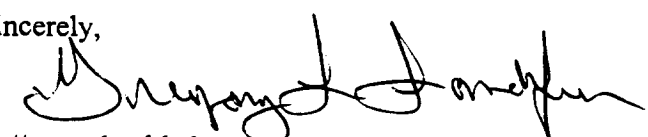
Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and few measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,



R0069744

Gregory L Sandefur

Date: 11/11/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Karineh Santk'ian

Name: Karineh Santk'ian
Address: 3765 Pennsylvania Ave
La Crescenta, CA 91214

R0069746

Elizabeth Schuster
485 West California Blvd.
Pasadena, CA, 91105

RECEIVED
DEC 28 P 2:06
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

December 8, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 6, 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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Sincerely,

Elizabeth Schuster

R0069747

From: "Neal Shapiro" <Neal-Shapiro@ci.santa-monica.ca.us>
To: <DDickers@rb4.swrcb.ca.gov>, <XSWAMI@rb4.swrcb.ca.gov>
Date: 1/13/00 9:51AM
Subject: Meet w/You

Dennis, Xavier:

Craig Perkins and I would like to meet with you to discuss Santa Monica's take on the SUSMPs, next Thursday, January 20 early afternoon, like 1 PM. We have a 3 PM back in Santa Monica. If that doesn't work, are you available in the later morning, though I have a meeting with Bureau of Reclamation at MWD office at 9 AM.

Please let me know at your earliest convenience.

Also, please make a note in your scheduling that Craig requests the opportunity to make a short presentation on the City's perspective at the Regional Board meeting January 26th.

thank you,
neal

Date: 11-24-99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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Sincerely,

Bonnie Shatz

Name:
Address:

WWF
SAVING LIFE ON EARTH

Bonnie M. Shatz
855 3rd St Apt 110
Santa Monica CA 90403-1110

R0069749

Date:

RECEIVED
1999 DEC 16 P 1:57
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,

Stephanie Schroeder

Name: Box 702 1600 Campus Road
Address: Los Angeles, CA 90041

Stephanie T. Schroeder

R0069750

Date: 12.14.99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RECEIVED
99 DEC 16 P 1:59
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

H. Shulman

Name: Hannah Shulman
Address: 10335 Tennessee Ave
LA, CA 90064

R0069751

Date: 12/2/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Madeleine Silwad

Name: Madeleine Silwad
Address: Crossroads School
1714-21st St.
Santa Monica, CA 90404

Positively Organized!

January 26, 2000

RECEIVED
2001 JAN 27 P 2:29
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I do hope that today you voted to reduce urban runoff, the number one source of pollution to our coastal and inland waters by adopting a Standard Urban Stormwater Mitigation Plan for the Cities in Los Angeles County.

By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution. As you may know, today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem." The three quarter-inch standard also makes economic sense.

For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please, if you haven't done so today, adopt the three quarter-inch standard as soon as possible, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Thank you. I would appreciate the courtesy of a reply by mail or e-mail: PosOrg@aol.com

Sincerely,

Susan Silver

RECEIVED
2001 JAN 27 P 3:30
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

PO Box 491549, Los Angeles, CA 90049-9549 310/471-4113 fax: 310/476-2070 e-mail: PosOrg@aol.com

R0069753

POST OFFICE BOX 4996
LOS ANGELES, CALIFORNIA 90049

LAW OFFICES OF
EMILY SIMON

TELEPHONE (310) 440-1046
FACSIMILE (310) 440-1056
E-MAIL: elsgypsy@email.msn.com

January 18, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I am the vice chair of the Board of Directors of TreePeople, and I wanted you to know that after five years of research, TreePeople has demonstrated the benefits and feasibility of capturing rainwater and recycling it. TreePeople brought together leading experts to develop best management practices, and then showed how easily they could be implemented.

Now, you have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in

the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

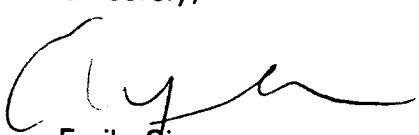
The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

We've shown that it is feasible. Now it is up to you to ensure that it actually happens.

Thank you for your consideration.

Sincerely,



Emily Simon
Vice Chair, Board of TreePeople

UNIVERSITY OF CALIFORNIA, LOS ANGELES

MICHAEL K. STENSTROM, Ph.D., P.E.
Professor of Civil Engineering
School of Engineering and Applied Science
stenstro@seas.ucla.edu
www.seas.ucla/stenstro

Civil and Environmental Engineering Department
4173 Engineering I
Box 951593
Los Angeles, California 90095-1593
(310) 825-1408
(310) 825-3335
Fax: (310) 206-5476

September 15, 1999

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

I am writing to you in support of a proposal to require new development to meet stricter stormwater standards by requiring the first 0.75 inches of rain fall to either be treated or captured for infiltration. Such a requirement would greatly reduce stormwater pollution to Santa Monica Bay and other receiving waters.

There are several methods that can be used to accomplish these results. We have been working for more than 18 months to develop and evaluate catch basin inserts to capture liter and filter stormwater to remove sand-size particles and free oil and grease. At present it appears that these devices may cost less than $500 each and require cleaning only once or twice per year. We have evaluated devices that can treat as much as 0.5 ft^3/sec in a single catch basin. This device could treat a 0.75-inch per hour rainfall from a 0.5-acre parking lot.

There are other methods in addition to inserts. I have attached a figure from a previous paper that shows a method of percolating stormwater without flood risk. I published this paper in 1986. Since then several agencies have successfully evaluated full-scale methods generally the same as shown in the figure. Porous pavement and a variety of screens also exit.

In support for this proposal, I also offer another result from our research. Our modeling efforts, which I believe are the most advanced and accurate for this application, show that the largest source of the majority of types of water quality contaminants to Santa Monica Bay, is stormwater. This is a result of the implementation of full secondary treatment at Hyperion. Future water quality improvements to the Bay, and I believe to other ocean waters in your region, will depend upon reducing stormwater pollution.

The application of the proposed requirement will not be without cost; however I believe it is affordable for new development, especially for parking lots, which have tend to contribute higher pollutant loads per unit area. Also, parking lots generate revenue, which can be used to pay for pollution control.

Very truly yours,

Michael K. Stenstrom, Ph.D., P.E.

CC:

Xavier Swamikannu
Mark Gold

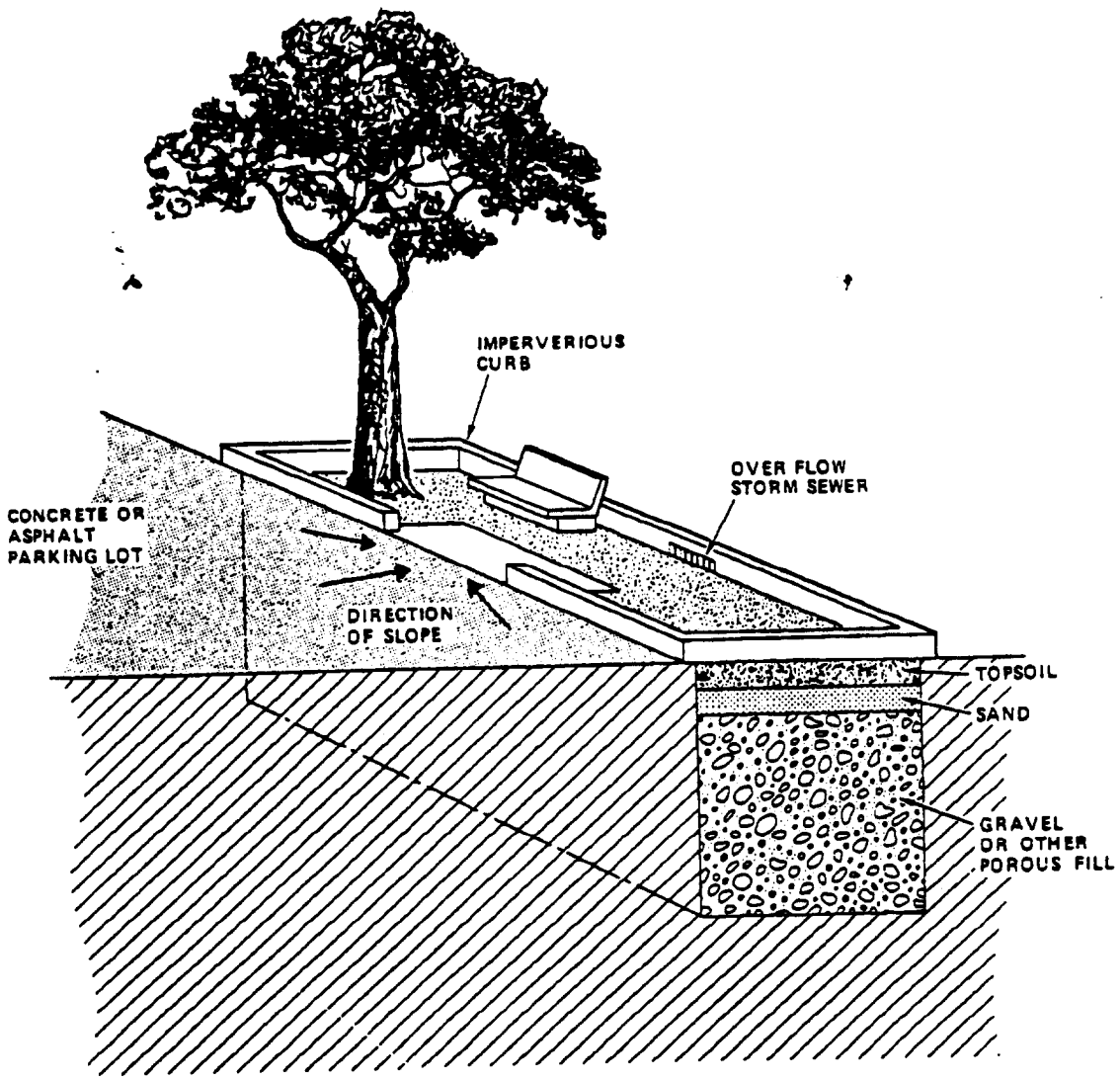


Figure 2. Hypothetical Application of a Greenbelt in a Parking Area.

sites where marshes have been dredged, filled, and/or channeled and which could be developed as wetlands.

Little information is available regarding the effectiveness of wetlands in removing oil and grease from stormwater runoff (Chan et al., 1981). Since the majority of oil and grease in runoff is normally found associated with particulates, it is reasonable to assume that wetlands would act primarily as a sedimentation trap. Pollutant removal from the water column would occur as the particulates settle, with degradation responsible for their ultimate elimination. The removal of other pollutants besides oil and grease would also be anticipated. An accurate assessment of oil and grease removal potential could not be made until pilot studies were conducted.

The costs of wetlands appear relatively high. Wetlands require a substantial quantity of land. Construction costs for the first wetland areas would probably be higher than those for wetlands built after the technology was fully developed because of the increased safety factors needed to account for design uncertainties. But the high initial construction costs usually would be less than the cost of conventional wastewater treatment plants.

While wetland development would be relatively expensive, its value would not be limited to water treatment. Wetlands are being restored and developed around the Bay Area because of their aesthetic, wildlife and recreational values. In some cases, integrating water quality considerations into plans for enhancing wetland resources could

RECEIVED
00 DEC 16 P 1:59
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Date:

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Name: Sarah Studer
Address: 1600 Campus Rd, 1140
Los Angeles, CA 90041

R0069759

Date: December 11, 1999

RECEIVED
99 DEC 14 P 1:34
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Name: ANNE SLATER
Address: P.O. BOX 251289
LOS ANGELES, CA 90025

R0069760

RECEIVED
JAN 18 2000
BY:.....

Greg Sweel
1920 6th Street #343
Santa Monica, CA 90405

January 13, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

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Sincerely,

Greg Sweel

11-316

From: "R. Tahir" <tecsenv@yahoo.com>
To: Dennis Dickerson <DDICKERS@rb4.swrcb.ca.gov>
Date: 1/11/00 4:16PM
Subject: Proclamation

Is this okay with you? We can't over do it because of the SUSMP disagreement, which may lead to litigation (Ruttan and Tucker is on deck to prepare the petition for the COGS/cities should challenge become necessary).

I'll try to get as many cities to adopt it as possible.
To be candid with you Dennis, it will be easier to cities adopt this thing as long as there is the real possibility that mandatory numeric runoff retention/treatment requirements are tossed-out. The assignment of retention/treatment controls should be at the discretion of the city -- as the permit clearly intended -- using authoritative information justifying them (e.g., the basin plan, ocean plan, monitoring data.

We thought about giving in on the mandatory retention/treatment controls for parking lots associated with commerical developments, industrial, and manufacturing but decided not to lest it create a bad precedent: basing a decision on political compromise rather than on rationality.

However, I don't think that cities would be averse to mandatory retention/treatment controls for those industrial facilities requiring General Industrial Activity Storm Water Permits, as long as the regional board is willing to assume responsibility for their proper maintenance.

If you have any questions, please call me (626.396.9424).

Ray

Do You Yahoo!?
Talk to your friends online with Yahoo! Messenger.
http://im.yahoo.com

From: "R. Tahir" <tecsenv@yahoo.com>
To: Dennis Dickerson <DDICKERS@rb4.swrcb.ca.gov>
Date: 12/17/99 6:24PM
Subject: January 6 Public Hearing

Hi Dennis:

Can I get 10-15 minutes of time at the January 6th public hearing. I plan to present concerns about the over-estimated catch basin inserts and other issues.

Also, I think Eileen and/or Margaret want to say something on behalf of SCAGs/EEC.

FYI, South Bay Cities COG adopted a resolution a couple of weeks ago calling for the regional board not to make
storm water numeric standards mandatory -- under any guise, including design standards for parking lot ollution reduction controls. The reso also authorizes the COG prepare a petition to the state water resources control board in the event the regional board ingores its plea. The SGVCOG the same action last night and the
Gateways Cities COG is expected to follow suit at its January 6th monthly meeting.

I think, however, that if you can get the environmental community and/or the board to buy-off on the following changes such action can be averted: (1) inorease the threshold for triggering mandatory parking lot pollution reduction controls from 25 spaces/5k sf to 200 spaces/40k sf; (2) relax the waiver requirements to
allow cities base the cost savings that areto be transfered to some sort of storm water fund on the least costly control (viz., catch basin inserts; (3) clearly allow cities to prohibit the use of infiltration systems where the water table is lower the 10 feet, with good reason of course; (4) re-define some of the terms (e.g., slopes); (5) allow cities to base the definition of an ESA on CEQA, exclusive of any other interpretive defintion (e.g., fish and game);
and (6) use the development planning model program -- not the SUSMP as the place where ESAs and parking lots should be addressed (create a checklist "C").

Further, tell Mark that the issue more stringent parking lot controls could be dealt with under the next
permit, but must be justified ON THE PROTECTION OF WATER QUALITY STANDARDS (using the basin plan, ocean plan, or authoritative monitoring data).

I'll call you on Monday Dennis. Good luck with the

Alameda Corridor issue. We know that you're getting beat up unfairly -- again.

Ray

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Date: 12/1/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

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Sincerely,

Rich Thigpen

The Honorable Senate of the United States

Mr. Rich Thigpen
Unit 1219
6000 Canterbury Dr
Culver City CA 90230-6810

From: "Piasky, Tim" <TPIASKY@dpw.co.la.ca.us>
To: "'DDICKERS@rb4.swrcb.ca.gov'" <DDICKERS@rb4.swrcb....
Date: 9/28/99 1:34PM
Subject: SUSMP wording

Our wording for the 0.75 standard is as follows: "The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system."

This wording is not in any County Ordinance or Code. Also we have received several comments about this wording having the implication of having to treat more than one storm. The question has arisen, "What if there are two storms within a short time period? Does the BMP need to be designed to mitigate both storms or possibly 1.5 inches of rainfall?". It is our intend and understanding that the BMPs will need to be designed to mitigate the runoff generated from a storm event of up to and including 0.75-inches of rainfall. The design criteria to be used for each selected BMP will detail the emptying or residence time to be used for proper BMP design. Our SUSMPs can be obtained at the following URL:
http://dpw.co.la.ca.us/epd/mitigation/lacdpw.htm

CC: "Grant, Terri" <TGRANT@dpw.co.la.ca.us>

Date: 12/9/99

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1999 DEC 16 P 2:01
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Celine Jorbert

Name: 2148 Beachwood Terrace
Address: Los Angeles, CA 90068

R0069767

Date: 12/13/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

2001 JAN -5 P 2:05

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

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Sincerely,

Name: HAO TRAN
Address: 3372 EARLSWOOD DR.
ROSEMEAD, CA 91770

R0069768

January 11, 2000

Dennis Dickerson,
Executive Director
Los Angeles Regional Water
Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

RE: RUNOFF STANDARDS FOR NEW DEVELOPMENT AND REDEVELOPMENT

Dear Mr. Dickerson:

The Environmental Defense Center (EDC) is a non-profit environmental law firm working to protect and restore watersheds and water quality on the Central California Coast.

We are writing to remind you that you have the opportunity to significantly reduce urban runoff, the number one source of pollution in our coastal and inland waters. As we are grappling with the same runoff issues to your north, we look to your Board to set a precedent for water pollution control. Therefore, please adopt reasonable design standards for sizing treatment control Best Management Practices at specific new developments and redevelopment projects. Additionally, please make sure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. Another standard for development projects is to require bio-filtration basins (a.k.a. constructed wetlands) for urban stormwater runoff in project designs. Reduce reliance on storm drains, and incorporate vegetated swales and basins in project designs. By adopting these standards, the Regional Water Quality Control Board has the opportunity to reverse the trend of watershed and water quality degradation, and to set a precedent for improvements in other areas.

In urban environments, rainfall is converted into runoff that collects pollutants as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled in stormdrains and culverts and directed untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, southern California has countless beaches that are frequently unsafe for swimming. Creeks have water that is unsafe to touch, and inland and coastal waters that pose health risks to aquatic life.

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In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will reduce the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 100 million people who visit this region's beaches annually, for the health of our regional economy, and for a more livable region, please adopt the three quarter-inch standard and other design standards that reduce polluted runoff.

Sincerely,

_____

Brian Trautwein
Environmental Analyst

Printed on 100% Recycled Paper

Date: 12-15-99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

RECEIVED
DEC 28
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopment projects capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening ocean pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

John Treanor

Name: John Treanor
Address: 50 Rose Ave #3
Venice, CA. 90291

Pete & Michele Weeger
2656 Fabuco Road
Topanga, CA 90290
310-260-9118

RECEIVED
2000 JAN 25 P 2:02
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

January 21, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan/ Tuna Canyon

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

As a Southern California resident and property owner, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from stormwater run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Boards efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams, wetlands, bays and the ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that has made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definition for "Hillsides," "Parking Lots," and "Environmental Sensitive Areas" have been dramatically changed since the September 16, 1999 Board hearing. These new definitions have not been discussed yet in a public hearing or with the regulated communities.

Definition of Hillsides

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, we suggest that the

Board to modify the definition as property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county).

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Pete & Michele Weeger
Property Owners
2656 Fabuco Road

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

RECEIVED
1999 DEC 16 P 1:58
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Date: 11/17/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Kelly Swegan

Name: Kelly Swegan
Address: Box 502
1600 Campus Rd.
Los Angeles, CA 90041

R0069774

Dear Mr. Dickerson,

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our costal and inland waters. On January 26, 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. Thank you.

Sincerely,

Joe Weichman
959 Princeton St.
Santa Monica, CA 90403

RECEIVED
2000 JAN 27 P 4:20
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

RECEIVED
1999 DEC 27 P 1:41
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

R0069775

From: Johnson Wendell <WJohnson@tormet.com>
To: "'Xavier Swamikannu'" <XSWAMI@rb4.swrcb.ca.gov>
Date: 9/23/99 5:18PM
Subject: RE: SUSMP Comment

I sat down today and reviewed the guidelines and found nothing which was not already being implemented due to zoning, flood control and current material handling (i.e. fuel storage). The County did a good job on these standards, you guys should stick to your guns and approve them with the numerical guideline of .75" if the site fails to meet the 21%, 42% and 68% impervious area ratio.

From: Xavier Swamikannu [SMTP:XSWAMI@rb4.swrcb.ca.gov]
Sent: Thursday, September 23, 1999 5:04 PM
To: WJohnson@tormet.com
Subject: Re: SUSMP Comment

Wendall

Thanks for the comments. I'll include it for consideration.

Thanks

From: Johnson Wendell <WJohnson@tormet.com>
To: "'xswami@rb4.swrcb.ca.gov'" <xswami@rb4.swrcb.ca.g...
Date: 10/21/99 11:37AM
Subject: SUSMP

The City of Santa Monica has a Storm Water Mitigation Plan in place. Santa Monica requires Developers to submit an Urban Runoff Mitigation Plan as a part of its first stage of planning approval. They require a 20% reduction in total runoff from the site. This plan has been in effect since 1993, would it be useful to have staff from the City of Santa Monica make a presentation on "lesson learn" from their policy? As a part of this SUSMP debate.

Wendell
City of Torrance

CC: "'ddickers@rb4.swrcb.ca.gov'" <ddickers@rb4.swrcb....

Date:

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

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In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Victoria Wikle

Name:
Address:

Victoria Wikle
25053 Mulholland Highway
Calabasas, California 91302

Date: 12/3/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

Name: MARTI WITTER
Address: 643 OLD TOPANGA CYN
TOPANGA CA 90290

R0069779

Dear Mr. Dickerson,

I am writing in support of the proposed requirement for retaining stormwater on-site at new development and redevelopment projects in L.A. county.

This proposal could have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters.

Please help protect L.A. county's aquatic life and all of us who enjoy and love it's beaches.

Sincerely,

Clea Wright

DEAR EXEC. DIRECTOR DICKERSON, JAN. 1, 2000

I SUPPORT THE PROPOSED REQUIREMENT FOR RETAINING STORMWATER ON-SITE AT NEW DEVELOPMENT & REDEVELOPMENT PROJECTS IN L.A. COUNTY. YOUR STAFF RECOMMENDS SUCH PROJECTS BE DESIGNED TO RETAIN RAINFALL OF UP TO 0.75 INCHES DAILY. THIS IS A GOOD IDEA. H_2O COULD PERCOLATE INTO GROUND, OR BE TREATED & DRAINED. THIS WILL REDUCE POLLUTED RUN-OFF.

Jim Yarbrough (Address on reverse)

R0069781

RECEIVED
1999 DEC 20 P 1:49

Ryan Young
28028 Marguerite Pkwy #0
Mission Viejo, CA 92692

December 16, 1999

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

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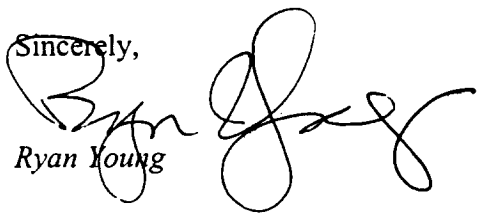
R0069782

Sincerely,



Ryan Young

R0069783

2046 14th St. #11
Santa Monica, CA 90405

RECEIVED
DEC 10 1999
BY:.....

December 6, 1999

Regional Water Quality Control Broard
ATTN: Dennis Dickerson, Executive Officer
320 W. 4th Street,
Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

I am a frequent user of the beaches of Southern California and I am very concerned about the water quality of the local beaches. I support the numeric performance standard to reduce runoff pollution. I understand that the Natural Resources Defense Council (NRDC), the Los Angeles County Department of Public Works, and Heal the Bay supports tougher standards to prevent much of the harm done by stormwater runoff and pollution. I believe this a good start in the efforts to stem the tidal wave of increasing runoff.

Sincerely,

Randall L. Ziglar

January 18, 2000

RECEIVED

2001 JAN 20 P 2:02

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I wanted you to know that after five years of research, the Los Angeles based environmental organization TreePeople has demonstrated the benefits and feasibility of capturing rainwater and recycling it. TreePeople brought together leading experts to develop best management practices, and then showed how easily they could be implemented.

Now, you have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

We've shown that it is feasible. Now it is up to you to ensure that it actually happens.

Thank you for your consideration.

Sincerely,



11-320

R0069785

Date: 11/11/99

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

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Sincerely,

Name:
Address:
1248 Barrington Ave #3
LA CA 90025

R0069786

Dear Mr. Dickerson: 12-26-89

This urges your and the Board's support for the proposed rules to require new and re-developments to trap rainwater up to 0.75 inches/24 hr. Good for groundwater recharge, good for beach & ocean pollution, rivers & streams.

Thank you

Dan Acosta

R0069787

Wrigley Association

P.O. Box 16192, Long Beach, California 90806

- Define increased potential for downstream erosion as discharges from hillside properties and discharges to riparian, wetland, and estuarine habitats
- Consider the synergistic impact of pollutants
- Account for incremental increases of pollutants of concern over time as population grows
- Establish an additional SUSMP for development that may impact Environmentally Sensitive Areas
- Incorporate mitigation of runoff from parking lots as a separate requirement in every BMP with the exception of single hillside residences
- Include wildlife corridors in the section related to "Conservation of Natural Areas" in the SUSMPs
- Delete phrase "if applicable" from section titled "Protect Slopes and Channels" and define the term "slope"
- Add wording that encourages use of natural drainage systems when possible, prohibits use of concrete channels without adequate mitigation, and to the extent possible eliminates or reduces runoff to unlined channels
- Ensure that a minimum standard is set for determining the point at which costs exceed benefits threshold is set to be certain that less environmentally progressive municipalities are not given a loophole to avoid applicability of the SUSMPs in their jurisdiction
- Reinsert the requirements to minimize the amount of stormwater directed to impermeable areas, maximize the percentage of permeable surface, and reduce stormwater load to the maximum extent practicable in each SUSMPs
- Require that in all SUSMPs, except those for hillside residences, 25% of landscaped areas be xeriscape
- Avoid use of energy dissipaters that would impinge on existing habitat
- Prohibit certain unacceptable connections to the MS-4 as described by Heal The Bay
- Recommend BMP maintenance guidelines in the model program
- Review local ordinances, or adopt the current definitions for setting minimum standards for natural slopes and height of cut or fill slopes
- Apply requirements for gasoline outlets to all retail development that will include a fuel dispenser especially car wash operations with fueling dispensers and marinas, which may not even have pumps with automatic shut-off valves

Thank you for the opportunity to comment on the August 11, 1999 draft of the SUSMPs. If you would like to discuss Wrigley's position on SUSMPs, please call our environmental chair Joan Greenwood at 562-599-0812.

Very truly yours,

Jill Hill

Jill Hill,
President

AbTech INDUSTRIES

January 13, 2000

2000 JAN 14 A 9:47

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Re: Runoff Standard for new and redevelopments. AbTech Ultra-Urban™ Filter – Effectiveness of Storm drain inserts.

Dear Mr. Dickerson

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R0069789

4110 N. Scottsdale Rd., Suite 235, Scottsdale, AZ 85251 602•874•4000 800•545•8999 fax: 602•970•1665 email: info@oars97.com www.oars97.com

AbTech is a corporation that manufactures Ultra Urban Filters which contain the OARS Smart Sponge technology. This stormdrain insert is designed to absorb, adsorb and chemically bond hydrocarbons in the typical stormwater runoff as it runs through the filter. The design of the Ultra Urban Filter is such that the box itself also collects trash, debris, sediment and other solid waste (which carry with it various other contaminants such as heavy metals) that would otherwise enter the storm system. This passive system, installed at the curb inlets, is a low cost effective solution to the problem. Costs range from $500-$1500 per storm drain, and the effectiveness has ranged from 70% to 99% in tests for hydrocarbon removal. We at AbTech firmly believe that the benefits of this rulemaking far outweigh the costs.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,
AbTech Industries Inc.



David Zarider
Vice President Sales and Operations
Resident of Los Angeles

AIR LIQUIDE

December 23, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

RECEIVED
2000 JAN 21 P 1:18
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000 I urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopment capture, treat, or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted. I walk on the beach often and on occasion find it embarrassing to observe so much trash and pollution on the beach and in the surf. It should be unacceptable for such a great city to allow this to occur at one of its prized natural resources.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers, and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Imagine having relatives or friends visit and then going to the beach for the day only to find posted signs warning persons to stay out of the water and trash and debris littering the beach. For me, this is what is riding on this proposal.

Sincerely,

Karl Bruskotter
Santa Monica, CA

RECEIVED
2000 DEC 27 P 1:42
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION



ENTERTAINMENT MARKETING

November 30, 1999

Mr. Dennis Dickerson
LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

Los Angeles stands at a critical juncture in its environmental history. On January 6, 2000, we urge you to adopt the reasonable proposal set forth by your own staff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three-quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

We have been brought to this crossroads by extensive development that completely disregards the quality and quantity of runoff generated. The Los Angeles Region already suffers from some of the worst water quality in the nation. Today, approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach...[that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problems. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of aquatic life, for the health of the 60 million people who visit Los Angeles county beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Nancy M. Akers

Nancy M. Akers

NMA:ms

R0069792

10430 Scenario Lane · Los Angeles, CA 90077 · (310) 474-1224 / (310) 474-4556 Fax
E-mail: owear@earthlink.net

January 24, 2000

ANN ROMANO
ASSOCIATES
COMMUNICATIONS STRATEGIES
PUBLIC RELATIONS

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Ann Romano
Principal

R0069793

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

34611 Camino Capistrano ▲ Capistrano Beach, California 92624 ▲ (949) 496 1076 ▲ (949) 496 0941 FAX

11-368

APARTMENT ASSOCIATION
CALIFORNIA SOUTHERN CITIES, INC.

4120 Atlantic Avenue, Long Beach, California 90807-2910
(562) 426-8341 or (800) 310-2080 • FAX (562) 424-3764
Web site: http://www.apt-assoc.com • Email: info@apt-assoc.com

September 16, 1999

Mr. Dennis A Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

On behalf of the Board of Directors of the Apartment Association, California Southern Cities and our 3,000 members, I am writing to request that you postpone taking any action today at the Regional Board Meeting that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place. Additionally, it is my understanding that there has not even been a study done to determine whether or not the proposed process will work in the short distance allowed on most development sites.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Nancy Abbede
Executive Director

R0069794

cc: Mr. Hashid Nabai, Chair
California Regional Water Quality Control Board, Los Angeles Region

The voice of the rental housing industry for 75 years

ASCE -Los Angeles Section
Urban Planning & Development Group
Urban Transportation Group

December 28, 1999

Mr. Dennis A. Dickerson
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: Revisions to Standard Urban Stormwater Mitigation Plans (SUSMPs)

Dear Mr. Dickerson:

The Los Angeles Section of the Urban Planning and Development Group of the American Society of Civil Engineers is a group of professional engineers which focuses on current issues and projects within the Los Angeles area. We are extremely concerned with several of the recent proposed modifications of the model programs as they are not based on sound engineering judgement, and have been improperly extracted from sources which were not prepared for the purposes they are being used.

NUMERICAL LIMITS

We have been contacted by several groups regarding their concerns with the basis for and the application of numerical limits. In particular, we are concerned with the validity of using a volumetric standard for the design of Best Management Practices (BMPs) which are based on treating a certain flow rate. The ASCE/WEF manual has been used as a standard for this design, but this method is for a combination of detention and treatment, not for the sizing of individual BMPs.

Most of the structural BMPs which are currently in use are sized by using a flow rate. The volume could theoretically occur over a 24-hour period, or a much shorter period similar to a storm used for hydraulic sizing of drainage conveyance devices. The inverse ratio of the design flow rates calculated by these two methods would be identical to the length of the design storms. For example, a typical design storm used for drainage conveyance sizing could be around twelve (12) minutes for a site of this size. The ratio between the design flow rate the 24-hour storm versus this shorter storm would be 1440/12 = 120. This means that the ratio of the flow rates would also be a factor of 120.

Also, the County of Los Angeles has prepared a hydrology manual which is the standard for engineers within the County to determine flow rates for sizing storm drainage

structures. The hydrology of different areas of Los Angeles County varies significantly, and can be seen in the Hydrologic Maps in the County manual. The County maps indicate the 50-year maximum 24-hour rainfall with contours superimposed on USGS maps. The values range from 5 inches within a 24-hour period to 18 inches within a 24-hour period. In fact, the rainfall varies up to 7 inches within a 24-hour period with 3 miles (Palos Verdes Figure C1.14).

There is insufficient information regarding levels of relevant pollutants in receiving waters to justify the Treatment Control BMPs dictated by the numerical standards. There are no studies that indicate which pollutants of concern are above acceptable levels in the receiving waters.

There is insufficient stormwater monitoring data available to demonstrate that the types of activities regulated by the numerical standards are actually causing a negative impact to the receiving water. We may incorrectly be placing BMPs in locations where they will have no impact on storm runoff or on the reduction of target pollutants.

An in-depth analysis has not been performed regarding the effectiveness of the approved BMPs that provide criteria for the selection of BMPs to achieve the numerical standards being recommended. If we are required to treat a certain amount of water flowing from the site, we need to choose BMPs which effectively treat the flow rate due to the design storm. There needs to be criteria for calculating contact time, settling rates, and other deisgn parameters that are not known at this time.

ENVIRONMENTALLY SENSITIVE AREAS

One additional category added to the SUSMPs is Environmentally Sensitive Areas (ESAs), meaning that projects located adjacent to or discharging to an environmentally sensitive area would need to conform to a SUSMP. One of the definitions of an ESA is an area designated as a Significant Natural Area by the California Resources Agency. The California Department of Fish and Game (DFG) is the agency in charge of locating the SNAs.

We have investigated the theory behind and the current limits of the SNAs. The theory behind the SNAs was to identify natural areas to promote local educational awareness. The areas are very general, and were not created for any type of regulatory application. A radius of up to one mile was created around locations where natural vegetation or wildlife is located and identified in the Natural Diversity Database. The use of the SNAs to identify projects needing SUSMPs is not a misapplication of the DFG's information.

We have also investigated the limits of and the implications of using the SNAs as an ESA. The SNAs cover much of Los Angeles County, including the outlets of Malibu Creek, Ballona Creek, and the San Gabriel River. We feel that this is not the intent of the SUSMPs, and subjects virtually all projects draining to any of these channels to the SUSMPs.

HILLSIDE DEFINITION

The modification of the definition of a hillside to any project in which there is any grading. We suggest that the original definition be used, which is a project where the existing ground is over a 25% slope.

CONCLUSION

We strongly suggest that these proposed revisions to the SUSMPs be eliminated to reflect the approach originally put forth by the local cities and the County of Los Angeles. If revisions are still needed, they should be based on proper engineering design, and not to simply satisfy the concerns of environmental groups. We would be happy to be a part of any effort to reach a sound solution.

Sincerely,

Allan Rigg, P.E.
Vice Chairman, Los Angeles Section ASCE Urban Planning and Development Group

B & E ENGINEERS

CIVIL ENGINEERING SURVEYING LAND PLANNING

24 W. ST. JOSEPH STREET
ARCADIA, CA 91007

TEL 626-446-4449
FAX 626-446-6566

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Via Fax #: 213-576-6640
(4 pages)

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000. The hearing is on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054).

As a Southern California Professional Civil Engineer and a Principal in a Civil Engineering Firm of Land Development Projects, I support the goals of clean water. However, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements.

These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

As mentioned above, I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders.

This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask

that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

B & E Engineers

Ramy F. Awad

Ramy F. Awad, P.E.
Vice President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

Building Industry Association of Southern California

1330 South Valley Vista Drive
Diamond Bar, California 91765
909.396.9993
fax 909.396.9846
http://www.biasc.org

January 25, 2000

Chairman H. David Nahai
and Members of the Board
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Dear Chairman Nahai and Members of the Board:

On behalf of the Building Industry Association of Southern California (BIA/SC), I must express strong concern with the way the SUSMP issue has been handled by Board Staff. The lack of a set process for addressing this very important issue, coupled with last minute and seemingly arbitrary changes in the facts involved with this hearing, concern our industry greatly and leave us with a sense of "foul play." What is most disturbing is that the handling of this issue to date has most certainly limited informed public access to the decision making process.

Specific Concerns

As you will recall, at your September 16th Hearing on SUSMP several individuals noted for the Board their concerns over a lack of proper notification and other problems with how the issue had been handled. Also, our industry and others raised specific concerns over, what appeared to be, favorable treatment to the environmental community as to the rules governing their testimony and presentation to the Board.

Since the September hearing things have not gotten better and in fact have gotten even worse. Several specific actions by Board Staff continue to concern us. First of all, the meeting location for the hearing was changed late Friday afternoon, long after we (and other organizations) had already sent out numerous notices asking our members to attend and giving them the original meeting location.

Second, in a memo from Xavier Swamikannu of Board Staff dated December 17, 1999, we were told to coordinate all of the individuals speaking on behalf of our industry into one comprehensive presentation on SUSMPs. We were specifically asked to give Board staff a list of the individuals that would be speaking and the amount of time required. After complying with this request and believing that this is how the hearing would be handled, we were told just last Friday afternoon (only 3 business days before the hearing) that the hearing would be handled in a completely different fashion. We now learn that we will have only three minutes per individual and no opportunity for a comprehensive presentation from our

An Affiliate of the National Association of Home Builders and the California Building Industry Association

Antelope Valley Chapter
Baldy View Chapter
Desert Chapter
Greater L.A. / Ventura Chapter
Imperial Valley Chapter
Los Angeles County East Chapter
Orange County Chapter
Riverside County Chapter

industry. We are concerned, not only over the late nature of this change in plans, but also over the fact that the procedure the Board is now planning to use is in no way sufficient to cohesively convey our industry's concerns, especially considering the highly technical nature of some of our issues.

Third, we are concerned that we were given a December Draft of the SUSMP proposal to comment on. Then in the January 18th staff report we were told that a "Change Sheet" would be issued later which would make changes to the Draft SUSMP document. After regular business hours last Friday, a very hard to follow list of changes (Change Sheet) was sent out from the Board Staff. Most people did not even receive this document until Monday morning, just two days before the hearing. Even after reviewing the Change Sheet it is difficult to understand what is the exact language being proposed in the revised SUSMP that will be before the Board on Wednesday.

To give Board Staff insight into our industry's position and to gain clarification on a number of issues within the Change Sheet, we met with your Executive Officer, Dennis Dickerson yesterday. While we appreciate Mr. Dickerson's time, there were several questions that he could not answer regarding what the final language submitted to the Board would include. He referred us to Xavier Swamikannu of the Board Staff as the person writing the final language and the individual that could answer our questions. We asked to talk with Mr. Swamikannu yesterday but he was in San Diego at a meeting. This morning (Tuesday) we finally did reach Mr. Swamikannu at the Board Office and after reviewing with him the questions which Mr. Dickerson could not answer, we were still unable to confirm what would be in the specific language in the final SUSMP proposal before the Board. He further informed us that an additional Change Sheet would be issued later today or tomorrow morning before the hearing.

Our concern here is that once again the Board Staff has engaged in last minute changes that will make it difficult for our industry and all other concerned parties to provide truly informed testimony during tomorrow's hearing. The "ever-changing" nature of the staff's proposal has limited informed public access to the process and has created an environment that is not conducive to the formation of sound public policy.

Finally, after meeting with Mr. Dickerson yesterday we asked Board Staff for a copy of the full comment binder that was sent to you as Board Members. Staff was kind enough to provide us a copy, however, after we went through the binder we could not locate the January 12, 2000 request letter or the January 14, 2000 comment letter submitted to the Board by BIA/SC. Also missing from the binder was a January 14, 2000 comment letter from one of our BIA members. When we pressed Board Staff for a reason why these letter were not included we were told that Mr. Dickerson had chosen which letters went into the binder and which did not. Board Staff assured us that all letters, even those not included in the binder, were eventually sent out to the

Board Members through supplemental packages. When we asked if they had copies of the supplemental letters that had been sent or if they could just verify for us that our letters were indeed sent to the Board Members, they could not. They also could not locate the file which contains all of the original comment letters received by the Board on the SUSMP issue because Mr. Swamikannu had taken the file with him to San Diego. (This struck us as a risky policy for original documents which are part of the public record.) Since Board Staff could not confirm that our January 14, 2000 comment letter ever got to you, the voting Board Members, they did agree to send it out in yesterday's supplemental package.

This incident causes us great concern, both because we wonder what other information may not have made it to Board Members and also because of the arbitrary approach that Board Staff has used in determining what was included in your binder. For example, your binder included two old letters from our association, but not the most relevant one, our January 14th comment letter. Also, while our letter somehow didn't make the comment binder, Board Staff took the time to send all Board Members an additional binder completely dedicated to the NRDC position paper and support material. Lacking a consistent process, the staff's actions appear arbitrary and unfair.

Summary of Concerns

Taken together – and within three business days before the hearing – the Board has changed meeting locations, changed the way we will be allowed to address the Board during the hearing, and (up to the last minute) has changed the actual language of the policy being considered at the Hearing. This is hardly a professional way to do business. Further, it is hard to argue that these activities invite informed participation from the public and concerned organizations.

Please also consider that those of us wishing to address you, the Board Members, are not allowed to do so independently because of your ex parte communication policy. This means that our only opportunity to address you directly on this important issue will occur during Wednesday's hearing. This makes these proceedings extremely important to us. Yet, we are forced to try to communicate our numerous concerns on complex and technical issues in the context of a three-minute presentation to the Board. If that weren't hard enough, please consider that we have had less than three business days to prepare for this restrictive format and that we have still not even seen the final SUSMP language that will be before the Board. Add to this that we are now forced to question whether you, the Board Members, are receiving all of the valuable information that we and other interested parties are sending to you in advance on this critically important SUSMP issue.

Because of these concerns, our industry strongly objects to the way the SUSMP issue has been handled to date. We are happy to participate in a fair process, but the one that we have been subjected to is not such a process. Further, we believe that you, as Board Members,

need to know that your staff has created an environment that is not conducive to the creation of sound public policy.

Request for Time

One means by which the Board could rectify some of the concerns we have raised is by allowing for an additional half-hour presentation during tomorrow's hearing. The process you have outlined for the hearing includes two 30-minute segments of time, one segment in support of and one segment in opposition to the SUSMP proposal. The Board's memo describing this process states that, "The Board will accept, at the beginning of the meeting, a list of 10 speakers from those in favor and a list of 10 speakers from those in opposition who will use this time." While this sounds fair and impartial, the fact is that Board Staff has allowed David Beckman from NRDC to coordinate the 10 speakers (30 minutes) in support and Desi Alvarez from EAC to coordinate the 10 speakers (30 minutes) in opposition. This means that the Board will hear a 30-minute presentation from the environmental community in support of the SUSMP proposal and a 30-minute presentation from the municipalities (permitees) in opposition to the SUSMP proposal. (It should be noted that the environmental community does not completely support, nor do the municipalities completely oppose what has been presented in the SUSMP proposal.)

What is missing from this plan is a presentation from another very important group – the regulated community. Board Members should have the benefit of hearing a comprehensive presentation from those who will ultimately be asked to implement and comply with the SUSMP proposal. Failure to include the regulated community in the initial presentations is tantamount to receiving only part of the story.

With this in mind, the Building Industry Association of Southern California requests that the Board amend the procedure for public comment to include a third 30-minute presentation from the regulated community. We hope that your desire for an informative and inclusive public hearing on the SUSMP proposal will justify this request

Thank you for your attention in this important matter and for your consideration of our request.

Sincerely,

Richard J. Lambros
Executive Vice President

cc: Dennis Dickerson, Executive Officer

Building Industry Association of Southern California

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Diamond Bar, California 91765
909.396.9993
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http://www.biasc.org

January 21, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

On behalf of the 1,850 members of the Building Industry Association of Southern California (BIA/SC), I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from stormwater run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Boards efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams, wetlands, bays and the ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that has made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definition for "Hillsides," "Parking Lots," and "Environmental Sensitive Areas" have been dramatically changed since the September 16, 1999 Board hearing. These new definitions have not been discussed yet in a public hearing or with the regulated communities.

R0069804

11- ~~339~~ 382

Antelope Valley Chapter
Boldy View Chapter
Desert Chapter
Greater LA./Ventura Chapter
Imperial Valley Chapter
Los Angeles County East Chapter
Orange County Chapter
Riverside County Chapter

Definition of Hillsides

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, we suggest that the Board to modify the definition as property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county).

Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input for the municipalities, the regulated communities or interested parties. It is unclear why and how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not Parking lots that are not associated with small commercial developments.

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose

benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Richard J. Lambros
Executive Vice President

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

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THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with **all** of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

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Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

BIA Proposal

STANDARD URBAN STORM WATER MITIGATION PLAN

DEVELOPMENT PLANNING

CHANGE SHEET

Summary

The Change Sheet lists proposed changes to the Final Tentative - Standard Urban Storm Water Mitigation Plan, (December 7, 1999). In general, the proposed changes respond to commenters' suggestions on improving clarity, format, and implementability of the Standard Urban Storm Water Mitigation Plan.

NEW

Implementation of SUSMP on the Development Process

1. We would like to request that any new policies which are adopted by the Board become effective only on projects which have not received Tentative Map approval from the governing agency.

CLARIFICATION

Waiver

- alternative fee } ask board to consider max % of cost

1. All waivers should be capped at some reasonable amount for costs. (It should not be open-ended).

to a city 180 days

* Only projects submitted after adoption of ~~of~~ SUSMPs should be covered

- approved by city
- or submitted date?

120 days after LARWQCB approval

BIA proposed language re Strike's out P9. Numerical

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

Staff Report

End to last PP re: the state construction permit.

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit, which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

Discretionary projects, that fall into one of seven categories are identified in the NPDES Permit

as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units*

* (Note: this category is two separate categories in the NPDES Permit)

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements. These categories are:

Location adjacent to or discharging to an environmentally sensitive area, and
Parking lot 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

DEFINITIONS

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"100,000 Square Foot Commercial Development" means Developments based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

"Retail Gasoline Outlet" means a facility primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" means property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county). ~~property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope and where grading contemplates cut or fill slopes~~ .

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

"Restaurant" means a facility that sells prepared foods and drinks for consumption, including



stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

"Parking Lot" means commercial "stand alone" parking lots, and not Parking lots that are associated with small commercial developments.
~~land area or facility for the parking of commercial or business or private motor vehicles.~~

"Environmentally Sensitive Area" means ~~an area designated as an Area of Special Biological Significance by the State Water Resources Control Board or an area designated as a Significant Natural Area by the California Resources Agency or~~ an area designated as an area of Ecological Significance by the County of Los Angeles.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures,, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both treatment control BMPs and source control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Infiltration" means the downward entry of water into the surface of the soil.

"Directly Connected Impervious Area (DCIA)" means the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

Redevelopment" means, on an already developed site, the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure;

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structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces .

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes , (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMPs contained herein to be consistent with the code, except where those practices would defeat or circumvent the intent of the SUSMP requirements.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate may result in a foreseeable increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The

development must be designed so as to minimize, to the maximum extent practicable , the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* , USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question..

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

If applicable, project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of

improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.
Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.
Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following *structural BMP* requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, treatment control BMPs in project plans, the Permittee shall require

that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, this verification will include the developer's signed statement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any treatment control BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the treatment control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If treatment control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Treatment control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

~~**9. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS**~~

~~Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.~~

~~a. Post-construction Treatment Control BMPs shall be designed to:~~

~~A. mitigate (infiltrate or treat) storm water runoff from either:~~

~~1. each runoff event up to and including the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or~~

~~2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook - Industrial/ Commercial*, (1993), or~~

~~3. the volume of runoff produced from each and every storm event up to and including 0.75 inch of rainfall, prior to its discharge to a storm water conveyance system, or~~

~~4. the volume of runoff produced from each and every storm event up to and including a historical record~~

~~based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,~~

~~AND~~

~~B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.~~

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a. the roofing materials will not be a source of pollutants of concern in storm water, and

b. storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c. roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly or indirectly discharge to a natural stream or unlined channel or channel segment scheduled for restoration.

Exclusions

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the requirements of this Section.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant

and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

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3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that deposit on these surfaces from motor vehicle traffic. These pollutants are directly transported to surface waters.

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

clarify

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code inc incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. Recognized situations of impracticability include (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because an underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately approved by the Regional Board Executive Officer before it becomes recognized and effective. A waiver granted to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPS

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

A Permittee may elect to accept a signed certification that the plan meets the criteria established herein and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria, in lieu of conducting detailed BMP review to verify treatment control BMP adequacy. The training must have been conducted by an organization with storm

water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, or the California Water Environment Association) with the training and curriculum accepted by the Regional Board Executive Officer. For the certification to be valid, training must have been received not more than two years prior to the signature date on the plan.

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310

California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988 Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs.	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847

Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

R0069825

TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended/dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil/Water separators
- Catch basin inserts
- Continuous flow deflection/ separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

R0069826

VIA FACSIMILE

January 14, 2000

Mr. Dennis Dickerson, Executive Director
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Building Industry Comments on the Standard Urban Stormwater Mitigation Plan (SUSMP)

Dear Mr. Dickerson:

On behalf of the 1,850 members of the Building Industry Association of Southern California, we would like to reiterate our concerns expressed to you in our September 1999 letter and our September 16, 1999 presentation before your Board on the SUSMP issue.

While our industry continues to support the goals of clean water, we remain opposed to the plan as written. The inclusion of a numerical mitigation standard whose benefits have not been proven and whose cost effectiveness has not been studied makes it impossible for us to support the December 7, 1999 staff proposal.

Let us be clear that the building industry is committed to the goal of cleaning our stormwater run off. Further, our industry is committed to participating in a process that truly seeks to achieve this goal. Such a process should include the testing and study of various best management practices with a focus on pilot programs which have proven to be effective. This process should involve all affected parties (the regulated community, the municipalities and the environmental community) and should be based on sound science.

Because the December 7, 1999 proposal does not provide for any of the process outlined above, we sincerely doubt that it will achieve its stated objective. As the industry principally impacted by this proposal, we would like to be part of a process that has a chance of actual, measured, scientifically proven success.

We respectfully request that you and the Board reject the concept of a numerical mitigation standard. We look forward to making a thorough presentation outlining all of our thoughts and concerns on these issues during your January 26, 2000 public hearing.

Sincerely,

Richard J. Lambros
Executive Vice President

1-338381

R0069827

BIA
Building Industry Association of Southern California
1330 South Valley Vista Drive
Diamond Bar, California 91765
909.396.9993
fax 909.396.9846
http://www.biasc.org

Antelope Valley Chapter
Baldy View Chapter
Desert Chapter
Greater L.A. Ventura Chapter
Imperial Valley Chapter
Los Angeles County East Chapter
Orange County Chapter
Riverside County Chapter

BIA of Southern California, Inc.
1330 South Valley Vista Drive
Diamond Bar, CA 91711
(909) 396-9993
(909) 396-1571 Fax

[redacted]

To:	Mr. Dennis Dickerson	**Fax:**	213-576-6625
From:	Mr. Richard J. Lambros	**Date:**	January 13, 2000
Re:	SUSMP Hearing	**Pages:**	3 (including cover page)
CC:	Dr. Xavier Swamikannu		

☐ Urgent X For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycl

Dear Mr. Dickerson —

Please see the attached letter on our request for a comprehensive presentation by the Building Industry during the January 26, 2000 Standard Urban Storm Water Mitigation Plan (SUSMP) Hearing.

I look forward to hearing from you on our request for a comprehensive presentation for the SUSMP hearing. Should you need to contact me personally, please do not hesitate to do so.

Thank you.

R0069828

[redacted]

Building Industry Association of Southern California

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Diamond Bar, California 91765
909.396.9993
fax 909.396.9846
http://www.biasc.org

VIA FACSIMILE

January 12, 2000

Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Request for Comprehensive Presentation by the Building Industry during the January 26, 2000 Standard Urban Storm Water Mitigation Plan (SUSMP) Hearing

Dear Mr. Dickerson:

On behalf of the 1,850 members of the Building Industry Association of Southern California (BIA/SC), we are requesting the opportunity for our industry to provide a comprehensive presentation during the upcoming hearing on the proposed Standard Urban Storm Water Mitigation Plan (SUSMP).

Per your request, we have met with our members and have consolidated our industry's numerous issues and concerns into one comprehensive presentation. This presentation will cover a variety of topics as outlined below:

INDUSTRY TOPICS AND SPEAKERS

- Overview of Industry Concerns, Home Builder *(to be determined)*
- Response to Environmental Concerns, Ray Pearl, Deputy Director of Government Affairs, BIA – Greater Los Angeles\Ventura Chapter
- Legal Review, Tom Morrison, General Counsel, BIA/SC
- Research & Cost Analysis, Richard Watson, RWA & Associates
- Our "Clean Water Solution," Richard Lambros, Executive Vice President, BIA/SC

In order to provide each speaker with enough time to cover our industry's concerns, we are requesting that you allow each speaker five (5) minutes. Therefore, we estimate our total presentation will last approximately 25 minutes.

Lastly, our industry is in the process of reviewing and developing our final comments on the revised SUSMP, as amended and released on December 7, 1999. Once we finalize our comments, we will forward them to you and the Board.

R0069829

I look forward to hearing from you on our request for a comprehensive presentation for the SUSMP hearing scheduled on January 26, 2000. Should you need to contact me personally, please do not hesitate to do so.

Sincerely,

Richard J. Lambros
Executive Vice President

cc: Dr. Xavier Swamikannu

RECEIVED
1999 DEC 27 P 1:41
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Building Industry Association of Southern California

1333 South Valley Vista Drive
Diamond Bar, California 91765
909 [illegible]9993
fax 909.396.9846
http://www.biasc.org

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2000 JAN 27 P 1:20
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

VIA FACSIMILE

December 23, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan and Related Materials

Dear Mr. Dickerson:

On behalf of the Building Industry Association of Southern California (BIA/SC), we want to thank you for changing the Standard Urban Storm Water Mitigation Plan (SUSMP) hearing from January 6, 2000 to January 26, 2000. The earlier date did not allow for proper review and comment given holiday and vacation schedules during this season of the year. Now, we will have a chance to more fully consult our members and prepare for the hearing. We will ask our members to support group presentations in order to help you structure the hearing to provide your Board members with information necessary to make an informed decision.

In reviewing the response to comments from the September 16, 1999 Regional Board Hearing, I have noted two items that we would like to review as soon as possible. One is the preliminary costing estimates cited in your response to comment number 34. The response claims that preliminary costing estimates indicate that the costs related to the numerical mitigation measure "are reasonable." We request that you provide us with all of your costing estimates so that we may understand the basis of your claim.

The second item is the Record of Decision (ROD) referenced in the Summary of Comments Received and Response. We are directed to the Record of Decision and to references in the ROD. However, the document was not provided with the material you distributed on December 7, 1999. We need to review this document in order to understand the responses to comments.

R0069831

Antelope Valley Chapter
Baldy View Chapter
Desert Chapter
Greater L.A.-Ventura Chapter
Imperial Valley Chapter
Los Angeles County East Chapter
Orange County Chapter
Riverside County Chapter

We need to review the costing estimates and the Record of Decision as soon as possible so that we may be prepared to answer questions from our members. Therefore, we would appreciate receiving the documents early next week. If necessary, we can have them picked up at your office. Please call me to confirm when we may expect the documents.

Once again, thank you for your assistance on this matter.

Sincerely,

Charles Gale

Charles Gale
Director of Government Affairs

cc: Dr. Xavier Swammikannu

Building Industry Association of Southern California

1330 South Valley Vista Drive
Diamond Bar, California 91765
909.396.9993
fax 909.396.9846
http://www.biasc.org

VIA FACSIMILE

December 23, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan and Related Materials

Dear Mr. Dickerson:

On behalf of the Building Industry Association of Southern California (BIA/SC), we want to thank you for changing the Standard Urban Storm Water Mitigation Plan (SUSMP) hearing from January 6, 2000 to January 26, 2000. The earlier date did not allow for proper review and comment given holiday and vacation schedules during this season of the year. Now, we will have a chance to more fully consult our members and prepare for the hearing. We will ask our members to support group presentations in order to help you structure the hearing to provide your Board members with information necessary to make an informed decision.

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R0069833

Antelope Valley Chapter
East Valley Chapter
Desert Chapter
Greater [illegible] Chapter
Inland Valleys Chapter
Los Angeles County East Chapter
Orange County Chapter
Riverside County Chapter

12/23/99 THU 17:03 FAX 9093961571 BIA OF SO CALIF 002

We need to review the costing estimates and the Record of Decision as soon as possible so that we may be prepared to answer questions from our members. Therefore, we would appreciate receiving the documents early next week. If necessary, we can have them picked up at your office. Please call me to confirm when we may expect the documents.

Once again, thank you for your assistance on this matter.

Sincerely,

Charles Gale

Charles Gale
Director of Government Affairs

cc: Dr. Xavier Swammikannu

R0069834

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1999 DEC 16 P 1:54

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

Building
Industry
Association
of Southern
California

1330 South Valley Vista Drive
Diamond Bar, California 91765
909.396.9993
fax 909.396.9846
http://www.biasc.org

December 13, 1999

Mr. Dennis Dickerson
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Time Extension for Special Board Meeting on Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

The Building Industry Association of Southern California (BIA/SC) has received the revised Standard Urban Storm Water Mitigation Plan (SUSMP) and Supporting Regional Board Resolution. We have several concerns relating to the revised SUSMP and proposed January 6, 2000 Special Board Meeting.

As you know, the revised SUSMP was released to the public on December 7, 1999. You requested in your public notice that we respond to your office by December 20, 1999 on the amount of time needed for our industry to comment and to identify our lead speaker. Our members are very concerned, however, that there is not enough time before the upcoming holidays to fully review, analyze, and comment on the proposed revisions to the SUSMP in order to meet your deadline. Therefore, we are requesting that you extend the comment period and move the Special Board Meeting on the adoption of the SUSMP to no earlier than January 26, 2000.

Lastly, we would like to meet with you and your staff on the revisions to the SUSMP. Of particular concern are the revised definition for Hillside Development and the new definition for environmentally sensitive areas.

Once again, our members are very concerned about the revised SUSMP and their impacts on our industry. We look forward to hearing from you in the near future.

Sincerely,

Charles H. Gale
Director of Government Affairs

R0069835

Antelope Valley Chapter
Baldy View Chapter
Desert Chapter
Greater L.A./Ventura Chapter
Imperial Valley Chapter
Los Angeles County East Chapter
Orange County Chapter
Riverside County Chapter

September 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Building Industry Association of Southern California

1330 South Valley Vista Drive
Diamond Bar, California 91765
909.396.9993
fax 909.396.9846
http://www.biasc.org

Dear Mr. Dickerson:

Thank you for your September 13, 1999 response to my September 8, 1999 letter voicing my concerns about the lack of proper notification of the informational items for the September 16, 1999 Board Meeting.

As you know, our office did not receive any notification of the items scheduled for hearing at the September 16, 1999 meeting. In addition, after a brief review of the list of individuals that Dr. Swamikannu sent to us as being inclusive of the notified parties, it became clear that we were not the only entity on the list that was not notified of Thursday's agenda. In addition to Charles Gale of BIA/SC in Diamond Bar, at least several others on the list received no notification, including: Richard Watson of R. Watson and Associates in Mission Viejo, Dee Zinke of BIA/SC in Calabasas and Ron Wilkniss of the Western States Petroleum Association in Glendale.

The issue of notification is extremely important to us for the reasons outlined in my September 8, 1999 letter. I will not enumerate all of them again here, but I feel it is important to reiterate one of our major concerns. That concern being the fact that the regulated community has not had sufficient opportunity to participate with the Board and staff in examining the appropriateness and timeliness of the numerical mitigation measures you are currently evaluating for inclusion in the SUSMPs. We believe this places us at a distinct disadvantage compared to those who have had a greater opportunity to provide comments to you. We feel that it is critically important that you, as the individual charged with approving the numerical mitigation standards, receive enough information from the appropriate sources, especially the regulated community, so that you may make a decision regarding the mitigation programs that balances the needs of all those involved. We can best accomplish our shared goal of fostering a healthy environment if we commit to establishing and maintaining open lines of communication and cooperation.

We are eager to participate in this very important issue. Please do not hesitate to contact me if I can be of assistance.

Sincerely,

Richard J. Lambros
Executive Vice President

R0069836

Antelope Valley Chapter
Baldy View Chapter
Desert Chapter
Greater LA./Ventura Chapter
Imperial Valley Chapter
Los Angeles County East Chapter
Orange County Chapter
Riverside County Chapter

Building Industry Association of Southern California

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September 8, 1999

Dr. Xavier Swamikannu
California Regional Water Quality Control Board,
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Re: Standard Urban Storm Water Mitigation Plans

Dear Dr. Swamikannu:

On behalf of the 1,800 members of the Building Industry Association of Southern California (BIA/SC) we appreciate the opportunity to provide comments on the Standard Urban Storm Water Mitigation Plans (SUSMP), submitted to you by the County of Los Angeles on August 11, 1999. The BIA/SC continues to be keenly interested in effective, efficient and equitable implementation of storm water quality programs in Southern California. We and our local chapters have encouraged our members to continually improve their storm water pollution prevention programs, including erosion and sediment control.

BIA/SC commends the County and its co-permittees for the improvements that have been made in the SUSMPs since March, 1997, when we were first invited to comment on the issues to be included in the Model Programs. We continue to support a program which is based on the use of best management practices (BMPs) and is designed to promote consistency throughout the portion of Los Angeles County subject to the requirements of the National Pollutant Discharge Elimination System (NPDES) Municipal Storm Water Permit No. CAS614001 (Order No. 96-054).

On April 22, 1999 the Regional Board approved a list of Best Management Practices for Permittees to work from. The new framework provides for a regional storm water quality program based on general consistency with flexibility to work within local ordinances and respond to particular site conditions. Effective use of this framework was assured by the Board's direction to Permittees to require implementation of the most effective BMPs in their Development Planning and Development Construction programs.

We are concerned, however, with the proposed widespread imposition of new "numerical mitigation measures for BMP design criteria based on the 'mitigation' of smaller storms to capture a large percentage of runoff events, runoff volume and pollutant loads." As part of a Settlement Agreement, the County of Los Angeles

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Imperial Valley Chapter
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Orange County Chapter
Riverside County Chapter

agreed to develop a new storm water program that included such numerical criteria. Now, some members of the environmental community are encouraging the Executive Officer to require numerical design criteria of all co-permittees. We believe this would be premature and inappropriate at this time. As discussed at the August 10, 1999 Los Angeles County Department of Public Works SUSMP workshop, the scientific/technical basis for the selection of numerical design criteria is tenuous at best.

The County's agreement to a numerical design criterion should be considered a pilot study, to determine if it contributes to the maintenance or restoration of beneficial uses in the receiving waters for the storm water discharges mitigated as specified in the County program. Furthermore, the Regional Board staff proposal appears to go far beyond the County's adopted program. The Los Angeles County's 100+ Home Subdivision Urban Storm Water Mitigation Plan specifies that:

> The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event up to and including 0.75 inches of rainfall, prior to it discharging into the storm water conveyance system.

The staff proposal, as summarized in the August 16, 1999 Notice of Public Hearing, confuses the situation by referring to "...capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall. Also, what large percentage of pollutant loads will be captured? By far, the largest percentage of pollutant loads to the receiving waters that have been identified as impaired come from existing development, not new development.

If storm water quality programs are to be successful, they must be focused on potentially significant problems and not just on the easiest targets to regulate. Construction and new development should be regulated, but not over-regulated. Our members want to do their part, but they do not want to waste time and money. We would like to know which particular potential pollutants would be removed by infiltrating or treating the runoff from a specified amount of rainfall. We would also like to see cost-effectiveness evaluations of alternative means of removing the targeted potential pollutants from the storm water discharges on our members' projects.

Lastly, implementation of the storm water program must be guided by common sense and mutual respect. Protecting water quality is important - so is reasonableness. A regulatory program that is perceived by the regulated community as being fair and reasonable will promote greater respect and compliance.

Our Association wants to work with the Regional Board and the Permittees to improve water quality, and we want to do it in a manner that is not disruptive to the regional economy. We are concerned about regulations and policies that are well-intended but not well thought out. We would be pleased to participate with the Regional Board and other interested parties in a structured program to determine what, if any, numerical design criteria would be appropriate for metropolitan Los Angeles.

If you have any questions regarding our comments on this matter, please feel free to call me or Charles Gale, our Director of Government Affairs, at (909) 396-9993.

Sincerely,

Richard J. Lambros
Executive Vice President

BRASH INDUSTRIES

SEP 13 PM 1:5
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

Via Facsimile and Mail Service

September 9, 1999

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th St., Suite 200
Los Angeles, CA 90013

Subject: Proposed Standard Urban Storm Water Mitigation Plans (SUSMPs) for cities in Los Angeles County

Dear Mr. Dickerson:

BRASH Industries (BI)/SoCal GMP manages the State approved storm water group monitoring program comprising more than one hundred auto recyclers in the Los Angeles area. Additionally, BI is the environmental compliance representative for the State of California Auto Dismantlers Association (SCADA) - more than 500 members, and the Auto Dismantlers of Southern California (ADASC)- more than 150 members, and Valley Auto Dismantler and Recyclers (VADRA)-more than 100 members.

"Media Filtration" was noted as a required SUSMP Best Management Practice (BMP) for service stations with more than five repair/work bays or at a specialty service shop, such as lube-shops or tune-up shops.

SoCal GMP, has reviewed numerous storm water run-off laboratory analyses from many auto recycling sites. The data indicates that the storm water contamination levels from the vast majority of the facilities are within LARWB and U.S. EPA Multi-Sector Permit Parameter Benchmark Values, without utilizing treatment technologies. These data establish the fact that pollution prevention is an effective BMP.

Media filtration, a treatment technology, poses numerous issues that appear to be inconsistent with Clean Water Act guidance for cost-effective BMPs/BATs, and application of pollution prevention techniques. The following issues are of concern.

1) Does media filtration require a Department of Toxic Substance and Control (CUPA) permit under Tiered Permitting?

2) Does plugged filter media require handling as a hazardous waste? Is filter media back washing contemplated as part of the BMP process?

3) Does a media filter unit, acting as a treatment tank with 10% of its capacity below grade level, require double containment and leak detection as required for under ground storage tanks (USTs)?

R0069840

P.O. BOX 957 ■ VENICE, CALIFORNIA 90294-0957
TELEPHONE: (310) 305-8637 ■ FAX: (310) 574-0875 ■ brashind@aol.com

4) If media filter effluent is to be returned to the storm drain system and the filter unit is placed below grade level is the use of a float switch activated effluent pump required?

5) Do sand media filters afford sufficient flow velocity through the filter bed to avoid overwhelming the filter during a significant storm event?

6) Is the price estimate provided by the City of Los Angeles of $13,000 realistic? Does it include the cost of pumps, wiring, filter maintenance, regulatory costs, and loss of income from facility area required for the installation of the media filter?

7) Have actual influent flow rate and filter bed fouling rates been utilized in the design guidelines?

8) Has the possibility of pathogenic organisms populating the filter bed material and their attendant health risk been considered?

9) Has the waste streams from auto repair facilities been sufficiently characterized to determine the appropriateness of the media filter to treat the waste stream?

10) Environmental engineering reference books dispute the effectiveness of media filtration for organic materials and material that has not been exposed to coagulation, flocculation, and sedimentation, prior to media filtration:

"Standard Handbook of Hazardous Waste Treatment and Disposal," Harry M. Freeman, McGraw-Hill, 1989 Page 7.4: "Wastes for Which Filtration Will Not Work –Filtration will not remove substances which are dissolved. Waste Streams containing soluble toxic organics, for example, cannot be treated directly by filtration."

"Water and Wastewater Technology," Si Version, 1986, John Wiley & Sons, 1986, page 245, paragraph 7-4 states "FILTRATION–The granular-media gravity filter is the most common type use in water treatment to remove nonsettleable floc remaining after chemical coagulation and sedimentation."

University of Southern California research papers indicate similar findings and also note that oil entrained in filter media significantly compromises a filter's ability to remove settleable floc from the process water.

It is assumed that media filtration is required at automobile service related facilities because of the potential of storm water pollution from on-site inventories of fuel, oil and grease, coolant, suspended solids and heavy metals. We would welcome an opportunity to review case study data supporting the cost effectiveness of media filtration.

One structural BMP, demonstrated to be extremely cost effective in oil and grease removal (sheen) from storm water run-off, are oleophilic socks. This device is not listed as a potential BMP. We recognize that it is difficult to be aware of all the latest technologies, but we strongly encourage the LARWB to consider offering the use of oleophilic sock/booms as a BMP. These devices are provided by a number

R0069841

of manufactures for the express purpose of removing oil and grease from a water body.

ADASC, VADRA, SCADA and BRASH Industries opposes the requirement for the installation of media filtration as a structural BMP for the following reasons:

1) Extensive evidence exists that proves good housekeeping practices and Pollution Prevention measures protect the storm water run-off from pollution resulting from industrial activity.

2) Media filtration is not a cost effective Best Management Practice.

3) Preliminary research has failed to locate studies establishing media filtration as an effective method of removing contaminants resulting from auto repair and service industrial activity. Studies indicating media filter ineffectiveness have been located.

Additionally, oleophilic booms have demonstrated their ability to cost effectively remove oil and grease from storm water run-off, and should be available as a BMP.

After reviewing the foregoing information it is hoped that the RWB will eliminate the requirement for the use of media filtration as a BMP. Moreover, the use of the oleophilic socks should be considered as a recommended BMP. We would be pleased to provide data demonstrating the effectiveness of the oleophilic sock and the ineffectiveness of the media filter.

If we can provide any further information on the foregoing please do not hesitate to contact the undersigned.

Sincerely,

M. H. Sachse

Marvin H. Sachse, P.E.

cc:

D. Bodewitz, ADASC
T. Fiskin, ADASC
J. Gaye, ADASC
G. Gurlekian, VADRA
P. McLafferty, SCADA
H. Marlowe, VADRA

R0069842

CALIFORNIA APARTMENT ASSOCIATION
CALIFORNIA BUILDING INDUSTRY ASSOCIATION
CALIFORNIA BUSINESS PROPERTIES ASSOCIATION
CALIFORNIA CHAMBER OF COMMERCE
CALIFORNIA MANUFACTURERS ASSOCIATION
CALIFORNIA RESTAURANT ASSOCIATION

January 25, 2000

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

SUBJECT: Proposed Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

The above-listed organizations appreciate the opportunity to comment on the December 7, 1999, proposed Standard Urban Storm Water Mitigation Plan (SUSMP). Our respective organizations are very aware of the numerous water quality issues facing California, including the issue of storm water runoff, and support collaborative efforts to address these issues that are based on sound science and take into consideration the most feasible, cost-effective ways of improving water quality.

While the SUSMP is applicable to only the Los Angeles County Municipal Stormwater Permit, we are concerned that certain provisions in the SUSMP that are not based on sound science will set a precedent for future municipal permits on a statewide level and place an enormous fiscal burden on local governments and businesses.

One issue of concern is the establishment of a numeric treatment standard for storm water discharges. We believe that there is a lack of data demonstrating that this new standard is cost effective or that such a standard would actually provide a net benefit to the beneficial uses of receiving waters.

California's water quality issues are extremely complex and will require an assortment of public and private stakeholders to work collaboratively in order to develop equitable solutions that improve water quality while meeting the economic and social needs of a growing state.

Rather than adopt the December 7, 1999, proposed SUSMP that has raised concerns from a wide array of interest, we believe the Board should instead consider a more inclusive approach at addressing this issue such as the Clean Water Initiative approach adopted by the Southern California Association of Governments.

We respectfully request that the Board defer any action on the proposed SUSMP if it includes the numeric treatment standard and does not address issues previously raised by our respective organizations.

Sincerely,

Debra Carlton
California Apartment Association

Valerie Nera
California Chamber of Commerce

Clifford Moriyama
California Building Industry Association

Jeff Sickenger
California Manufacturers Association

Rex Hime
California Business Properties Association

Jot Condie
California Restaurant Association

(NOTE: Authorization was granted to identify each organization and representative)

From: John Claussen <John@cea.sfex.com>
To: "'XSWAMI@rb4.swrcb.ca.gov'" <XSWAMI@rb4.swrcb.ca.gov>
Date: 1/14/00 5:56PM
Subject: California Restaurant Association comments to the SUSMP Rule

Xavier,

I am submitting the following comments to the proposed Standard Urban Storm Water Mitigation Plan (SUSMP) rule on behalf of the California Restaurant Association for the Los Angeles Regional Water Quality Control Board's (Board) consideration.

Please contact me with questions regarding these comments or if you need additional information.

<<011400CRASUSMPcomments.doc>>

Regards,

John D. Claussen
Associate
California Environmental Associates
423 Washington Street, 3rd Floor
San Francisco, CA 94111
415-421-4213
415-982-7989 fax
john@cea.sfex.com
www.ceaconsulting.com

CC: John Claussen <John@cea.sfex.com>, "'Jot Condie'" <jcondie@calrest.org>, "'Allison Whitesides'" <Allisonwhitesides@outback.com>, "'April Young'" <ayoung@fridays.com>, "'Arnie Wensinger'" <awensinger@innout.com>, "'Brian Riendeau'" <Brian.riendeau@tricon-yum.com>, "'Byron Crossen'" <byronc@jps.net>, "'Chris Thomas'" <ChristopherThomas77@marshall.usc.edu>, "'Don White'" <DW282828@aol.com>, "'Ed Conklin'" <ed.conklin@mcd.com>, "'John Howard'" <howardj@dominos.com>, "'Mary Schell'" <Mary_Schell@Wendys.com>, "'Mike Prosio'" <mprosio@sacto.craoffice.org>, "'Peter Casanova'" <peterc@papamurphys.com>, "'Shannon McAleavey'" <smcaleavey@darden.com>, "'Tim Pickwell'" <tim.pickwell@jackinthebox.com>, "'Tony Rolland'" <tbrolland@msn.com>, "'Wayne Lipschitz'" <WLIPSCHITZ@THECHEESECAKEFACTORY.COM>, "'jdery@whopper.com'" <jdery@whopper.com>, "'mkissel@ckr.com'" <mkissel@ckr.com>, "'rburket@whopper.com'" <rburket@whopper.com>, "'lisa.wright@jackinthebox.com'" <lisa.wright@jackinthebox.com>, "'dbldbl@compuserve.com'" <dbldbl@compuserve.com>, "'FPHILLIPS@WHOPPER.COM'" <FPHILLIPS@whopper.com>, "'MHOFFMANN@WHOPPER.COM'" <MHOFFMANN@whopper.com>, "'balexander@whopper.com'" <balexander@whopper.com>, Peter Okurowski <Peter@cea.sfex.com>, "'harrietha1@aol.com'" <harrietha1@aol.com>, "'Paul.Deneka@jackinthebox.com'" <Paul.Deneka@jackinthebox.com>, "'cgale@biasc.org'" <cgale@biasc.org>, Kirk Marckwald <Kirk@cea.sfex.com>

CEA **CALIFORNIA ENVIRONMENTAL ASSOCIATES**

January 14, 2000

Xavier Swamikannu
Storm Water Program
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Re: California Restaurant Association comments on the proposed Standard Urban Storm Water Mitigation Plan Rule

Dear Mr. Swamikannu,

California Environmental Associates (CEA) represents the California Restaurant Association (CRA) and Burger King Corporation (BKC). On behalf of CRA members in Los Angeles County, we submit the following comments on the proposed Standard Urban Storm Water Mitigation Plan for Los Angeles County (SUSMP) to the Los Angeles Regional Water Quality Control Board (Board).

GENERAL

CRA has reviewed the proposed SUSMP rule (December 7, 1999) and has developed comments requesting reconsideration of the numeric treatment standards and offering clarification on specific issues elsewhere in the rule.

CRA is interested in working with the Board, Los Angeles County, the co-permitees (municipalities), and other stakeholders to establish a fair and effective SUSMP rule. The CRA and their member organizations believe that, with the Board's consideration of the changes and clarifications discussed in this letter, the SUSMP rule will accomplish the goals and requirements of the Los Angeles County National Pollution Discharge Elimination System (NPDES) Permit.

CRA's comments address the proposed "SUSMP Provisions Applicable to All Categories" and the specific provisions applicable to priority project categories for "Restaurants" and "Parking Lots".

423 Washington Street, 3rd Floor · San Francisco, CA 94111 Ph: 415/421-4213 · Fax: 415/982-7989

NUMERIC TREATMENT STANDARDS

The Los Angeles County Department of Public Works currently requires, as part of their Storm Water Program[1], monitoring and inspection of existing "food establishments" (including restaurants) for proper implementation and maintenance of various physical and management storm water BMPs. These BMPs are designed to address the following elements of a storm water program at restaurants:

- Spill prevention, control, and cleanup
- Outdoor equipment operations and maintenance
- Outdoor materials storage and handling
- Waste disposal and handling
- Equipment washing and cleaning
- Building and grounds maintenance
- Employee training

When these BMPs are applied, they provide an effective means of preventing the discharge of pollutants to the storm drain system from restaurant operations without the need for numeric treatment standards.

CRA believes that there is a lack of data demonstrating that the required numeric treatment standards are cost effective[2] or that they provide a net benefit to the beneficial uses of receiving waters through their use. Also, while the NPDES Permit calls for mitigation of pollutants from storm water runoff to the "maximum extent practical" it does not go so far as to mandate the use of numerical treatment standards - nor are numerical treatment standards necessary to enforce the implementation of the minimum BMP requirements laid out in the SUSMP rule. CRA requests that the Board defer including the numeric treatment standard in the final SUSMP rule until such time as the Board can demonstrate that implementation of such a standard is feasible, cost effective, and will lead to further reduction of pollutants of concern than already occurs under the current program.

Furthermore, CRA concurs with the position and recommendations of the Southern California Association of Governments (SCAG) outlined in their SUSMP Policy that was approved by the SCAG Regional Council on January 6, 2000, including[3]:

- Not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.
- Monitor pilot programs similar to those underway in Los Angeles County.

[1] A program of the Los Angeles County Department of Public Works (LACDPW), Environmental Programs Division.

[2] The implementation of treatment BMPs will be potentially costly, exceeding the estimated 0.5% of total project costs as estimated by the Board, particularly when retrofitting existing parking lots is considered as part of a "redevelopment" project.

[3] Recommendations cited from the January 6, 2000, SCAG document, *SUSMP Policy Approved by the Regional Council of the Southern California Association of Governments.*

- Ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.

CLARIFICATION

CRA offers the following clarifying comments to the Board for consideration and incorporation into the final SUSMP rule.

Issue 1: Redevelopment
The definition of redevelopment in the proposed SUSMP rule is too vague.

First, CRA requests that the definition of redevelopment clarify the word "remodeling". CRA members are concerned that changes to the interior or décor could trigger the application of this rule. At a minimum, the rule should not be triggered if you don't change the footprint of the building.

Second, CRA requests that a minimum alteration standard of 50% of the size of an existing project be considered for inclusion into the rule. A minimum alteration standard will effectively restrict the requirements of the SUSMP rule redevelopment standard to those projects that are effectively changing the original use and purpose of a facility and substantially increasing the potential for source pollutants of concern being discharged into the storm drain system.

Also, the SUSMP rule defines as one form of redevelopment "replacement of impervious surface that is not part of routine maintenance activity". For parking lots particularly, it is unclear how the distinction between maintenance and "redevelopment" projects will be defined. For instance, will periodic blacktop application of a parking lot be considered "maintenance" or "redevelopment"?

CRA recommends that the Board adopt the interpretation of "maintenance" exclusions defined in the State Construction Permit[4] Fact Sheet. This definition states: "Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility, nor does it include emergency construction activities required to protect public health and safety" (Page 2, State Construction Permit Fact Sheet).

Issue 2: Project Should be Assessed Independently
Restaurant redevelopment projects and parking lot redevelopment projects must be assessed independently.

It is CRA's understanding that redevelopment of an existing restaurant will not trigger the application of the proposed SUSMP rule to an adjacent parking lot, unless the parking lot is "redeveloped" in accordance with the definition provided in the rule. Consequently, the redevelopment of an existing parking lot will not trigger the application of the proposed SUSMP rule to an adjacent restaurant, unless the restaurant is "redeveloped" in accordance with the definition provided in the rule. Please insert language that will clarify that "redevelopment" of a discretionary project will not affect adjacent discretionary projects.

[4] State Water Resources Control Board Water Quality Order 99-08-DWQ, *National Pollutant Discharge Elimination System General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Stormwater Runoff Associated with Construction Activity.*

Issue 3: Maintenance
The SUSMP rule is vague on the issue of BMP maintenance requirements. It is also unclear how these BMP maintenance requirements will be enforced consistently across Los Angeles County. The rule, as currently written, requires property owners to "provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements, and/or Conditional Use Permits" (Requirements, Section 8). However, most BMPs simply have generally accepted standard (e.g., vendor recommended) maintenance requirements, while common sense dictates other maintenance schedules (e.g., cleaning catch basin grates at least once before wet season).

While it is clear that the SUSMP rule will allow developers and property owners to evaluate and determine the proper maintenance requirements in an agreement with municipalities, please provide additional clarification and guidance (e.g., guidance documents) for how municipalities will effectively and consistently approve, monitor and enforce these maintenance requirements.

Issue 4: Trash Storage Areas
The proposed SUSMP rule requires that all trash storage areas adequately prevent "offsite transport" of trash and "divert" drainage from adjoining roofs, etc. around trash areas.

The current restaurant industry practice of using self contained, self-enclosed dumpsters meets these requirements. The SUSMP rule should explicitly identify this as an acceptable BMP option for trash storage areas.

Issue 5: Parking Lots
In the Definitions section of the proposed SUSMP rule "parking lot" is defined as "land area or facility for the parking of commercial or business or private motor vehicles". In section 10 of the proposed SUSMP rule, Provisions Applicable to Individual Priority Project Categories, the proposed rule states that parking lots must be properly designed to "treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g., fast food outlets, lots with 25 or more parking spaces, sports event parking lots, shopping malls, grocery stores, discount warehouse stores)". It is unclear which threshold criteria (size, # spaces, type) is to be used to determine applicability of the SUSMP policy to a particular parking lot. It appears that a parking lot with only 10 spaces could fall under the definition of parking lot for the purposes of this rule, irrespective of other factors (e.g., use) limiting applicability.

CRA requests that the definition of a parking lot consider the relative level of "use" and be limited to lots with 25 or more spaces (i.e., lots with 25 spaces or less should be excluded form the rule and lots with 25 or more spaces should be evaluated for their inclusion based on relative level of use).

Issue 6: Additional Permit Requirements
It is unclear whether the SUSMP rule will require developers and property owners to obtain additional permits as a result of implementing the required treatment BMPs. For instance, will design and implementation of SUSMP treatment control BMPs for parking lot runoff require a property owner to obtain a treatment permit under DTSC Permit-by-Rule program? This poses potential operation and compliance, as well as cost, burdens that need to be considered when evaluating the cost effectiveness of the numeric treatment standards.

Please provide an assessment and impact analysis of the potential for additional permitting requirements due to implementation of the SUSMP rule.

CONCLUSION

CRA trusts that these comments will help the Board to develop a fair, effective, and consistent SUSMP rule while considering the concerns of the restaurant industry in Los Angeles County. Please feel free to contact me at any time should you have any questions or comments.

Regards,

John D. Claussen
for the California Restaurant Association

CC: Jot Condie, California Restaurant Association
Rick Burkett, Burger King Corporation
Fred Phillips, Burger King Corporation
Joyce Dery, Burger King Corporation
Marion Hoffman, Burger King Corporation
John Harrietha, Burger King Corporation
Mike Kissel, Carl Karcher Enterprises
Ed Conklin, McDonalds Corporation
Paul Deneka, Jack In The Box

Cabrillo Economic Development Corporation
11011 Azahar St., Saticoy, CA 93004 (805) 659-3791 Fax (805) 659-3195 Email: cabrillo@vcvista.net

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EXECUTIVE DIRECTOR

RODNEY E. FERNANDEZ

January 25, 2000

RECEIVED
2000 JAN 26 P 2:10
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the Los Angeles Regional Water Quality Control Board (Board) will be considering the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as part of the January 26, 2000 meeting agenda. As a provider of housing for very-low, low- and middle-income residents in Southern California, I am very concerned that certain requirements in the proposal will have serious impacts on housing affordability.

First, let me voice my strong support for the efforts of the Board in attempting to address the problem of water pollution caused by storm water runoff. After years of progress in cleaning our waterways by addressing point source pollution, it makes sense to continue that progress by turning our attention to non-point source pollution contained in runoff from urban areas. After reviewing your proposal, however, I have serious doubts that it will do anything to clean the water that flows to our beaches and oceans while adding to construction costs, thereby making an already unaffordable market even worse.

Currently in the Los Angeles metropolitan area, only 43 percent of households earning the median income can afford to own a home. That is 20 percentage points below the national average and one of the worst affordability rates in the nation. In my efforts to provide affordable housing I must rely on building a product that efficiently uses land to minimize the cost to the consumer. I fear that your proposal, especially the numeric design standard, will require me to use an inordinate amount of land to meet the numeric standard and unnecessarily increase costs to those who can least afford it.

R0069851

NCLR
A United Way Agency
NeighborWorks® member

I am particularly concerned with the fact that this costly, burdensome proposal was put forward without any rational scientific basis for pollution reduction. Nowhere in the December 7th proposal is there a discussion of the goals or timetables for pollution reduction, or, more importantly, any mention of the pollutants that this proposal is trying to mitigate. It seems extremely premature to implement such a wide-ranging and potentially damaging proposal that will deny housing to very-low, low- and middle-income families without having any idea of its ability to reduce water pollution.

I have had the opportunity to review the "Clean Water Initiative", supported by the Southern California Association of Governments and a number of groups and government professionals. This initiative takes a common sense approach to clean water by first, identifying what is polluting our water and then designing a program that seeks to reduce the pollutants. I respectfully request that you and the Board adopt the "Clean Water Initiative" as an altemative to the current proposal.

Sincerely,

Bernardo M. Perez, Project Manager

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board,
Los Angeles Region

CALIFORNIA
CEA ENVIRONMENTAL
ASSOCIATES

RECEIVED

2000 JAN 18 A 10: 20

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

January 14, 2000

Xavier Swamikannu
Storm Water Program
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Re: California Restaurant Association comments on the proposed Standard Urban Storm Water Mitigation Plan Rule

Dear Mr. Swamikannu,

California Environmental Associates (CEA) represents the California Restaurant Association (CRA) and Burger King Corporation (BKC). On behalf of CRA members in Los Angeles County, we submit the following comments on the proposed Standard Urban Storm Water Mitigation Plan for Los Angeles County (SUSMP) to the Los Angeles Regional Water Quality Control Board (Board).

GENERAL

CRA has reviewed the proposed SUSMP rule (December 7, 1999) and has developed comments requesting reconsideration of the numeric treatment standards and offering clarification on specific issues elsewhere in the rule.

CRA is interested in working with the Board, Los Angeles County, the co-permitees (municipalities), and other stakeholders to establish a fair and effective SUSMP rule. The CRA and their member organizations believe that, with the Board's consideration of the changes and clarifications discussed in this letter, the SUSMP rule will accomplish the goals and requirements of the Los Angeles County National Pollution Discharge Elimination System (NPDES) Permit.

CRA's comments address the proposed "SUSMP Provisions Applicable to All Categories" and the specific provisions applicable to priority project categories for "Restaurants" and "Parking Lots".

R0069853

423 Washington Street, 3rd Floor • San Francisco, CA 94111 • Ph: 415/421-4213 • Fax: 415/982-7989

NUMERIC TREATMENT STANDARDS

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- Not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.
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Issue 5: Parking Lots
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Please provide an assessment and impact analysis of the potential for additional permitting requirements due to implementation of the SUSMP rule.

CONCLUSION

CRA trusts that these comments will help the Board to develop a fair, effective, and consistent SUSMP rule while considering the concerns of the restaurant industry in Los Angeles County. Please feel free to contact me at any time should you have any questions or comments.

Regards,

John D. Claussen
for the California Restaurant Association

CC: Jot Condie, California Restaurant Association
Rick Burkett, Burger King Corporation
Fred Phillips, Burger King Corporation
Joyce Dery, Burger King Corporation
Marion Hoffman, Burger King Corporation
John Harrietha, Burger King Corporation
Mike Kissel, Carl Karcher Enterprises
Ed Conklin, McDonalds Corporation
Paul Deneka, Jack In The Box

CALIFORNIA
CEA ENVIRONMENTAL
ASSOCIATES

RECEIVED
1999 DEC 20 P 1:29
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

December 16, 1999

Dennis Dickerson, Executive Director
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Dear Dennis,

As a representative of Burger King Corporation, California Environmental Associates (CEA) has been monitoring and participating in the storm water policy efforts of the Regional Water Quality Control Board (Board). We have received the revised Standard Urban Storm Water Mitigation Plan (SUSMP) rule packet and have concerns about the deadline for submitting comments.

We are familiar with the revised SUSMP rule and are currently working with our contractors, architects, and franchisees to assess the impacts of the requirements and develop comments for submittal to your office by December 20, 1999 in preparation for the January 6, 2000 Special Board Meeting. We have also discussed the revised SUSMP rule with the California Restaurant Association and are working with them to notify their members of the proposed rule. Given the short turn-around time and the impending holidays, Burger King, and the industry as a whole, does not have adequate time to fully review, analyze and develop comments to meet these deadlines. Therefore, we request that you extend the review and comment period and move the Special Board Meeting to a date no earlier than January 26, 2000.

While Burger King is interested in working with Los Angeles County and the Board on the development and adoption of a successful SUSMP program, we are concerned about the significant impacts to restaurant development and operations in Los Angeles County and providing an opportunity for all stakeholders in the industry to respond. Our ability to provide your office with accurate and valuable comments requires that we be afforded additional time to see that this takes place.

Regards,

John D. Claussen
on behalf of Burger King Corporation

cc: Jot Condie, Director of Government Affairs, California Restaurant Association
Marion Hoffman, Government & Community Affairs, Burger King Corporation
Buzz Alexander, Corporate Architect, Burger King Corporation
Rick Burket, Director of Development - West, Burger King Corporation

423 Washington Street, 3rd Floor • San Francisco, CA 94111 • Ph: 415/421-4213 • Fax: 415/982-7989

CALPIRG
California Public Interest Research Group

STATE OFFICE
Los Angeles
11965 Venice Blvd. #408
Los Angeles, CA 90066
(310) 397-3404
(310) 391-0053 Fax
http://www.pirg.org/pirg/

LEGISLATIVE OFFICE
Sacramento
926 J St. #523
Sacramento, CA 95814
(916) 448-4516
(916) 448-4560 Fax

RECEIVED
1999 DEC 16 P 2:08
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

December 15, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I am writing on behalf of the California Public Interest Research Group (CALPIRG) to urge you to take action in January, 2000 to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters*. Specifically, we urge you to adopt the reasonable proposal set forth by your own staff to ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

R0069859

Berkeley
2034 Blake St. #9
Berkeley, CA 94704
(510) 644-3454

San Diego
3960 Park Blvd. Ste A
San Diego, CA 92103
(619) 297-5512

San Francisco
450 Geary St. #500
San Francisco, CA 94102
(415) 292-1487
(415) 292-1497 Fax

Santa Cruz
149 C Josephine St.
Santa Cruz, CA 95060
(831) 459-0553

Santa Barbara
1129 State St. #10-B
Santa Barbara, CA 93101
(805) 564-1207
(805) 965-8939 Fax

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,



Heather L. Hoecherl
Staff Attorney
California Public Interest Research Group

CDS TECHNOLOGIES



RECEIVED
JAN 1 0 2000
BY:.....

January 5, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the Los Angeles Times in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Walt Stein

Walt Stein
Manager – Project Development

R0069861

CDS Technologies, Inc. • http://www.cdstech.com/ • cds@cdstech.com
16360 South Monterey Road, Suite 250, Morgan Hill, CA 95037 • Phone: (408) 779-6363 • Toll Free: (888) 535-7559 • Fax: (408) 782-0721
1255 La Quinta Drive, Suite 218, Orlando, FL 32809 • Phone: (407) 855-8848 • Toll Free: (800) 848-9955 • Fax: (407) 855-7818

27200 Tourney Rd., Suite 200
Valencia CA 91355
Phone: (661) 288-5777
Fax: (661) 288-5748

Centex Homes

Fax

To:	Mr. Dennis Dickerson	**From:**	Jay Kopel
Fax:	213/576-6660	**Date:**	September 15, 1999
Phone:		**Pages:**	3 (Including cover sheet)
Re:	Urban Storm Water Mitigation	**CC:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

•Comments:

R0069862

CENTEX HOMES

27200 Tourney Rd., Suite #200
Valencia, California 91355

Phone: 661 288-5777
Fax: 661 288-5770

September 15, 1999

Mr. Dennis a. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

VIA FAX 213/576-6660

Re: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson, I am writing to request that you postpone taking any action that would implement numerical mitigation measures to BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture or a percentage of rainfall events at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Jay Koppel
Division President
LA/Ventura Division

Cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles

R0069863

27200 Tourney Rd., Suite 200
Valencia CA 91355
Phone: (661) 288-5777
Fax: (661) 288-5748

Centex Homes

Fax

To:	Mr. Dennis Dickerson	**From:**	Frank Faye
Fax:	213/576-6660	**Date:**	September 15, 1999
Phone:		**Pages:**	3 (including cover sheet)
Re:	Urban Storm Water Mitigation	**cc:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

•Comments:

R0069864

CENTEX HOMES

27200 Tourney Rd., Suite 6200
Valencia, California 91355

Phone: 661 286-5777
Fax: 661 286-5770

September 15, 1999

Mr. Dennis a. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

VIA FAX 213/576-6660

Re: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to improve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing, nor your letter of September 8, 1999, tell us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that " a numerical storm water mitigation measure be required for treatment controls."

The staff proposed summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear that large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

R0069865

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revised them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far-reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Frank Faye/LP.

Frank L. Faye
Vice-President, Land
LA/Ventura Division

(Dictated but not read)

Cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles

R0069866

CITATION HOMES

RECEIVED

2000 JAN 25 P 2:05

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board – Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP Completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. The Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outline in the Initiative is additionally supported by Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Scott A. Allen
President

R0069867

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region.

DALY & ASSOCIATES
Real Estate Entitlement, Project Management and Permit Expediting

January 25, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, suite 200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board – Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new, and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Vincent Daly
Daly & Associates

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

Attachment

31324 Via Colinas, Suite 113
Westlake Village, CA 91362
Phone (818) 889-7252 / Fax (818) 889-7085

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with all of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

R0069870

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Sun City Palm Desert®

HELEN McENERNEY
Vice President and General Manager

RECEIVED
2000 JAN 25 P 2:02
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board-Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Helen McEnerney

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069871

39755 BERKEY DRIVE PALM DESERT, CA 92211-1106 (760) 772-5300 FAX (760) 772-5303

DESERT PARTNERS, INC.

September 13, 1999

Mr. Dennis A Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

James S. Rasmussen
President

R0069872

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

PMB #131, 1775 E. Palm Canyon Drive #H, Palm Springs, CA 92264-1613
(805) 370-0075 FAX (805) 370-0165

DeVere Anderson Enterprises

January 24, 2000

Via Fax: 213.576.6625
5 Pages

Dennis Dickerson, Exec. Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 W. Fourth St., #200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Storm Water Mitigation Plan ("SUSMP") That will be discussed by the California Water Quality Control Board – Los Angeles Region ("Board") on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System ("NPDES") for Los Angeles County Municipal Storm Water Permit (Order #96-054).

As a Southern California resident and home building professional, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from storm water run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Board's efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams wetlands, bays and the ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that have made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definitions for "Hillsides," "Parking Lots" and "Environmental Sensitive Areas" have been dramatically changed since the September 16, 1999 Board hearing. These new definitions have not been discussed yet in a public hearing or with the regulated communities.

Definition of Hillsides R0069873

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, I suggest that the

Board modify the definition as "property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater," or delegate the authority of this definition to the local municipalities (i.e., the cities or county).

Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input from the municipalities, the regulated communities or interested parties. It is unclear why and how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not parking lots that are not associated with small commercial developments.

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input from the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. I suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input from the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by storm Water run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a realty. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-cited problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving storm Water pollution reduction.

Sincerely,

DeVere Anderson Enterprises

DeVere H. Anderson
President

DHA:ko

cc: Hamid Nahai, Chair
California Regional Water Quality Control Board – Los Angeles Region

Charles Gale
BIA/SC (via fax: 909.396.1571)

FILE [illegible]

January 19, 2000

Mr. Dennis Dickerson, Executive Officer
REGIONAL WATER QUALITY CONTROL BOARD
320 W. Fourth Street Suite 200
Los Angeles, CA 90013-1105

Dear Dennis:

STANDARD URBAN STORMWATER MITIGATION PLAN (SUSMP)

Attached is the SUSMP policy statement adopted by our Regional Council on January 6, 2000. This statement reflects a policy process by which our Water Policy Task Force and our Energy and Environment Committee considered extensive testimony on this issue last year. You are already aware of the resolutions adopted by three of the subregional councils of governments in Los Angeles County.

During the Regional Council's deliberation comments were made that gave emphasis to varying environmental, economic and developmental concerns. All of these comments underscored the need for improved water quality in our region. Your Board should know that the Council voted unanimously to support this policy for environmental protection.

This action recommends that the Board pursue an alternative to the proposal developed by your staff. We believe that a much greater pollutant reduction can be achieved with a TMDL-driven numeric process than with a volume-driven numeric process. It should be significant to the Board that the approach we are recommending will accelerate a TMDL process that now is suffering from limited resources and staffing, not to mention needed participation. Where a volume-driven numeric approach is described as requiring between 50-100 years to bring desired water quality, a TMDL-driven numeric approach is likely to bring success much more quickly. This owes to its focus on, among other things, pollutants of concern, watershed-scale mitigation strategies and a larger public/private community through which raising financial and organizational resources can succeed.

With scarce resources at our disposal we must work for water quality in ways that best utilize these resources. For this reason, SCAG stands ready to work with you and the Board to develop the implementation schedules and program budgets needed for storm water pollution reduction in each of the County's six watersheds. Efforts underway such as those in the Malibu Creek Watershed offer an example of what needs to be started in other places of the Basin. We await word of the Board's interest in this accelerated approach to pollution reduction.

In the interests of sharing this vision with your Board, please assist us by earmarking 10 minutes for us to give our comments at the January 26th meeting.

Sincerely yours,

Mark Pisano,
Executive Director

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

EAC
Version

R0069877

Final Tentative
December 7, 1999.

LOS ANGELES COUNTY URBAN RUNOFF AND STORM WATER NPDES PERMIT

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit, which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. ~~Each Permittee will approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.~~

Discretionary projects, that fall into one of seven categories are identified in the NPDES Permit as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units*

* (Note: this category is two separate categories in the NPDES Permit)

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements. These categories are:

Location adjoining~~accent to~~, bisecting or directly discharging to an environmentally sensitive area, and Commercial stand-alone p~~P~~arking lot ~~5,000 square feet or more or~~ with ~~25~~200 or more parking spaces and potentially exposed to storm water runoff

DEFINITIONS

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"100,000 Square Foot Commercial Development" means Developments based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

"Retail Gasoline Outlet" means a facility primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates permitted grading on any natural slope ~~and where grading contemplates cut or fill slopes~~. that is 25 percent or greater.

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

"Restaurant" means a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate

consumption. (SIC code 5812)

"Parking Lot" means land area or facility for the parking of commercial or business or private motor vehicles.

"Environmentally Sensitive Area" means ~~an area~~ the Significant Ecologocial Areas identified by Los Angeles County and any other areas of environmental significance as defined by the municipalities. ~~designated as an Area of Special Biological Significance by the State Water Resources Control Board or an area designated as a Significant Natural Area by the California Resources Agency or an area designated as an area of Ecological Significance by the County of Los Angeles.~~

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures,, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both treatment control BMPs and source control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Infiltration" means the downward entry of water into the surface of the soil.

"Directly Connected Impervious Area (DCIA)" means the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

Redevelopment" means the addition, to an already developed site, of 50 percent or more impervious area or improvements to 50 percent or more of the existing improvements on the site.

Hillside single family residences are exempt from this definition. ~~, on an already developed site, the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces .~~

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes , (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMPs contained herein to be consistent with the code, except where those practices would defeat or circumvent the intent of the SUSMP requirements.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate may result in a foreseeable increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable , the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* , USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

If applicable, project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that

enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.

Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required: (Individual single-family residences are exempt from these requirements)

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following *structural BMP* requirements: (Individual single-family residences are exempt from these requirements)

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, treatment control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, this verification will include the developer's signed statement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any treatment control BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the treatment control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If treatment control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Treatment control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

~~9. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS~~

~~Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.~~

~~a. Post-construction Treatment Control BMPs shall be designed to:~~

~~A. mitigate (infiltrate or treat) storm water runoff from either:~~

~~1. each runoff event up to and including the 85th percentile 24 hour runoff event determined as the~~

maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2.the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or

3.the volume of runoff produced from each and every storm event up to and including 0.75 inch of rainfall, prior to its discharge to a storm water conveyance system, or

4.the volume of runoff produced from each and every storm event up to and including a historical record based reference 24 hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24 hour runoff event,

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a.the roofing materials will not be a source of pollutants of concern in storm water, and

b.storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c.roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d.the storm water conveyance system does not directly or indirectly discharge to a natural stream or unlined channel or channel segment scheduled for restoration.

Exclusions

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the requirements of this Section.

9~~10~~. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

4. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS

Treatment control BMPs selected for use at one of these projects shall meet the design standards of this Section unless specifically exempted.

a. Post-construction Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. an 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or

3. the volume of runoff produced from a 0.50 inch storm event, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a. the roofing materials will not be a source of pollutants of concern in storm water, and

b. storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c. roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly discharge to a natural stream or channel segment scheduled for restoration.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

~~E.~~ PARKING LOTS

1. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS

Treatment control BMPs selected for use shall meet the design standards of this Section unless specifically exempted.

b. Post-construction Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

5. an 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

6. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or

7. the volume of runoff produced from a 0.50 inch storm event, prior to its discharge to a storm water conveyance system, or

8. the volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a. the roofing materials will not be a source of pollutants of concern in storm water, and

b. storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c. roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly discharge to a natural stream or channel segment scheduled for restoration.

~~**1. PROPERLY DESIGN PARKING AREA**~~

~~Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic~~

~~hydrocarbons that deposit on these surfaces from motor vehicle traffic. These pollutants are directly transported to surface waters.~~

~~Reduce impervious land coverage of parking areas~~
~~Infiltrate runoff before it reaches storm drain system.~~
~~Treat runoff before it reaches storm drain system~~

~~2. PROPERLY DESIGN TO LIMIT OIL AND PERFORM MAINTENANCE~~

~~Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.~~

~~Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces, sports event parking lots, shopping malls, grocery stores, discount warehouse stores)~~

- ~~Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control~~

11. WAIVER

A Permittee may, through adoption of an ordinance or code inc incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. Recognized situations of impracticability include (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately approved by the Regional Board Executive Officer before it becomes recognized and effective. A waiver granted to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee may ~~must~~ require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution, as determined by the Permittee. ~~in the storm watershed and operated by a public agency or a non-profit entity.~~

12. LIMITATION ON USE OF INFILTRATION BMPS

Three factors significantly influence the potential for storm water to contaminate ground water.

They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

In lieu of conducting a detailed BMP review to verify treatment control BMP adequacy, a~~A~~ Permittee may elect to accept a signed certification, from a Civil Engineer or Architect registered in the State of California, that the plan meets the criteria established herein. ~~and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria, in lieu of conducting detailed BMP review to verify treatment control BMP adequacy. The training must have been conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, or the California Water Environment Association) with the training and curriculum accepted by the Regional Board Executive Officer. For the certification to be valid, training must have been received not more than two years prior to the signature date on the plan.~~

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988 Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs.	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended/dry detention basins
- Infiltration basin
- Infiltration trenches
- • Wet ponds
- Constructed wetlands
- • Oil/Water separators
- • Catch basin inserts
- • Continuous flow deflection/ separation systems
- • Storm drain inserts
- Media filtration
- • Bioretention facility
- Dry-wells
- Cisterns
- • Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

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recd 12-28-99

Executive Advisory Committee
Stormwater Program - Los Angeles County

December 22, 1999

Mr. Dennis A. Dickerson
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

STANDARD URBAN STORMWATER MITIGATION PLANS

On behalf of the Los Angeles County Permittees, the Executive Advisory Committee (EAC) has reviewed the proposed Standard Urban Stormwater Mitigation Plan (SUSMP) prepared by the California Regional Water Quality Control Board (Regional Board) to be incorporated in the Los Angeles County Municipal Stormwater and Urban Runoff National Pollutant Discharge Elimination System (NPDES) permit (The Permit). In accordance with the conditions of the Permit, the Permittees submitted model SUSMPs for your review and approval. In the event our submittal does not meet with your approval, the Permit requires that you ask for a resubmittal. Your unilateral rewriting of the SUSMPs is very surprising. We disagree that you have the legal authority under the Permit to unilaterally require the implementation of an alternative SUSMP.

Given that there are substantial differences between the Model SUSMP submitted by the Permittees and what the Regional Board desires, we appreciate your efforts to draft an alternative SUSMP. In reviewing your proposal, we believe that many of your suggestions are acceptable and could be incorporated in a SUSMP that the Permittees would be willing to resubmit for Board approval. To assist in developing a SUSMP that is acceptable to all parties, we are offering comments to your proposed SUSMP. Our suggested changes are consistent with the Regional Board's desires and serve to clarify and facilitate implementation of the SUSMP consistent with the Permit requirements. The following is a discussion of our suggested changes:

SUSMP Categories

We agree with your approach to combine the two (10-99 and 100+ home) subdivision categories, but we do not agree with adding the two additional categories of environmentally sensitive areas and parking lots to the SUSMPs. These two categories are project characteristics and not project types. The seven priority project types are specifically mentioned in the NPDES Permit as requiring SUSMPs and were, therefore, included in the Development Planning Model Program (Model Program) in Part A of the Model Planning Priority/Exempt Checklist (Checklist).

Part B of the Checklist identifies characteristics that also determine a priority project. Part B includes, but is not limited to, project locations adjoining, bisected by, or directly discharging to a designated environmentally sensitive area, riparian corridor or wetland and parking lots with greater than 200 parking spaces for any office, commercial or industrial use. Since these two categories are already required in the Model Program to incorporate appropriate BMPs, we recommend the removal of the two additional categories from the SUSMP. Also, adding these categories would encompass a lot more project types for which the originally prepared SUSMPs were not intended to address and may not be appropriate.

Definitions

Hillside: We agree that the previous definition of hillside did not provide a consistent understanding throughout the County, but the current definition of hillside would render almost all development as being on a hillside which was not the intent of the program. We recommend changing the definition to read "property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25 percent or greater."

Environmentally Sensitive Area: The definition of "Environmentally Sensitive Area" is overly broad, to the point that stormwater discharges from virtually any development in Los Angeles County could be construed as discharging to an environmentally sensitive area. This is inconsistent with the intent to provide special protection for areas of special biological significance. Alternatively, we propose that for the purpose of identifying priority projects, "Environmentally Sensitive Areas" be defined as those that "adjoin, bisect, or directly discharge to the Significant Ecological Areas identified by Los Angeles County and any other areas of environmental significance as defined by the municipalities."

Redevelopment: Your proposed definition of redevelopment would require extremely minor projects, such as a hillside residence adding a room, to have the entire site come into compliance with stormwater regulations. This would not only place a financial burden on private citizens, but would require additional resources from the Permittees to implement this requirement. All other Federal and local regulations, such as the American Disabilities Act, contain thresholds before requiring full compliance. We recommend defining redevelopment as "the addition, to an already developed site, of 50 percent or more impervious area or improvements to 50 percent or more of the existing improvements on the site." We also recommend excluding hillside single family residences from this definition.

Sections 6 and 7 of the General Requirements

Section 6 covers the proper design of outdoor material storage areas and Section 7 covers the proper design of trash storage areas. Both of these sections are written as requirements that apply to all SUSMP categories. We recommend that individual single-family residences be exempt from this requirement.

Section 9 of the General Requirements

Section 9 covers design standards for Treatment Control BMPs. We contend that there are too many questions that need to be answered before a legally, economically, and technically feasible standard can be imposed on every Permittee's development planning programs. These questions involve the following: 1) how to implement the standard without having hydrologic data corresponding to the types of storms that are being

targeted, 2) what are the pollutants of concern for different types of development, and which BMPs are effective for these pollutants of concern, 3) if regional BMPs would be more effective than site specific BMPs, and 4) can we effectively influence routine maintenance of these BMPs. In order to develop answers to these questions, we support a voluntary standard in the SUSMPs. Los Angeles County and the Cities of Santa Monica and Calabasas are already implementing similar standards. We should assess these programs over the next two years and use the information to develop requirements for the next Municipal NPDES Permit. These requirements will then include technically defensible, economically feasible alternatives to provide water quality improvements that address pollutants of concern from new development and redevelopment in Los Angeles County.

Roofing Surface Exclusion

Part D disallows excluding the area of the roofing surface from the total area for calculation of rainfall or runoff volume to be treated if the storm water conveyance system directly or indirectly discharges to a natural stream or unlined channel or channel segment scheduled for restoration. We agree with your approach to include an exclusion for roofing surfaces. However, the terms "indirectly discharge" and "unlined channel" in Part D of this section could be interpreted to prevent almost all projects from meeting the exclusion criteria. We suggest changing the wording of Part D to read, "the storm water conveyance system does not directly discharge to a natural stream or channel segment scheduled for restoration."

Alternative Certification for Storm Water Treatment Mitigation

We agree with your approach to include this section in the SUSMP, but we feel that the certification should be required to be signed by a Civil Engineer or Architect registered in the State of California. This would provide assurance that the selection and design of the BMPs was conducted with technical expertise (State law precludes an Architect or Engineer from working outside their area of expertise). This would also provide recourse for negligent designs. Your wording would seem to allow an individual whose only "expertise" was taking a recognized class or seminar to design BMPs. This would, in many cases, violate State registration requirements and conversely, usurp the State Registration Board's authority over the practice of Architecture and Engineering.

We trust that you will find these suggestions satisfactory. If you believe that additional discussions are warranted, please let us know. We are prepared to meet and discuss these further. We look forward to working with you in developing a SUSMP the Permittees can resubmit to the Regional Board which will meet with the Board's approval.

Very truly yours,

Desi Alvarez
Chairman
Executive Advisory Committee

GH:kk

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cc: All Permittees
City of Long Beach
CRWQCB (David Nahai)

recd 12-28-99

Executive Advisory Committee
Stormwater Program - Los Angeles County

December 22, 1999

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Very truly yours,

Desi Alvarez
Chairman
Executive Advisory Committee

GH:kk

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cc: All Permittees
City of Long Beach
CRWQCB (David Nahai)

Executive Advisory Committee

Stormwater Program - Los Angeles County

RECEIVED
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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

December 16, 1999

Mr. Dennis A. Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

PROPOSED STANDARD URBAN STORM WATER MITIGATION PLAN

The Los Angeles County Municipal NPDES Permit Executive Advisory Committee (EAC) is in the process of preparing comments on the subject plan for the upcoming January 6, 2000 Regional Board Meeting. As suggested in your letter dated December 7, 1999, the EAC is consolidating its comments and is requesting specified presentation times for each of our three speakers. The speakers and time requested is as follows:

Desi Alvarez - 15 minutes
Richard Montevideo - 15 minutes
Robert Collacott - 20 minutes

As you are aware, the EAC has spent significant time and effort developing a Standard Urban Storm Water Mitigation Plan which complies with our NPDES Permit, all applicable State and Federal requirements, and can be implemented in all the various cities we represent. We feel we need the time requested to adequately present to the Board our thoughts on this very important issue.

Sincerely,

Teri Grant for

Desi Alvarez
EAC Chairman

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Sincerely,

Teri Hart for

Desi Alvarez
EAC Chairman

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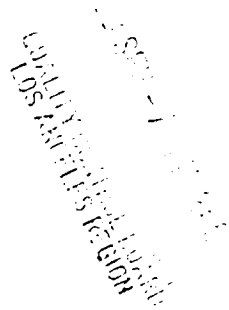
Executive Advisory Committee
Stormwater Program - Los Angeles County

August 31, 1999

Dr. Xavier Swamikannu
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105



Dear Mr. Swamikannu:

STANDARD URBAN STORMWATER MITIGATION PLANS

The Executive Advisory Committee (EAC) for the Los Angeles County National Pollutant Discharges Elimination System (NPDES) Permit wishes to express its opposition to the inclusion of a numerical standard in the Standard Urban Stormwater Mitigation Plans (SUSMPs). We offer the following as reasoning for this opposition:

1. There is insufficient information about the levels of relevant pollutants in the receiving waters to justify and require the additional expense of the Treatment Control Best Management Practices (BMPs) necessary to address numerical standards.
2. There is insufficient stormwater monitoring data available to demonstrate that the types of activities regulated by these SUSMPs are actually causing a negative impact to the receiving water.
3. Applying numerical standards to the approved Treatment Control BMPs constitute another requirement without an in-depth analysis of its cost implications to the public and agencies. There is insufficient numerical data regarding the effectiveness of the approved BMPs in order to determine which and how many BMPs will be required to achieve numerical standards. We believe an economic analysis would be imperative prior to requiring these numerical standards.
4. A set numerical standard which may be applicable for certain developments in one area may not be applicable for a similar development in another area.

The imposition of numeric limits and costs to the public that will result from these limits without supporting information is poor public policy. The Regional Water Quality Control Board, the County of Los Angeles and the 84 cities that are party to the NPDES Permit exist to serve and to protect the health, safety and well being of the same public. We need to work together to gather and analyze the information that is needed to implement efficient

and cost effective programs to improve water quality on their behalf. The structure of the current NPDES Permit is a testimony to the recognition of this issue by the Regional Board and the County and cities. The NPDES Permit requires the implementation of BMPs that can be implemented and defended because they are based on making a "best effort" and they do not cost the public an exorbitant amount of money. The inclusion of limits in the SUSMPs changes the intent of the NPDES Permit and erodes the ability of cities to defend and implement permit requirements.

If you have any questions, please call me at (562) 904-7102.

Very truly yours,

Diosi Alvarez
Chairman
Executive Advisory Committee

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cc: All Permittees
City of Long Beach
CRWQCB (David Nahai)

Not from LARWQCB - EAC Proposed draft

LOS ANGELES COUNTY URBAN RUNOFF AND STORM WATER NPDES PERMIT

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit, which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. ~~Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.~~ Urban Storm Water Mitigation Plans (USMPs) will be required for specific Priority Projects when SUSMPs are not appropriate and/or adequate for the specific project in review. The respective SUSMP or the site-specific

USMP will need to be incorporated into the project design prior to the issuance of any grading or building permits.

Discretionary projects, that fall into one of seven categories are identified in the NPDES Permit as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units*

* (Note: this category is two separate categories in the NPDES Permit)

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements. These categories are:

Location adjacent to or discharging to an environmentally sensitive area, and
Commercial stand-alone p~~P~~arking lot ~~5,000 square feet or more or~~ with ~~25~~200 (number still in debate with RWQCB) or more parking spaces and potentially exposed to storm water runoff

DEFINITIONS

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"100,000 Square Foot Commercial Development" means Developments based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

"Retail Gasoline Outlet" means a facility primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope ~~and where grading contemplates cut or fill slopes.~~ that is 25 percent or greater.

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

"Restaurant" means a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

"Parking Lot" means land area or facility for the parking of commercial or business or private motor vehicles.

"Environmentally Sensitive Area" means an area adjoining, bisecting or directly discharging to the Significant Ecologocial Areas identified by Los Angeles County and any other areas of environmental significance as defined by the municipalities. ~~designated as an Area of Special Biological Significance by the State Water Resources Control Board or an area designated as a Significant Natural Area by the California Resources Agency or an area designated as an area of Ecological Significance by the County of Los Angeles.~~

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures,, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both treatment control BMPs and source control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Infiltration" means the downward entry of water into the surface of the soil.

"Directly Connected Impervious Area (DCIA)" means the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

Redevelopment" means the addition, to an already developed site, of 50 percent or more impervious area or improvements to 50 percent or more of the existing improvements on the site. Hillside single family residences are exempt from this definition. ~~, on an already developed site, the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces.~~

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes , (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMPs contained herein to be consistent with the code, except where those practices would defeat or circumvent the intent of the SUSMP requirements.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate may result in a foreseeable increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable , the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* , USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

If applicable, project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.

Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required: (Individual single-family residences are exempt from these requirements)

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following *structural BMP* requirements: (Individual single-family residences are exempt from these requirements)

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, treatment control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, this verification will include the developer's signed statement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any treatment control BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the treatment control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If treatment control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Treatment control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS

(One of these options needs to be selected prior to resubmittal of this SUSMP to the RWQCB)

OPTION 1: This section is deleted from being applicable to all categories and is added so that it is applicable to only Parking Lots and 100,000 Square Foot Commercial, Industrial and Manufacturing Development;

OPTION 2: The section is left as-is (applicable to all categories), but has an implementation date of July 1, 2001.

Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

a. Post-construction Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. an ~~each runoff event up to and including the~~ 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or

3. the volume of runoff produced from a 0.75 inch ~~each and every~~ storm event ~~up to and including 0.75 inch of rainfall~~, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from ~~each and every storm event up to and including~~ a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a. the roofing materials will not be a source of pollutants of concern in storm water, and

b. storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c. roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly ~~or indirectly~~ discharge to a natural stream ~~or unlined channel~~ or channel segment scheduled for restoration.

Exclusions

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the requirements of this Section.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

~~E.PARKING LOTS~~

~~1. PROPERLY DESIGN PARKING AREA~~

~~Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic~~

~~hydrocarbons that deposit on these surfaces from motor vehicle traffic. These pollutants are directly transported to surface waters.~~

~~— Reduce impervious land coverage of parking areas~~
~~— Infiltrate runoff before it reaches storm drain system.~~
~~— Treat runoff before it reaches storm drain system~~

~~2. PROPERLY DESIGN TO LIMIT OIL AND PERFORM MAINTENANCE~~

~~Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.~~

~~— Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)~~

- ~~Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control~~

11. WAIVER

A Permittee may, through adoption of an ordinance or code inc incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. Recognized situations of impracticability include (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditicns at a site to attempt infiltration, and (iii) risk of ground water contamination because an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately approved by the Regional Board Executive Officer before it becomes recognized and effective. A waiver granted to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPS

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential*

Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051. USEPA (1994).

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

In lieu of conducting a detailed BMP review to verify treatment control BMP adequacy, a~~A~~ Permittee may elect to accept a signed certification, from a Civil Engineer or Architect registered in the State of California, that the plan meets the criteria established herein. ~~and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria, in lieu of conducting detailed BMP review to verify treatment control BMP adequacy. The training must have been conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, or the California Water Environment Association) with the training and curriculum accepted by the Regional Board Executive Officer. For the certification to be valid, training must have been received not more than two years prior to the signature date on the plan.~~

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988 Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs.	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended/dry detention basins
- Infiltration basin
- Infiltration trenches
- • Wet ponds
- Constructed wetlands
- • Oil/Water separators
- • Catch basin inserts
- • Continuous flow deflection/ separation systems
- • Storm drain inserts
- Media filtration
- • Bioretention facility
- Dry-wells
- Cisterns
- • Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

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Southern California
N.U.C.A. Chapter

September 14, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

On behalf of the members of the Engineering Contractors' Association I would like to strenuously voice our concern regarding the proposed implementation of numerical mitigation measures as they apply to storm water run-off. As a matter of policy we could ask that, at the very least, an appropriate level of scientific study be conducted before any requirements that may have significant ecomomic impacts on the construction industry are imposed.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

R0069926

(562) 861-0929 (800) 293-2240 Facsimile (562) 923-6179 E-mail: eca@flash.net
8310 Florence Avenue, Downey, California 90240

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Gary Futral, Executive Director
Engineering Contractors' Association

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

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2000 JAN 27 P 2:28
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LOS ANGELES REGION

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board- Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area", and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of the numerical mitigation standard. In addition, I ask that you support the comprehensive " Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Eric Shield
First American Title Company

PLANNING
DESIGN
LANDSCAPE ARCHITECTURE
ENTITLEMENT SERVICES
MAPPING AND PRESENTATIONS

FORMA
17500 Red Hill Avenue
Suite 100
Irvine, California 92614-5645
tel: 949.660.1900
fax: 949.660.9140
info@formacompanies.com

September 14, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well a the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,
FORMA

Carol S. MacFarlane

Carol S. MacFarlane, Associate
Director of Landscape Architecture

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

W:\clients\landscape\correspondence\susmp-bio.wpd

R0069929



GREYSTONE HOMES, INC.

25129 The Old Road, Suite 100
Stevenson Ranch, California 91381
Telephone (661) 260-2850
Fax (661) 222-9730

FACSIMILE COVER SHEET

DATE: 9-15-99

DELIVER TO: Dennis Dickerson

COMPANY: Regional Board

FAX NUMBER: (213)576-6660

FROM: Jeanne Smith

NO. PAGES (including cover): 4

Message:

THIS MESSAGE IS INTENDED FOR THE USE OF THE INDIVIDUAL OR ENTITY TO WHICH IT IS ADDRESSED AND MAY CONTAIN INFORMATION THAT IS CONFIDENTIAL. IF THE READER IS NOT THE INTENDED RECIPIENT, PLEASE CONTACT THE SENDER IMMEDIATELY AND NOTIFY THE RECIPIENT OF ITS RECEIPT.

R0069930

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GREYSTONE HOMES

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

GREYSTONE HOMES, INC.

Ventura Division
25129 The Old Road
Suite 100
Stevenson Ranch, CA 91381
Office 661-260-2850
Fax 661-222-9732

Sept. 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your Sept. 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMP's. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMP's and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMP's are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far-reaching requirements. Further, as a businessperson that would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMP's.

Sincerely,

Jeanne Smith
Assistant Project Manager
Greystone Homes, Inc.

Cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, L.A. Region

R0069932

GREYSTONE HOMES, INC.

Ventura Division
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Office 661-260-2850
Fax 661-222-9732

GREYSTONE HOMES

September 13, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to

R0069933

protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Bruce Crable

Bruce Crable,
Vice President of Operations
Greystone Homes, Inc.

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069934

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water

We commit to implementing quality Best Management Practices (BMPs)
We commit to doing demonstration projects and pilot programs on specific BMPs
We commit to developing watershed management plans for each watershed in the Basin
We commit to work cooperatively with **all** of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis

Waste Load Analysis
Cost Effectiveness Analysis

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

* *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*

the Board monitor pilot programs similar to those underway in Los Angeles County.

the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.

the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.

the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.

the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.

the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.

the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.

* *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

HELLMUTH, OBATA + KASSABAUM, INC

h+k Interiors

October 22, 1999

Mr. Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Staff Proposal to Reduce Runoff from New and Redevelopment

Dear Mr Dickerson:

Los Angeles stands at a critical juncture in its environmental history Brought to this point by extensive development with a complete disregard for the quality and quantity of runoff generated, today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

On January 6, 2000, you and the Board have the opportunity to change our course toward worsening water pollution by adopting the reasonable proposal set forth by your own staff. Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to a three quarter-inch storm. The Los Angeles Region already suffers from some of the worst water quality in the nation. Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effecuve way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Susan Grossinger
Senior Vice President, Hellmuth, Obata + Kassabaum, Inc.
Member, Board of Directors, Heal the Bay

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Santa Monica, California 90404 USA
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Washington DC

HARVEY STEINBERG, AICP
PRESIDENT

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th St., Ste. 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

RE: Standard Urban Storm Water Mitigation Plan

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water; however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area", and the addition of "Parking Lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater runoff. That is why I support the attached "Clean Water Initiative", which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

INNER CITY PLANNING AND DEVELOPMENT, INC. (213) 665-8133
2023 KENILWORTH AVENUE, LOS ANGELES, CALIFORNIA 90039

R0069938

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Respectfully,

Harvey Steinberg
INNER CITY PLANNING and DEVELOPMENT, Inc.

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board
Los Angeles Region

John L. Hunter
AND ASSOCIATES, INC.

Post-it® Fax Note 7671 | Date 1/14/00 | # of pages ▶ 4
To XAVIER | From John Hunter
Co./Dept. | Co.
Phone # | Phone # 562 802 2880
Fax # 213 576 6640 | Fax #

January 15, 2000

Dennis Dickerson, Executive Director
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Subject: Standard Urban Stormwater Mitigation Plans (SUSMPs)

Dear Mr. Dickerson;

The development and implementation of the SUSMP program has evolved into one of the most contentious issues of the entire NPDES Stormwater Program. Only now, when the deadline has arrived, are many agencies realizing the total breath and scope of the program and the commitment to reducing stormwater pollution that is required. Many farsighted cities have taken up the challenge of developing a workable SUSMP program, some as early as 1998. These cities include:

Arcadia	Hermosa Beach	Sierra Madre
Baldwin Park	Pasadena	South El Monte
Cudahy	Rancho Palos Verdes	South Gate
Culver City	Redondo Beach	Temple City
El Monte	San Fernando	West Hollywood

As with any program of this magnitude, the status varies between individual cities. Some cities already meet essentially all of the major tasks required of the SUSMPs. Others are waiting for the formal approval before finalizing their programs. Adjustments to the cities' programs to meet the final guidelines are not anticipated to require a major effort. These Cities have always supported the Regional Board's reasonable efforts to reduce stormwater pollution.

This program is very complex and highly technical. The Board's staff should be commended for their effort thusfar to simplify and streamline the requirements as much as possible. Having been in the forefront, these cities have overcome many of the technical difficulties associated with a program still in its infancy.

13310
FIRESTONE BLVD. A-2
SANTA FE SPRINGS
CALIFORNIA
90670
(562) 802-7880
FAX (562) 802-2297

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HAZARDOUS
SUBSTANCE
REMEDIATION
LIC. 3382

R0069940

To improve the program further we offer the following recommendations to the December 7th draft SUSMP program:

Item 2 - Conserve Natural Areas: This requirement contains phrases such as:

"Every effort shall be made",
"Maximize,
"Wherever practical", and
"Preserve"

These are very vague and offer little guidance on what constitutes adequate compliance with the SUSMP program. Reference materials are equally vague. In lieu of specific standards, Cities are left only with their best judgment, which often may not be defensible. At this time, cities should have broad discretion of what constitutes compliance with this item.

3 - Minimize Stormwater Pollutants of Concern: This section refers to many guidance documents for selection of many types of Best Management Practices for many differing situations. There are often several different BMPs any one of which would adequately reduce stormwater pollution. It is not clear if the cities have the discretion to (1) approve a single BMP, (2) a combination of several or (3) are all applicable BMPs required in every situation?

Clearly, requiring every BMP in every situation is not feasible. It must be clear in the SUSMP guidelines that cities have the authority to determine which BMPs are appropriate (see comment item 11).

6 & 7 Outdoor storage and trash areas: Our interpretation thusfar is that these items do not apply to single family dwellings. To eliminate future difficulties, items single family dwellings should be specifically exempted from these requirements.

9 - Design standards: Establishing the design standard as a volume (¾ inches) is pertinent for the capture of rainfall, but not for treatment since treatment equipment is generally rated in gallons per hour. Typical rainfall intensity varies from one location to another (¾ inch per 48 minutes in some areas, ¾ inch per 55 minutes in others, etc.). The criteria for treatment should be a simple easy to remember number throughout the County. We suggest using ¾ inches of rainfall per hour.

Also, the Executive Office, after consultation with the permittees, should have the authority to revise the standards based upon the results of any future credible studies.

General Comment for section 10 A - E: These sections contain many specific requirements. Experience has shown that not all will be feasible in every case. In fact, in most cases an appeal will be made by the builder or developer to waive or modify one or

more requirement for cost, location, space, aesthetic or planning reasons. There is no provision for the waiver or substitution of other BMPs of equal or greater value except to appeal to the Regional Board's staff on a case by case basis. (see next comment)

11-Waiver: This section as worded will result in the Board's staff quickly being inundated by appeals that will far outpace staffs ability to review cases. This could ultimately result in a near halt of many priority projects, clearly not the intent of the SUSMP program. As an alternative, Cities with effective programs should be allowed to approve substitutions (or waivers if appropriate) that are equal to or better than those specified in the SUSMP guidelines.

We recommend that two paragraphs be inserted into section 11:

Upon review and approval of the Board's Executive Officer, a Permittee's SUSMP review program may be authorized to either: Provide a for (1) a substitution of a BMP of equal or greater effectiveness in reducing pollutants in storm water runoff or (2) a waiver from any specified BMP requirement if the impracticability of the BMP for the individual property can be established. Recognized situations of impracticably in addition to those listed above, are: (iv) Cost of installing BMPs in redevelopment projects as compared with the overall cost of the redevelopment project, (v) if the requisite BMPs would necessitate extensive construction of areas outside of the proposed project's area, (vi) conflict with existing planning and city code requirements, or (vii) conflict with health and safety requirements. This authorization is subject to the same revocation procedure as above.

To be eligible this authorization, a permittee's principle plan reviewer must either meet the requirements of Section 13 or be (i) a California Registered Professional Engineer, and (ii) a Registered Environmental Assessor and (iii) have a minimum of 10 years of experience in reviewing stormwater runoff systems. The Executive Officer can modify this criteria as necessary to accomplish the goals of the SUSMP program.

Definitions

Hillside: The proposed definition of a hillside could result in many small projects being subject to the entire SUSMP program requirements. Projects of less than 1,000 square feet should be exempted from the Hillside SUSMP requirement.

In addition, the steepness of the site should be taken into consideration as well. The 25% slope suggested by Los Angles County should be incorporated into the definition. Permittees should also be given the option of modifying the slope to conform with city characteristics if justified.

Environmentally Sensitive Areas: It is realized that any list of these areas will change over time. But in order to move forward as rapidly as possible with effective implementation of the program, the Board should provide the lists as they exist within 30 days of SUSMP approval. The criteria of what constitutes discharging into an ESA should be:

Discharging directly into a listed environmentally sensitive area without having crossed through another jurisdictional boundary.

Redevelopment: This definition while technically accurate does not focus on stormwater concerns. A second sentence should be added:

The SUSMP need only address those areas being redeveloped unless the project exceeds the lesser of either 50% of the value of the site's existing improvements or other related threshold as established by the Permittee.

--- ---

Finally, forward thinking cities have continually made an effort to implement as many facets of the Planning Model Program as soon as reasonably possible as it has evolved over the last three years. As a result, city forms, outreach materials and policies have had to change with every new iteration. As an example, in the last few months, each cities' program was revised when the "0.75 capture" criteria was first espoused. Now, just a few months later, two new categories of SUSMPs are proposed, requiring a re-revision. Program modifications and fine-tuning are a normal course of any new program, but the constant major changes that this program has undergone have added to the challenge of implementing this program. Cities that have demonstrated the willingness to work towards the goal of achieving cleaner stormwater runoff should be granted the authority to work under the best guidelines available when the program was initiated and to augment the program when reasonably feasible.

We look forward to working with the Board in the continued implementation of the SUSMP portion of the overall NPDES Stormwater program. Please call this office if you have any questions.

Sincerely,

John L. Hunter, P.E.
President

Sheila Kennedy
Vice President

R0069943

John L. Hunter
AND ASSOCIATES, INC.

Post-it® Fax Note 7671 | Date 1/14/00 | # of pages ▶ 4
To XAVIER | From John Hunter
Co./Dept. | Co.
Phone # | Phone # 562 802 7880
Fax # 213 576 6640 | Fax #

January 15, 2000

Dennis Dickerson, Executive Director
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, California 90013-1105

Subject: Standard Urban Stormwater Mitigation Plans (SUSMPs)

Dear Mr. Dickerson;

The development and implementation of the SUSMP program has evolved into one of the most contentious issues of the entire NPDES Stormwater Program. Only now, when the deadline has arrived, are many agencies realizing the total breath and scope of the program and the commitment to reducing stormwater pollution that is required. Many farsighted cities have taken up the challenge of developing a workable SUSMP program, some as early as 1998. These cities include:

Arcadia	Hermosa Beach	Sierra Madre
Baldwin Park	Pasadena	South El Monte
Cudahy	Rancho Palos Verdes	South Gate
Culver City	Redondo Beach	Temple City
El Monte	San Fernando	West Hollywood

As with any program of this magnitude, the status varies between individual cities. Some cities already meet essentially all of the major tasks required of the SUSMPs. Others are waiting for the formal approval before finalizing their programs. Adjustments to the cities' programs to meet the final guidelines are not anticipated to require a major effort. These Cities have always supported the Regional Board's reasonable efforts to reduce stormwater pollution.

This program is very complex and highly technical. The Board's staff should be commended for their effort thusfar to simplify and streamline the requirements as much as possible. Having been in the forefront, these cities have overcome many of the technical difficulties associated with a program still in its infancy.

13310
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R0069944

To improve the program further we offer the following recommendations to the December 7th draft SUSMP program:

Item 2 - Conserve Natural Areas: This requirement contains phrases such as:

"Every effort shall be made",
"Maximize,
"Wherever practical", and
"Preserve"

These are very vague and offer little guidance on what constitutes adequate compliance with the SUSMP program. Reference materials are equally vague. In lieu of specific standards, Cities are left only with their best judgment, which often may not be defensible. At this time, cities should have broad discretion of what constitutes compliance with this item.

3 - Minimize Stormwater Pollutants of Concern: This section refers to many guidance documents for selection of many types of Best Management Practices for many differing situations. There are often several different BMPs any one of which would adequately reduce stormwater pollution. It is not clear if the cities have the discretion to (1) approve a single BMP, (2) a combination of several or (3) are all applicable BMPs required in every situation?

Clearly, requiring every BMP in every situation is not feasible. It must be clear in the SUSMP guidelines that cities have the authority to determine which BMPs are appropriate (see comment item 11).

6 & 7 Outdoor storage and trash areas: Our interpretation thusfar is that these items do not apply to single family dwellings. To eliminate future difficulties, items single family dwellings should be specifically exempted from these requirements.

9 - Design standards: Establishing the design standard as a volume (¾ inches) is pertinent for the capture of rainfall, but not for treatment since treatment equipment is generally rated in gallons per hour. Typical rainfall intensity varies from one location to another (¾ inch per 48 minutes in some areas, ¾ inch per 55 minutes in others, etc.). The criteria for treatment should be a simple easy to remember number throughout the County. We suggest using ¾ inches of rainfall per hour.

Also, the Executive Office, after consultation with the permittees, should have the authority to revise the standards based upon the results of any future credible studies.

General Comment for section 10 A - E: These sections contain many specific requirements. Experience has shown that not all will be feasible in every case. In fact, in most cases an appeal will be made by the builder or developer to waive or modify one or

more requirement for cost, location, space, aesthetic or planning reasons. There is no provision for the waiver or substitution of other BMPs of equal or greater value except to appeal to the Regional Board's staff on a case by case basis. (see next comment)

11-Waiver: This section as worded will result in the Board's staff quickly being inundated by appeals that will far outpace staffs ability to review cases. This could ultimately result in a near halt of many priority projects, clearly not the intent of the SUSMP program. As an alternative, Cities with effective programs should be allowed to approve substitutions (or waivers if appropriate) that are equal to or better than those specified in the SUSMP guidelines.

We recommend that two paragraphs be inserted into section 11:

Upon review and approval of the Board's Executive Officer, a Permittee's SUSMP review program may be authorized to either: Provide a for (1) a substitution of a BMP of equal or greater effectiveness in reducing pollutants in storm water runoff or (2) a waiver from any specified BMP requirement if the impracticability of the BMP for the individual property can be established. Recognized situations of impracticably in addition to those listed above, are: (iv) Cost of installing BMPs in redevelopment projects as compared with the overall cost of the redevelopment project, (v) if the requisite BMPs would necessitate extensive construction of areas outside of the proposed project's area, (vi) conflict with existing planning and city code requirements, or (vii) conflict with health and safety requirements. This authorization is subject to the same revocation procedure as above.

To be eligible this authorization, a permittee's principle plan reviewer must either meet the requirements of Section 13 or be (i) a California Registered Professional Engineer, and (ii) a Registered Environmental Assessor and (iii) have a minimum of 10 years of experience in reviewing stormwater runoff systems. The Executive Officer can modify this criteria as necessary to accomplish the goals of the SUSMP program.

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We look forward to working with the Board in the continued implementation of the SUSMP portion of the overall NPDES Stormwater program. Please call this office if you have any questions.

Sincerely,

John L. Hunter, P.E.
President

Sheila Kennedy
Vice President

11400 W. Olympic Blvd., 17th Floor, Los Angeles, CA 90064

January 10, 2000

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter - Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt a Standard Urban Stormwater Mitigation Plan for the Cities in Los Angeles County that requires mitigation, by specified new and redevelopments, through treatment or infiltration, of 100% of the runoff generated by the first three quarters of an inch of rain, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and few measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard was supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

cruz/kravetz: IDEAS

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In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Carl J. Kravetz
President/CEO

R0069949

JBI Process Equipment

Brent Cromar
5266 Forest Hill Drive
Pleasanton, CA 94588

January 5, 2000

RECEIVED
JAN 10 2000
BY:

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

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You have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

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R0069950

visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Brent Cromar

JCC HOMES

3480 Torrance Boulevard, Suite 300, Torrance, California 90503
Phone (310) 540-3990 • Fax (310) 316-7133

January 25, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, Ca. 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Storm Water Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board - Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination Systems (NPDES) for Los Angeles County Municipal Storm Water Permit (Order #96-054).

As a Southern California resident and home building professional, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting form storm water run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Boards efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams, wetlands, bays and the ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that have made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definition for "Hillsides, " "Parking Lots," and "Environmental Sensitive Areas" have been dramatically change since the September 16, 1999 Board

hearing. These new definitions have not yet been discussed in a public hearing or with the regulated communities.

Definition of Hillsides

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, we suggest that the Board modify the definition as property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county).

Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input from the municipalities, the regulated communities or interested parties. It is unclear why or how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not Parking lots that are not associated with small, commercial developments.

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input from the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition, leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input from the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits

have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by storm water run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association for Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving storm water pollution reduction.

Sincerely,

Kurt Nelson
J.C.C. Homes

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with all of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

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September 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th St., suite 200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson that would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

R0069957

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Joseph T. Lynch
President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069958

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January 25, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

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Justice & *Associates*

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Justice & *Associates*

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Sincerely,

Tom Taylor, R.E.A., R.E.M.
Justice & Associates

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

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- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with **all** of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *The Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *The Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *The Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *The Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language, which would then be available for municipal implementation throughout the Basin.*
- *The Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *The Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *The Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *The Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

KAUFMAN & BROAD

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2000 JAN 27 P 2:13 JAN 27 P 3:12
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Kaufman & Broad of Southern California Inc.

Patrick R. Loy
Vice President Land Development

R0069964

KAUFMAN AND BROAD OF SOUTHERN CALIFORNIA, INC. · GREATER LOS ANGELES DIVISION
801 CORPORATE CENTER DRIVE SUITE 201 POMONA CA 91768-2641 TEL 909 802 1300 FAX 909 802 1128

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with **all** of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input for the municipalities, the regulated communities or interested parties. It is unclear why and how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not Parking lots that are not associated with small commercial developments.

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

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[PAX] 818-830-6950

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

John Laing Homes
Hand crafted since 1848

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Dave J. McKenzie
John Laing Homes

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069969

11-347 390

John Laing Homes

16380 Roscoe Boulevard, Suite 200
Van Nuys, CA 91406
Tel: (818) 830-3360 Fax: (818) 830-9810

Fax Transmittal Cover Letter

DATE: 9.15.99 **TOTAL PAGES (including cover)** 3

TO: DENNIS DICKERSON

COMPANY:

FAX #: 213.576-6660

FROM: DAVID J. MCKINZIE

RE: SUSMPs

COMMENTS:

This message is intended only for the use of the individual or entity to which it is addressed and may contain information that is privileged, confidential and exempt from disclosure under applicable law If the reader of this message is not the intended recipient, or the employee or agent responsible for delivering the message to the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone, and return the original to us at the above address via the U.S. Postal Service. Thank You.

R0069970

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TEL 818-830-3360

September 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

John Laing Homes
Hand crafted since 1848

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to

protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

David J. McKinzie

David J. McKinzie
Division President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069972

JOHN LAING

HOMES

JOHN LAING BUILT HIS FIRST HOME IN 1848

LA/ VENTURA DIVISION
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VAN NUYS, CA 91406
(818) 830-3360
FAX (818) 830-6950

FACSIMILE TRANSMITTAL

TO: Dennis A Dickerson

FAX #: (213) 576-6660

FROM: Sid Paul

RE: Standard Urban Storm Water Mitigation

DATE: September 15, 1999

NUMBER OF PAGES (INCLUDING COVER SHEET): 2

MESSAGE:

R0069973

JOHN LAING

HOMES

JOHN LAING BUILT HIS FIRST HOME IN 1848

September 13, 1999

Mr. Dennis A Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Sidhartha Paul, Project Manager
John Laing Homes

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

16380 ROSCOE BOULEVARD, SUITE 200
VAN NUYS, CA 91406
TEL: 818-830-3360
FAX: 818-830-6950

R0069974

LANTEX

Landscape Architecture-Planning

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Blake Hinman ASLA
Principal

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069975

11-349 387

31726 Rancho Viejo Road • Suite 206 San Juan Capistrano, CA 92675
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JAN 24 '00 16:07 STOFF/FIL 7149930706 P.2/2

Land Tech Engineering

CIVIL ENGINEERING • LAND PLANNING • LAND SURVEYING

September 15, 1999

Dr. Xavier Swamikannu
California Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Consideration of Approval of the Standard Urban Storm Water Mitigation Plans (SUSMP) for Los Angeles County

Dear Mr. Swamikannu:

This letter is in response to the Board's consideration of the Standard Urban Storm Water Mitigation Plans (SUSMP) that your staff is recommending for approval by your board on September 16, 1999. We have reviewed the SUSMP prepared by Los Angeles County and your staff's recommendation of numerical mitigation measures.

With respect to Los Angeles County's SUSMP, we have the following concerns:

- The SUSMP specifies that each development "must be designed so as to mitigate the site runoff from each and every storm event up to and including 0.75 inches of rainfall." This condition creates some problems.

  - The use of 0.75 inches of rainfall has to be converted into direct runoff. The County has not specified how you will calculate this direct runoff. This needs to be specified in their plan. We cannot quantify the magnitude of improvements necessary without knowing you much water we will have to deal with.

  - Mitigating for "each and every storm event" is not practical. If a storm event occurs within 3 – 4 days of a previous event, how much pollutants could be left from the previous storm. Treating all storm water in a 24 hour period creates a heavy burden on any project. The intent of mitigating for pollutants is the purpose of the plan. Unnecessarily designing for continuous storms will only add to the public's cost burden.

  - We have done some quick calculations for a 20 acre subdivision site of 100 homes. We have assumed direct runoff of 75% of the rainfall of 0.75 inches. This yields runoff of 306,281 gallons of water. The treatment of this much water would require an area 100 feet by 136 feet by 3 feet deep to store prior to treatment. Allowing 85% of the suspended particulate matter to settle our will require approximately 48 hours. Therefore we will have to provide capacity of up to 2 storm events, increasing the basin size by 100% to a capacity of 612,567

14555 Erwin Street, Van Nuys, California 91411 • (818) 909-6550 • Fax: (818) 909-6555

gallons. This will require an area 200 feet by 136 feet by 3 feet deep. This will cover the area of approximately 5-6 single family homes, which effectively raises the prices of new homes by 6 – 8% just to cover the land necessary to hold the water.

- The County SUSMP is incomplete. There are BMP's listed for each type of project but their applicability and design criteria are not shown. How can this plan be implemented without specifying what treatment is to be used for each project. We cannot asses the true impact of this plan until the actual BMP applicability and design criteria is created. As engineers, we feel this is the "most important part of the plan" and it's missing.

- This is no specification in the County's SUSMP of the type of pollutants that will be treated for in each type of project. Where will this determination be made and who will make it has to be included in the plan.

With respect to the CRWQCB staff's recommendation of including a numerical mitigation in the plan.

- The plan and you staff's recommendation of 85th percentile storms and an arbitrary use of 0.75 inches of rainfall for Los Angeles County creates a massive amount of water that needs to be treated for a project. Per my previous comments, the treating of a 20 acre subdivision will create approximately 306,281 gallons of runoff to be treated. We feel that a lower number is justified since the pollutants will be washed off the site under much lower rainfall conditions.

- The wording in the staff's recommendation of "capture" the runoff indicates that direct detention of the runoff is necessary. This statement needs to be clarified to determine the direct impact to projects.

In closing, we recommend that adoption of the SUSMP be postponed until these issues can be reviewed.

Please feel free to contact us if you have any questions.

Sincerely,

LAND TECH ENGINEERING

A. LAURENCE TUMA III, P.E.

\\CAD#3\F DRIVE\WP DOCS\Project Folders\BIA-SUSMP\Letter to Dr. Swamikannu 9.16.99.doc

LEGACY PARTNERS

Legacy Partners
30 Executive Park, Suite 100
Irvine, CA 92614-6741
Phone: 949. 261.2100

January 18, 2000

Mr Dennis Dickerson
Executive Officer
Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standard Urban Stormwater Permit

Dear Mr Dickerson:

As a project manager for a local industrial development, I believe it to be important to inform you of certain successes that have been achieved relative to on-site storm water management.

The involved project is known as Los Angeles Media Tech Center. This project is approved for 750,000 square feet in 12, two-story, concrete tilt up buildings. The site contains 49.32 gross acres and was formerly a portion of the Union Pacific Railroad's Taylor Classification Yard at San Fernando Road and the Glendale Freeway. Phase 1, involving 396,000 square feet in 7 buildings, is now under construction and to be completed in Spring, 2000. Phase 2 will be underway shortly thereafter.

During our entitlement processing, certain preferred environmental mitigation measures were identified by local conservation groups, primarily represented by Friends of the Los Angeles River. After appropriate negotiation, an agreement was reached, the language of which was included in our conditions of approval. Essentially, the agreement provides that the project shall, among other things, retain on site a ½ inch rain event, without discharge from the site. This rain event was chosen by identifying the savings from on-site storm drains and applying this amount toward the design and construction of an infiltrator system. The number of infiltrators that could be purchased through the storm drain off-set resulted in the ½ inch retention. As we were the first industrial project to take on this task, there were design and engineering costs in excess of the amount budgeted for the storm drains, and timing for approvals were understandably protracted; however, future efforts will likely not face similar difficulties.

Los Angeles County promptly approved our storm drain connection permits (for those events over ½ inch per 24-hour period) as the impact to the existing flow was determined to be negligible. The City of Los Angeles just recently approved our infiltrator system. Installation is due to begin shortly. It is my belief that future efforts to utilize infiltrators as a retention device should now be somewhat easier in the city of Los Angeles.

While this method of storm water management may not be suitable for every site (percolation rates have a bearing), it should certainly be part of any prudent review. If you should require further information on the process, the system or the installation, please feel free to call me at (949) 261-9871 ext. 136.

I hope you have found this information to be helpful.

Best regards,

LEGACY PARTNERS COMMERCIAL, INC.
Michael P. Conway
Manager, Acquisitions & Development

R0069978

11-223

Lennar Communities

January 24, 2000

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West Fourth Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Stormwater Mitigation Plans (SUSMP)
Los Angeles County Municipal Stormwater Permit (Order No. 96-054)

Dear Mr. Dickerson:

After reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the proposed plan. Namely, the attempt to define "hillside" and "Environmentally Sensitive Areas," and the addition of "parking lots" to the list of projects subject to the SUSMP requirements which would restrict development and would make implementation of the SUSMP impractical in many municipalities in Los Angeles County. Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

I support the Clean Water Initiative (a copy of which is enclosed) which makes a commitment to clean water and, perhaps more importantly, supports a process that could make clean water a reality. The process outlined in the initiative is additionally supported by the Southern California Association of Governments and would involve the regulated community, municipalities and the environmental community in a process based on science and proven techniques.

I respectfully request that you and the Board delete the language that attempts to define "Hillside" "Environmental Sensitive Area" and "Parking Lots" expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. I also ask that you support the comprehensive "Clean Water Initiative" as a way of achieving stormwater pollution reduction.

Sincerely,

Teresa Sousa
Vice President
Community Development

TS:cap
ENCL/

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069979

11-338

25129 The Old Road, Suite 316, Stevenson Ranch, California 91381 — (661) 799-1185

Organizations referencing and/or as an attachment or as their sole submittal including the Clean Water Initiative form letter.

B & E Engineers
Sun Cal Companies
Ventura Affordable Homes, Inc.
Rottman Froman Communities
Lennar Communities
Ben Anderson
Inner City Planning and Development, Inc.
Taylor Woodrow Homes, Inc.
Bill Erlich
Southern California Contractors Association, Inc.
Los Angeles County Board of Real Estate
Shea Homes
Pardee Construction Company
DeVere Anderson Enterprises
Weston Communities
Ann Romano Associates

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with **all** of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

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Kent Wong
Alfie Woodard
Ron Yerxa

December 6, 1999

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, the *number one source of pollution to our coastal and inland waters.* In January 2000, I urge you to adopt the reasonable proposal set forth by your own staff to curb urban runoff: Ensure that specified new and redevelopments capture, treat or infiltrate 100% of the runoff generated by up to and including a three quarter-inch storm. By adopting this proposal, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming, creeks and streams with water that is unsafe to drink, and inland and coastal waters that pose health risks to aquatic life.

Your staff's proposal is supported by the *Los Angeles Times* in its October 6th editorial as a "promising new approach . . . [that] could well keep ocean pollution from worsening and help prevent beach closings," and a "good start in dealing with a tough problem."

The proposed standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of your staff's proposal will soon have a transformative impact on the amount of polluted

R0069983

Member of the Funding Exchange

11-277

runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please support your staff's proposal to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Lina Paredes
Program Officer

R0069984

11-278

The Chamber
Long Beach Area Chamber of Commerce

October 14, 1999

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation Plans (SUSMPs) Submitted For Approval To The Executive Officer Under The Los Angeles County Municipal Storm Water Permit (Public Notice No. 99-047)

Dear Mr. Dickerson:

The Long Beach Area Chamber of Commerce (The Chamber) has reviewed the Regional Water Quality Control Board's proposal to incorporate numeric mitigation measures (the first 0.75 inches of rainfall within a 24-hour storm event) into the SUSMPs. While The Chamber fully supports stormwater pollution reduction programs, we must express our concern with the numeric mitigation measures and offer some alternatives prior to the adoption of the SUSMPs.

On June 30, 1999 the California Water Quality Control Board unanimously adopted Order No. 99-060 making the City of Long Beach the first City in Los Angeles County to administer and implement its own Municipal Stormwater Permit. The Permit already incorporates many BMPs (Best Management Policies) and site specific SUSMP requirements. For example, at a minimum, peak runoff rates cannot exceed predevelopment levels, for developments where the potential for increased storm water discharge rates can result in an increase in downstream erosion potential and 25 percent of required landscape areas for new developments must be vegetated with xeriscape. Therefore, The Chamber is fully committed to the development of citywide SUSMPs, for the specific development categories detailed in our Permit, and requests the Board to consider the following prior to adoption:

- Studies to determine the "Pollutants of Concern" from storm drains in local/regional receiving waters and their true impact on beneficial uses. Is the 0.75" runoff mitigation appropriate and effective?

- Site specific studies to determine the impacts of runoff mitigation on water tables, soils and other environmental concerns unique to certain areas/cities.

- Studies to determine the 0.75" runoff mitigation's economic impact on new development and on Cities' economies implementing SUSMPs containing these numeric limits.

- Cost Analysis for the implementation and ongoing maintenance of Treatment Control BMPS.

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R0069985

- Cost benefit and effectiveness analysis of the 0.75" retention/treatment within the 24-hour period on the pollutants of concern on the receiving waters and impact on beneficial uses.

- Local/regional water studies and multi-year region specific monitoring and related data collection.

The Chamber supports the cities of Long Beach, Los Angeles and Lakewood and the Executive Advisory Committee in their opposition to the prescriptive measures and respectfully requests the Board give cities the opportunity to study and select programs that will result in real water quality improvements without significant unnecessary expenditures.

Sincerely,

Daymond W. Rice

Daymond W. Rice
Vice President Government Affairs

LOS ANGELES COUNTY BOARD of REALESTATE

The Voice of Real Estate representing private property rights in Los Angeles County

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Phone: (909)612-5707 • Fax: (909)612-5715
Email: lewisco@cyberg8t.com • Website: http://www.lacbor.org

VIA FACSIMILE

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Michael Lewis

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0069988

11-358

MALIBU BAY COMPANY

RECEIVED

2001 JAN 20 P 1:50

January 18, 2000

Mr. Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Re: Support for Standards to Reduce Runoff from New Development and Redevelopment

Dear Mr. Dickerson:

I am writing to you as a commercial property owner, developer, environmentalist, water sport activist (surfer, swimmer, paddler, skindiver and sailor) and concerned California citizen.

On January 26, 2000 you have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. I urge you to adopt a Standard Urban Stormwater Mitigation Plan (the "Plan") for the Cities in Los Angeles County, reducing urban runoff from new development and redevelopment. By adopting the Plan, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

As a property owner and developer in Malibu, we have self-imposed runoff regulations on two proposals we currently have pending. Both of these projects will retain and treat runoff from the new development. While it would be ideal if every property developer would volunteer this, the reality of the economics is that most do not. For this reason, I urge you to not only require retention and treatment of runoff, but to make the Plan's regulations (including the definitions and standards) specific and clear so that it can be properly planned and implemented. In addition it is critical that the exemptions from the definition of runoff as contained in the December RWQCB draft of the Plan be eliminated, particularly, the exemption of rooftop runoff (which is ludicrous).

Requiring treatment makes economic sense. While it is a significant cost to the developer to provide treatment, addressing the problems in the planning phase of construction is the most cost-effective way to solve the runoff problems (versus trying to fix problems after the fact). Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the coastline declines, so does business.

In a region that is constantly being built and rebuilt, adoption of new standards will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt standards to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

John Perenchio

R0069989

23705 WEST MALIBU ROAD SUITE D-2 MALIBU, CA 90265 (310) 456-6555 FAX (310) 456-9462

MIA LEHRER

+ associates

landscape architecture

+

2000 JAN 21 P 2:42

Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

I am a member of the Board of Directors of TreePeople, and I wanted you to know that after five years of research, TreePeople has demonstrated the benefits and feasibility of capturing rainwater and recycling it. TreePeople brought together leading experts to develop best management practices, and then showed how easily they could be implemented.

Now, you have the opportunity to significantly reduce urban runoff, the number one source of pollution to our coastal and inland waters. On January 26, 2000, we urge you to adopt reasonable design standards for sizing treatment control Best Management Practices at specified new and redevelopments: Ensure that these developments mitigate, through treatment or infiltration, 100% of the runoff generated by up to and including a three quarter-inch storm, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and little measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars annually, but these businesses are largely dependent on the health of the coastal resources to attract their customers. As the health of the

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Esther Margulies
Landscape Architect Ca. 3752

11-336

R0069990

coastline declines, so does business (just ask any businessperson near Huntington Beach) – and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exceptions, to mitigate the effects of urban runoff from new and redevelopment.

We've shown that it is feasible. Now it is up to you to ensure that it actually happens.

Thank you for your consideration

Sincerely,

Madeline

Member of the Board of TreePeople

R0069991

11-337

MID-CITIES ESCROW
8136 2nd St., Downey, CA 90241
Bus: (562) 904-3151
Fax: (562) 861-2251

September 13, 1999

Mr. Dennis A Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Liana Munden

Mid Cities Escrow
Liana Munden

R0069992

cc: Mr. Hamid Nahai, Chair

January 14, 2000

00 JAN 21 P 2:25

Mr. Dennis A. Dickerson
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Re: Proposed Standard Urban Storm Water Mitigation Plan and Regional Board Meeting of January 26, 2000

Dear Mr. Dickerson:

We are writing this letter in response to your request for written comments in advance of your upcoming Board Meeting of January 26, 2000.

As we have previously communicated to you, we strongly oppose the numerical standards proposed in the new Standard Urban Stormwater Mitigation Plan (SUSMP) guidelines. We also object to the most recent modifications which have been made to the previously submitted SUSMP's, specifically the addition of new categories and the additional restrictions definining "hillside development", the addition of a category for parking lots containing 25 or more spaces, and the additional category concerning projects discharging into an "environmentally sensitive" area.

The SUSMP guidelines you are proposing to adopt at the January 26, 2000, Regional Water Quality Control Board are totally unacceptable. These new SUSMP guidelines as written, will create significant cost increases for the entire development industry. This increased cost will directly affect our ability to provide affordable housing, and will have a negative impact on the profitability of commercial and industrial business as well.

We are all concerned with the environment, and we fully understand the importance of clean water, however, the development industry should not be singled out and unjustly accused of being the major cause of water pollution.

THE NEWHALL LAND AND FARMING COMPANY, 23823 VALENCIA BOULEVARD, VALENCIA, CA 91355-2194
TEL 661.255.4000 FAX 661.255.3960 WEBSITE: www.newhall.com

R0069993

Forcing our industry to design expensive, possibly ineffective structures which could create a serious maintenance liability over time, in order to meet a numerical standard that will not have a beneficial effect on the water, will certainly not benefit the general public.

Our industry has made a great deal of progress towards pollution prevention in recent years. We have made great strides in implementing various design features to minimize potential pollution, and we have continued to educate the contractors who work for us about the importance of applying best management practices during the construction process. These efforts have made a significant contribution towards prevention of pollution.

We are committed to continue our pollution prevention efforts, and have already agreed to the SUSMP guidelines which were originally submitted to the Regional Water Quality Control Board. The implementation of the original SUSMP guidelines without the numerical guidelines will further minimize any impacts that our industry may have on the environment.

As you know, the County of Los Angeles recently agreed to the 0.75 numerical standard in the unincorporated areas of Los Angeles in an effort to resolve a lawsuit filed by the Natural Resource Defense Council, without the input of our industry. To date, the projects submitted to them incorporating this requirement have not been consistent in the application of their design criteria. They have each specified a different way to meet this 0.75 numerical standard, and the costs for installation, the effectiveness of each method, and the complexity and costs for maintenance are still unknown. These projects should be studied over time and evaluated.

In closing, we would like to request that any new policies which are adopted by the Board become effective only on projects which have not received Tentative Map approval from the governing agency. We hope that the Board will invest the time it will take to study some of the projects which have been submitted through the County of Los Angeles to more fully understand the .075 requirement, the various types of Best Management Practices that will be cost effective to install and maintain, and that will have the desired results before adding additional requirements which may have no benefit to the environment, at a great cost to several industries.

R0069994

We hope that the Board will understand our position, and will work with us towards finding a logical, scientifically based approach to this issue.

Sincerely,

Ross Pistone

Ross Pistone
Vice-President of Operations

NEWHALL LAND

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BY:.....

December 13, 1999

Mr. Dennis Dickerson
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: Proposed Standard Urban Storm Water Mitigation Plans and Supporting Regional Board Resolution

Dear Dennis:

We are in receipt of your notice dated December 7, 1999, announcing that the Regional Board will be asked to adopt a set of newly revised Standard Urban Storm Water Mitigation Plans (SUSWMP's) at the upcoming Regional Board Meeting of January 6, 2000.

We are extremely concerned that you have made the decision to act on a matter of such magnitude to our industry in such haste. We were originally advised that The Board would not be taking action on this issue until the end of January. We were also totally unprepared for the extensive changes which have been made to the SUSWMP's that were originally discussed at the September 16, 1999 Public Hearing.

During the many discussions we have had with you and your staff since the original SUSWMP's were proposed, we advised you of the serious nature of our concerns regarding the proposed guidelines and the negative impact that they would have on the development industry, we had no indication that our concerns would be totally ignored, nor that the revisions to the SUSWMP's you would recommend to your Board would be even more restrictive than the previous versions. The revised SUSWMP's are totally unacceptable to us.

R0069996

THE NEWHALL LAND AND FARMING COMPANY, 23823 VALENCIA BOULEVARD, VALENCIA, CA 91355-2194
TEL 661.255.4000 FAX 661.255.3960 WEBSITE: www.newhall.com

In light of the extensive changes which you are recommending to the proposed SUSWMP plans, the introduction of two completely new categories, and the upcoming Holidays, we must have additional time to respond. As I am sure you realize, these newly revised guidelines were not made available to us until December 7, 1999, via the Internet. You have requested our comments by December 20, 1999, which is nine working days from the date we were provided with the revised guidelines. You then have requested that we make a joint presentation to the Board at the January 6, 2000 meeting, which is right after the Christmas Holiday, not allowing us adequate time to study the changes, understand the impacts, and make a formal presentation to your Board.

Due to the critical importance of this matter, and the far reaching negative impacts these new guidelines will have, not only on The Newhall Land and Farming Company, but the development and building industry throughout the Los Angeles Region, we ask that you grant this extension of time, and that you not request action by the Board on this matter until the end of January, as we were originally promised.

Sincerely,

Ross Pistone
Vice-President of Operations

cc: Jane Nelson
Tom Lee
Gary Cusumano
Regional Water Quality Control Board Members

NLF
THE NEWHALL LAND AND FARMING COMPANY
23823 Valencia Blvd., Valencia, CA 91355
Fax (661) 255-3960

FACSIMILE TRANSMISSION COVER SHEET

DATE: 9/9/99

TO: NAME: DR XAVIER SWAMIKANNU

COMPANY: RWQCB

FAX #: (213) 576-6660 PHONE #:

FROM: ROSS PISTONE

TELEPHONE: 661 255 4095

NUMBER OF PAGES: (including cover sheet)

REGARDING: - PUBLIC HEARING

MESSAGE: SUSMP COMMENTS

If you have a problem receiving this FAX, please call Martha Morness at (661) 255-4221.

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R0069998

September 8, 1999

Dr. Xavier Swamikannu
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Re: Written Comments Regarding The Consideration Of Standard Urban Storm Water Mitigation Plans Submitted For Approval To The Executive Officer Under The Los Angeles County Minicipal Storm Water Permit

Dear Dr. Swamikannu:

Thank you for the opportunity to comment on the Standard Urban Storm Water Mitigation Plans for the Los Angeles County and 84 Cities.

We are very concerned at having to rush these comments to you, as we did not receive the Notice of Public Hearing until today, and therefore did not have the opportunity to study the issues and submit our written comments to you by the deadline date requested in your Notice. These new Standard Urban Storm Water Mitigation Plan guidelines are complex in nature, and could have a significant financial impact on the Development Industry.

We would like to request an extension of time, to allow us the opportunity to have qualified engineers study these new guidelines to better understand the complexity of these new numerical standards for mitigation of storm water, and how what financial impacts these guidelines may have on our Industry.

This is an extremely important issue, and we urge you to grant us more time to review these guidelines and comment on them before the Regional Board makes a decision on this matter.

R0069999

THE NEWHALL LAND AND FARMING COMPANY, 23823 VALENCIA BOULEVARD, VALENCIA, CA 91355-2194
TEL 661.255.4000 FAX 661.255.3960 WEBSITE: www.newhall.com

Our primary concern with these SUSMP'S are the numerical standards which have been established for each of type of development - in particular:

B. YOUR RECOMMENDATION - Page 2 of the Notice of Public Hearing:

"Incorporate in, "SUSMP-Section 3. Minimize Storm Water Pollutants of Concern", numerical mitigation measures for BMP design criteria based on the "mitigation" of smaller storms to capture a large percentage of runoff events, runoff volume and pollutant loads.

This mitigation measure may be derived from:

1. The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area (Urban Runoff Quality Management, WEF Manual of Practice No. 23/ASCE Manual of Practice No. 87, 1998), or

2. a historical-record based reference 24-hour rainfall criterion (0.75 inch for the Los Angeles County area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

OUR CONCERN -

The establishment of a numerical standard for Treatment Control BMP'S and the requirement that each new type of development treat the runoff from each and every storm in excess of this numerical limitation (0.75 inches) is unnecessary, and would be costly to design and implement for every type of development listed in the SUSMP guidelines.

R0070000

For instance, a residential project would have one type of pollutant runoff and a commercial building or shopping center would have a very different pollutant potential. To design the same numerical stipulation for the treatment of runoff for all types of development when they have very different designated uses and pollutant potentials is unnecessary and impractical.

We have not been made aware of any scientific data to substantiate that these elaborate measures would actually be necessary, nor that preventing runoff from storm water would actually have a significant impact on pollution to our waterways.

It seems that our combined objective with these SUSMP's should be to reduce any potential pollutants from entering the waterways of America, and the suggested methods listed in the SUSMP's will reduce the pollutants without these numerical standards.

We believe that it would be burdensome, unnecessary, and costly to require a numerical factor that may not actually improve the quality of the water leading to the waterways of America, and would actually add significant costs to the end product user, making a home more costly to the general public, and possibly preventing some people from even qualifying for the purchase of a new home.

We understand that some of the treatment control BMP's included in the SUSMP's will need to be reviewed over time to determine their cost and their effectiveness. We can only speculate at this time what impact these measures will have on us.

We strongly urge you to remove any mention of numerical stipulations for the mitigation and treatment of runoff related to storm events from all categories of development listed in the SUSMP's.

We would like to suggest that a Task Force be established including members of our Industry, the County, Cities and Regional Water staff to discuss these guidelines, and together seek a reasonable and workable solution. We also will need additional time to fully understand the impacts these requirements may have on our business and our customers.

We appreciate your interest in making sure that these new requirements effective and reasonable.

Sincerely,

Ross Pistone

Ross Pistone
Vice-President of Operations

cc: R. Pearl - BIA

R0070002

NEW URBAN WEST, INC.
520 Broadway, Suite 100
Santa Monica, CA 90401
FAX 310 . 394 . 6872
Telephone 310.394.3378

Fax

To: Dennis Dickerson From: CECIL UY

Fax: 213/576-6660 Pages: 2

Phone: Date: 9/16/99

Re: CC:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

• Comments:

Please see attached letter regarding the standard Urban Water mitigation.

R0070003

NEW URBAN WEST, INC.
520 Broadway, Suite 100
Santa Monica, CA 90401
FAX 310 . 394 . 6872
Telephone 310.394-3379



September 16, 1999

Mr. Dennis A Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Re: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall evens at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environment benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements. I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Tom Zanic
Vice President

R0070004

Cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

PACE
ENGINEERING, INC.

September 14, 1999

LOS ANGELES REGION

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

R0070005

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ESTABLISHED 1967

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area civil engineering firm involved in design and development, I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Charles G. Novak
President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region
Richard Lambros – Executive Vice President
Building Industry Association of Southern California

R0070006

pacific bay
HOMES

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

As a Southern California resident and home building professional, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from stormwater run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Boards efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams, wetlands, bays and the ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that has made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definition for "Hillsides," "Parking Lots," and "Environmental Sensitive Areas" have been dramatically changed since the September 16, 1999 Board hearing. These new definitions have not been discussed yet in a public hearing or with the regulated communities.

Definition of Hillsides

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, we suggest that the

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Board to modify the definition as property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county). This definition has been studied extensively in many municipalities, such as Santa Clarita, and specific guidelines have been adopted.

Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input for the municipalities, the regulated communities or interested parties. It is unclear why and how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not Parking lots that are not associated with small commercial developments.

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also

supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Very truly yours,

Glen K. Yamamoto

GLEN K. YAMAMOTO
Pacific Bay Homes

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with **all** of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

pacific bay
HOMES

September 14, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th St., #200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is s new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999 tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is 'to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water

23770 Valencia Blvd., Suite 200, Santa Clarita, CA 91355
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Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this t ime.

Sincerely,

PACIFIC BAY HOMES

Glen Yamamoto

Glen Yamamoto
Project Manager

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070013

pacific bay
HOMES

September 14, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th St., #200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

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Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once, again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

PACIFIC BAY HOMES

Glen K. Yamamoto
Project Manager

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070014

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PACIFIC SOILS ENGINEERING, INC.
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(Corporate Headquarters)

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: **Standard Urban Storm Water Mitigation Plan**

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

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ADOPT THE SUSMP WITH AMENDMENTS

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R0070015

Definition of Hillsides

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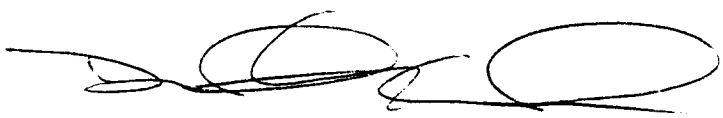
"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,
PACIFIC SOILS ENGINEERING, INC.



Daniel T. Martinez,
President

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved stormwater management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

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Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
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approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

PACIFIC SOILS ENGINEERING, INC.
10653 PROGRESS WAY, P.O. BOX 2249, CYPRESS, CALIFORNIA 90630
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(Corporate Headquarters)

QUALITY CONTROL BOARD
LOS ANGELES REGION

September 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With

R0070020

the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Daniel T. Martinez, President
PACIFIC SOILS ENGINEERING, INC.

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

PACIFIC SOILS ENGINEERING, INC.
10653 PROGRESS WAY, P.O. BOX 2249, CYPRESS, CALIFORNIA 90630
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(Corporate Headquarters)

September 15, 1999

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

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Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Daniel T. Martinez, President
PACIFIC SOILS ENGINEERING, INC.

R0070022

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

Pardee Construction Company
A Weyerhaeuser Company

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www.pardee-homes.com

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I understand that the Los Angeles Region Board of the California Regional Water Quality Control Board will hold a public hearing on January 26, 2000 regarding the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California homebuilder I support the goals of clean water. However, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions of the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. More specifically, I am concerned with the definitions of "Hillside" and "Environmental Sensitive Area," and the addition of "Parking Lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many communities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, forces me to oppose the proposed SUSMP as it is presently drafted.

Again, I fully support the goal of properly cleaning stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality.

The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

In review of the concerns noted above, I request that the Board delete language expanding the scope of the SUSMP, and reject the implementation of a numerical mitigation standard. In addition, I ask that the Board support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Leonard S. Frank
Pardee Construction Company

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070023

11-366



PLAYA VISTA

12555 W. JEFFERSON BLVD. # 300
LOS ANGELES, CALIFORNIA 90066

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FAX: 310.821.9429

January 21, 2000

Mr. Dennis Dickerson, Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: **Comments on Proposal to Reduce Runoff from New and Redevelopment under the Municipal Stormwater Permit**

Dear Mr. Dickerson:

Thank you for this opportunity to provide comments on the proposed model program for stormwater management in new and redevelopment.

Background

For your information, Playa Vista is a new residential and commercial development in West Los Angeles which has recently won the Local Government Commission western United States Awahanee Award for its unique sustainable design. Incorporated into this design is a cutting edge stormwater management program. Playa Vista, for over 10 years, has been actively incorporating evolving stormwater management concepts into its development and redevelopment plans. In fact, Playa Vista, to demonstrate its leadership on this important ocean protection issue, has chosen to set a goal for itself of no increase in pollutants of concern after development of the project. This level of performance is well above your proposed standard.

However, it is important to note that Playa Vista had a unique opportunity to accomplish this objective because of the significant off-site areas that drain through the property. Most projects will not have this kind of opportunity.

Assessment of Board Proposal

We agree with the basic concept that there is a need to develop criteria for new projects to manage stormwater in a way that reduces the increase in pollution from new developments.

You and the Los Angeles municipalities do have the opportunity to significantly reduce urban runoff pollution through the adoption of criteria for controlling urban runoff, which has been cited as the number one source of pollution to our coastal and inland waters. We encourage all parties to move forward in establishing a program to improve the runoff from development and redevelopment projects. The Playa Vista project is very concerned with the health of the Santa Monica Bay in general, and specifically the Ballona Creek estuary area and Marina del Rey. Both of these water bodies are viewed

as a ecological assets to the project and our project has been designed to integrate protections for these resources into our surface water management program. The project is very concerned about the continued degradation of these waters by general urban runoff, which includes trash and debris as well as other pollutants. The long term health of our planned restoration of the Ballona wetland and the creation of a new water feature and habitat areas adjacent to the Marina del Rey is also dependent on upstream water quality.

While we support the intent of the Board's proposal, we would like to recommend some additional technical assessments that if done before adoption of the Board's proposal would provide for a strong result. These include:

The rainfall analysis performed is very limited. First, the analysis of only a couple of raingages is problematic in that there is the potential for a wide variation in storm characteristics that might lead one to develop more specific standards. Second, the rainfall analysis was performed on a 24-hour basis. Since the average storm duration is about 11 to 14 hours (Stenstrom and Strecker,1993: Assessment of Storm Drainage Sources of Contaminants to Santa Monica Bay, Volume I), this type of analysis would tend to truncate actual rain events, potentially leading to the conclusion that more stormwater would be treated than might really occur. Third, we do not believe that the use of raingage analysis alone is appropriate for setting standards. What should occur is the use of rainfall runoff models to assess other factors that can affect the performance of BMPs.

The use of a design storm (depth of rainfall) is appropriate for BMPs where the dominant treatment mechanism is resulting either directly or indirectly from storage. It is not appropriate for BMPs which are "flow-through" such a swales, filters, and infiltration. The performance of these BMPs in terms of treatment of a certain volume of runoff is much better evaluated through the investigation of rainfall intensities rather than a rainfall depth over a long time period. This could be done through the analysis of long-term hourly or, even better, 15-minute raingage data and then rainfall/runoff modeling.

The selection of design criteria should include an evaluation of actual site designs with assessment of effectiveness through the use of rainfall/runoff modeling and analysis of costs. This serves a number of important purposes. We believe than in many cases, there is the potential to save money and achieve better water quality through good site designs. Much of the opposition that the Board is facing on this issue is the perception that imposed standards will impose economic hardships. We believe that producing a number

of site examples as a part of the criteria selection work is critical to gaining the support and approval of both the municipalities and developers, as well as the public and the environmental community.

There is a need from both a technical perspective as well as a community acceptance perspective to conduct additional technical analyses as well as cost-effectiveness evaluations. This should be done with a broad group of stakeholders to help select and implement a criteria that will be accepted and successful. Playa Vista supports the efforts to develop such a standard and would be pleased to provide more detailed input on this manner. If you should have any questions, please contact Catherine Tyrrell, Environmental Affairs Director at (310) 448-4676.

Sincerely,

David A. Herbst
Vice President
Corporate Affairs

cc: Sara Wan
Peter Douglas

David B. Placek, P.E.
24591 Via San Fernando
Mission Viejo, CA 92692
714/751-7373 x2150

September 14, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

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Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

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that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction) in Los Angeles County, I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

David B. Placek, P.E.

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

PSOMAS

3187 Red Hill Avenue Suite 250 Costa Mesa, CA 92626 714.751.7373 714.545.8883 Fax www.psomas.com

Facsimile

To Regional Water Quality Control Board Date 9-14-99

Company Time

Fax (213) 576-6660 Phone

From Sam Ali Pages 1 + cover = 2

Subject Standard Urban Storm Water Mitigation

Remarks

If you have any questions concerning this fax, please contact Sam Ali at 714.751.7373.

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September 14, 1999

Information and Engineering Solutions

Mr. Dennis A. Dickerson, Executive Officer
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Subject: Standard Urban Storm Water Mitigation

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Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input form the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

PSOMAS

Sam Ali, P.E.
Senior Project Manager

Cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, LA Region

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Costa Mesa, CA 92626

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714.545.8883 Fax
www.psomas.com

R0070030

RAMSEYER AND ASSOCIATES, INC.

• CIVIL ENGINEERS • LAND PLANNERS • SURVEYORS •

September 14, 1999

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California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

LOS ANGELES REGION

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1881 KNOLL DRIVE, VENTURA, CALIFORNIA 93003 TELEPHONE: (805)654-1088 FAX: (805) 654-8013

TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

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As a Los Angles area businessperson involved in the design of residential and commercial projects, I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

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Once again, I would like to ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

RAMSYER AND ASSOCIATES, INC.

Randy Toedter, V.P.
Registered Civil Engineer 37316

Cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Board, Los Angeles Region

W.O. 999
L:\doc-off\Randy\BMP.doc

JAMES S. RASMUSSEN

September 13, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

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Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

James S. Rasmussen
President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

26500 W.Agoura Rd.,PMB 652, Calabasas, CA 91302-1952
(805) 370-0075; Fax (805) 370-0165

JAMES S. RASMUSSEN

September 13, 1999

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California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

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Sincerely,

James S. Rasmussen
President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

26500 W.Agoura Rd.,PMB 652, Calabasas, CA 91302-1952
(805) 370-0075; Fax (805) 370-0165

R0070035

REX B. LINK & ASSOCIATES
CONSULTANTS IN PARKING - PLANNING • STRUCTURES • LOTS • CODE PROBLEMS

REX B. LINK

3950 LOS FELIZ BLVD. #116
LOS ANGELES, CA 90027
TELEPHONE: (213) 936-6218
STUDIO: (213) 662-7403

(3251

Xavier

Pls ensure that all commentors at the hearing get a copy of the approved SUSMP

Add above to this list Thanks

Doni

R0070036

RFC

January 24, 2000

California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County. Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Maury Froman
President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070037

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CLEAN WATER INITIATIVE

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation, which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments
The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

We commit to clean water
We commit to implementing quality Best Management Practices (BMPs)
We commit to doing demonstration projects and pilot programs on specific BMPs
We commit to developing watershed management plans for each watershed in the Basin
We commit to work cooperatively with all of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations
While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

Water Quality Analysis
Waste Load Analysis
Cost Effectiveness Analysis

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

The Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.

The Board monitor pilot programs similar to those underway in Los Angeles County.

The Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.

The Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.

The Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.

The Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.

The Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.

The Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.

The Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.

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December 22, 1999

Via Facsimile and U.S. Mail

Mr. Dennis A. Dickerson
Executive Officer
California Regional
Water Quality Control Board
320 W 4th Street, Suite 200
Los Angeles, CA 90013

Re: **Objections to Proposed Regional Board Action regarding Standard Urban Storm Water Mitigation Plans (SUSMPs) - Order No. 96-054**

Dear Mr. Dickerson:

This letter is being forwarded to you on behalf of the Executive Advisory Committee of the Storm Water Program for Los Angeles County, Los Angeles County Municipal NPDES Permit (No. CAS614001), Waste Discharge Requirements, Order No. 96-054, ("Permit/WDRs" or "Order") and the Permittees thereunder, in connection with the upcoming hearing before the Regional Board scheduled for January 26, 2000. Please have these comments entered into the Administrative Record for this item before the Regional Board.

The proposed action recommended to be taken by the Regional Board on January 26, 2000, cannot legally be taken as: (1) the Regional Board's proposed action ignores the "Administrative Review Process" mandated by the Permit/WDRs; (2) the Regional Board cannot ***legally*** require that numerical mitigation measures be incorporated into the existing Permit/WDRs without formally amending the Permit/WDRs; (3) pursuant to the Permit WDRs and state law, only cost effective storm water pollution control measures can be recommended; (4) the proposed mandated SUSMP Program would result in the imposition of unfunded mandates in violation of the California Constitution; and (5) the imposition of the mandated SUSMP by the Regional Board would result in a violation of the Administrative Procedures Act under California law. For these reasons and others, as further explained below, the Regional Board has no legal authority to take the action that is recommended for the January 26, 2000 hearing.

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A. BACKGROUND.

On July 27, 1999, the Los Angeles County Department of Public Works submitted to you, on behalf of the Permittees under the subject Permit/WDRs, a Standard Urban Storm Water Mitigation Plan ("SUSMP") for your review and approval as the Executive Officer of the Regional Board. The SUSMP was then resubmitted on August 12, 1999, by the County, in order to clarify portions of the text. Pursuant to your recommendation, on September 16, 1999, the Regional Board considered making a recommendation back to you, that you approve the SUSMPs, with certain ***mandated*** modifications. The Regional Board, however, took no formal action at that time, and determined to continue the matter for approximately 90 days with a new hearing to be renoticed. That hearing has now been noticed for January 26, 2000.

The County's proposed SUSMP was submitted to you as the Executive Officer, in accordance with the Permit/WDRs for your review and approval. Pursuant to Section 2.III.A of the Order, the Principal Permittee, in consultation with the other Permittees, was to develop the SUSMP and guidelines for their preparation, for use during planning and permitting of all development projects requiring "discretionary approval." Under the terms of the Order, the SUSMP is to incorporate the appropriate elements of the recommended list of BMPs, a list which has already been submitted to the Regional Board and approved by Resolution No. 99-03, dated April 22, 1999.

Under Resolution No. 99-03, the Regional Board specifically found that the approved BMPs ***"when implemented at development projects, in combination, will reduce pollutants in storm water discharges to the 'maximum extent practicable'."*** Thus, the Board has already determined that the proposed and approved BMPs when implemented, meet the Permittees requirements under the Clean Water Act. (Section 33 USC § 1342(p)(3)(B).)

The Permit/WDRs requires each Permittee to "develop a program on planning control measures" ("Planning Program") for priority projects (discretionary projects which may have a potential significant effect on storm water quality) ***"consistent with the programs developed under Part 2.III.A.1.b & c"*** (i.e., the approved list of BMPs and the SUSMP). The Planning Program is to be implemented within six months after commencement of the next fiscal year following approval of the Model SUSMP by the Executive Officer, provided that such approval was issued not later than 90 days prior to commencement of the Permittee's fiscal year. Where the approval is given within 90 days of the commencement of the fiscal year, the program is to be implemented in the second fiscal year following approval, but in no event is implementation to be initiated later than July 30, 1999.[1]

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[1] Unfortunately, because of delays in the review process of a number of model programs by Regional Board staff, the July 30, 1999 deadline has not been complied with. Nevertheless, the

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B. THE REGIONAL BOARD'S PROPOSED ACTION IGNORES THE "ADMINISTRATIVE REVIEW PROCESS" MANDATED BY ORDER 96-054.

The Permit/WDRs contains various provisions outlining the Administrative Review Process required to be followed by the Regional Board and the Executive Officer in reviewing storm water programs to be developed under the Order. Unfortunately, the process that is being proposed for the SUSMP, i.e., a referral to the Regional Board, and thereafter a recommendation and/or an approval of a storm water program with ***mandated*** changes, is ***not*** a procedure that is contained anywhere in the Order. To the contrary, Section 2.I.G. of the Permit/WDRs identifies the Administrative Review Procedure that must be followed "for review and acceptance of reports and documents submitted to the Regional Board under this Order." It further provides for a method ***"to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action."*** (Order No. 96-054, §2.I.G.)

Section 2.I.G.2 provides that if the Executive Officer determines the Permittees' Storm Water Program is insufficient to meet the requirements of the Order, the Executive Officer is to send a "Notice of Intent to Meet and Confer" ("NIMC") to the Permittees, with specific information to support the determination. The NIMC is to include a time frame by which the Permittee must meet with the Regional Board staff in order for the Permittee to demonstrate that ***its program*** is sufficient to meet the requirement of the Order, and if not, to seek clarification of the steps to be taken to comply with the provisions of the Order. Please recognize that under the plain language of the Order, it is the ***Permittees' program*** that must be sufficient to comply with the Order, ***not the Regional Board's program***, or anyone else's.

Under Subsection 2.I.G.2, the NIMC is to conclude with either a Notice of Program Sufficiency to the Permittee, or the submittal of an acceptance by the Executive Officer of a written "Storm Water Program Compliance Agreement" ("SPCA") which is to include implementation deadlines.

You, as the Executive Officer, are empowered to terminate the meet and confer process after a reasonable period of time, due to a lack of progress on issues, and you may further order submittal of the SPCA by a specified date. You must then either approve or reject the submitted SPCA within 120 days of its submittal. If you reject the SPCA, you are required by the

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Permit/WDRs presumes a minimum of six (6) months lead time after commencement of the next fiscal year, before implementation of the approved SUSMP, given the need to incorporate the SUSMP into the various Permittees planning processes, including allowing the Permittees sufficient time to develop storm water management guidelines for use in preparing and reviewing CEQA documentation. Thus, any approval of the SUSMP, and acceptance of the same by the Permittees, should not require implementation until six (6) months after commencement of the following fiscal year.

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Permit/WDRs to state the reasons for your failure to approve the SPCA. If an SPCA has been rejected, the Permittees have 60 days in which to remedy the specified deficiency and resubmit the SPCA. If the SPCA has been approved, the Permittees are to comply with the terms of the SPCA.

Finally, as the Executive Officer, you are not to take any enforcement action against the Permittees until the Permittees have been notified in writing that the ***"Administrative Review Process has been exhausted, and that the Executive Officer has determined that a violation exists warranting enforcement."*** (Order No. 96-054, §2.I.G.2.d).

Please recognize that under the Administrative Review Process, it is the ***"Permittees' program"*** that is to be reviewed, and the standard of review is ***not*** whether the Regional Board recommended program is sufficient, but rather whether the ***"Permittees' program"*** is sufficient. Thus, the Regional Board's focus then and now should not and cannot be on whether ***its*** proposed program which contains numerical mitigation measures is consistent with the Clean Water Act. Rather, the focus, by law, must be on whether the SUSMP submitted by the Permittees is sufficient.

As discussed above, the SUSMP was resubmitted to your office for review and approval on August 12, 1999. Under the Administrative Review Process, the Executive Officer is to notify the Permittees of "the results of the review and approval or disapproval within 120 days." (Order No. 96-054, 2.I.G.1.a) If you determine that the submitted SUSMP is unacceptable, you must issue a Notice of Disapproval and thereafter comply with the NLMC procedures set forth above to resolve the alleged deficiencies.

Please recognize that there is no procedure under the Permit/WDRs for the Executive Officer or the Regional Board to unilaterally modify the proposed storm water program. Nor is there any procedure for the Regional Board to recommend to the Executive Officer that the Executive Officer approve someone else's program, in place of and instead of the Permittees' program. Rather, the existing Permit/WDRs provides a very specific procedure to be followed in the event you cannot approve the program submitted.

At this time, the Executive Advisory Committee requests that you follow the Administrative Review Procedures set forth under the Order issued by the Board. The procedure plainly applies to any deficiency alleged with respect to the Permittees' SUSMP and must be complied with.

In the event the Regional Board chooses to ignore the Administrative Review Procedure ***required*** by the Permit/WDRs, and the submitted SUSMP is not simply approved or disapproved by your office, such action will be interpreted by the Permittees as being a disapproval of the Permittees' SUSMP program. At that point, in accordance with the Order, we presume your

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office will then proceed and issue a Notice of Intent to Meet and Confer with the Permittees and that you will simultaneously provide the required specific information called for under the Permit/WDRs to support such a determination, i.e., you will identify how the ***Permittees' program*** is deficient.

Once the NIMC is submitted and the members of the Executive Advisory Committee have had an opportunity to review the "specific information in support" of your determination, it will then comply with the procedures set forth under Order No. 96-054 "to resolve any differences in compliance expectations between the Regional Board and Permittees . . . ." (Order No. 96-054, 2.I.G.) It is the Permittees' expectation that your office and the Regional Board will follow the requirements of the Order in attempting to resolve any differences in compliance expectations. (Id.)

C. NUMERICAL MITIGATION MEASURES, EVEN IF JUSTIFIED, CANNOT BE MANDATED UNDER THE PRESENT ORDER.

In response to comments requesting the authority for imposing numerical mitigation measures on the Permittees, Regional Board staff cited the federal regulations, specifically Part 40 CFR Section 122.26(b)(2)(iv)(A)(2) as its justification for imposing such mitigation measures ***at this time***. A review of Section 122.26(b), shows in very clear terms that this Section concerns proposed programs to be considered by the Director, ***"when developing permit conditions"*** to reduce pollutants and discharges to the maximum extent practicable. See 40 CFR 122.26(d)(2). This Section, entitled "Proposed Management Program," reads in pertinent part as follows:

> "A Proposed Management Program covers the duration of the Permit . . . . Proposed Programs will be considered by the Director ***when developing permit conditions*** to reduce pollutants and discharges to the maximum extent practicable. (40 CFR 122.26(b)(2)) (vi.)

Thus, the authority specifically relied upon by Regional Board staff as the basis for its legal authority to impose numerical mitigation measures, in and of itself, shows that numerical mitigation measures can only be imposed ***"when developing permit conditions."*** Because the proposed numerical mitigation measures are not "permit conditions," but rather would only be conditions imposed on the approval of a program, under the Permit/WDRs, they can only appropriately be reviewed and imposed by the Regional Board pursuant to the issuance or reissuance of an MS4 NPDES Permit.

Further evidence of this fact is supported by the case so heavily relied upon by Regional Board staff in its response to comments, i.e., Defenders of Wildlife, et al. v. Browner, 1999 Daily Journal, DAR 12369 (Case No. 98-71080, filed September 15, 1999). In Defenders of Wildlife

v. Browner, the imposition of ***numerical*** limitations was being considered in the context of the appropriateness of the issuance of "***final*** NPDES Permits" to the Cities of Tempe, Tucson, Mesa and Phoenix, Arizona and Pima County. The "discretion" of the EPA Administrator in that action concerned the issuance of numerical limitations only in the course of the issuance of the ***final*** Permit/WDRs

In short, there is absolutely no support in state or federal law for the Regional Board or the Executive Officer to ***mandate*** a program on the Permittees at this juncture without it first being included in the NPDES Permit/WDRs issued in July of 1996. Thus, any attempt to do so by the Regional Board is subject to legal challenge. Since the requirements in question are nowhere to be found in the Permit/WDRs, ***they cannot be mandated*** on the Permittees under the Order, and just as the Permittees are forced to comply with the requirements of the Permit/WDRs as issued by this Regional Board in July of 1996, so to must the Regional Board.

Further, as discussed above, the Regional Board, through Resolution No. 99-03, has already found that the approved BMPs when implemented "will reduce pollutants in storm water to the maximum extent practicable," i.e., ***the Regional Board has already found that the previous approved list of BMPs complies with the Clean Water Act.*** Any attempt to impose additional conditions under the Order, would be inconsistent with the Clean Water Act and the regulations thereunder, and would be directly contrary to findings already made by your Board.

D. ONLY "COST-EFFECTIVE" STORM WATER POLLUTION CONTROL MEASURES SHOULD BE RECOMMENDED.

In addition, Section 2.III.A.4. of the Permit/WDRs, provides that the Principal Permittee in consultation with the Permittees, is to develop a model program to inform developers seeking "discretionary approvals" (such as the approvals needed where Urban Storm Water Mitigation Plans are to be incorporated in the development process), of, among other things: (1) "Development and construction of storm water management;" (2) "Maximization of pervious areas and storm water infiltration (where geology and topography permit);" and (3) ***"cost effective storm water pollution control measures."*** The informational program to be developed must also include specific guidance on selecting BMPs to reduce pollutants in storm water discharges from urbanized areas, and to include appropriate BMPs, educational materials, and handbooks and guidelines as described in the Permit/WDRs. This informational program was developed and incorporated into the Development Planning Model Program submitted to you in January of 1998, and as discussed above, the Development BMPs were ***approved*** by the Board under Resolution No. 99-03.

The Development Planning Model Program incorporates the requisite BMPs, but neither the approved BMPs, nor the Development Planning Model Program, requires numerical mitigation measures. Furthermore, numerical mitigation measures are not mentioned anywhere

in the Permit/WDRs. Accordingly, the approved model program, which is required to include information to developers on ***"cost effective storm water pollution control measures"*** does not include any information on numerical mitigation measures. The Permit/WDRs requirement for Developers to be informed of ***"cost effective storm water pollution control measures"*** is evidence of the Permit's/WDRs' requirement that any "storm water pollution control measures" to be implemented must be "cost effective" before being imposed on Developers.

In the present case with respect to the proposed numerical mitigation measures, as evidenced from responses to comments issued by Regional Board staff, the Regional Board has performed very little analysis on the ***cost effectiveness*** of the proposed numerical mitigation measures. Without such an analysis, the recommended numerical mitigation measures should not even be considered, let alone recommended.

The required cost/benefit analysis is, moreover, mandated by state law. Specifically, California Water Code Section 13225 allows the Regional Board to require as necessary "any state or local agency to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water; ***provided that the burden, including costs, of such reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained therefrom.***" (Cal. Water Code § 13225(c).)

Given that the Permit/WDRs is not only a permit issued pursuant to the Clean Water Act, but also pursuant to the Porter-Cologne Act, (as evidenced by its caption "Waste Discharge Requirements)" state law and the Order itself mandate a costs benefit analysis before requiring such a costly program

E. THE PROPOSED MANDATED PROGRAM WOULD RESULT IN THE IMPOSITION OF AN UNFUNDED MANDATE IN VIOLATION OF THE CALIFORNIA CONSTITUTION.

In response to comments, Regional Board staff has contended that the imposition of a numerical mitigation measures is not an unfunded mandate because it involves the implementation of a federal permit. Yet, in the Ninth Circuit's decision of Defenders of Wildlife v. Browner, again a case heavily relied upon by Regional Board staff in its comments, the Ninth Circuit found that the imposition of numerical limits in the course of the issuance of a final NPDES Permit/WDRs was a "discretionary" decision of the Administrator. Similarly, Regional Board staff claims that it has the "discretion" to impose numerical mitigation measures.

Under the California Constitution, specifically Article XIII B, Section 6, a state agency is prohibited from shifting the financial responsibility of carrying out governmental functions to local entities, unless it also includes a provision reimbursing local governments for the cost of such programs. Here, with respect to the proposed mandated program by the Regional Board,

the Regional Board has provided no funding mechanism to local governments to implement the proposed program.

The prohibition on unfunded mandates applies even where federal law is involved, unless the state "has no true choice" in the manner of implementing the federal program. (See Hayes v. Commission on State Mandates (1992) 11 Cal.App.4th 1564, 1593). In fact, in Hayes, the Court made it clear that the ***state*** had to fund its requirements/mandates when the manner of implementing the federal program was left to the "discretion" of the state. (Id. at 1593.)

In the present case, Regional Board staff has claimed the Board has the "discretion" to impose numerical mitigation measures and thus, because it is not mandated to do so, the imposition of such a program on local agencies is an unfunded mandate in violation of the California Constitution.

F. THE IMPOSITION OF THE REGIONAL BOARD'S SUSMP PROGRAM ON THE PERMITTEES IS A VIOLATION OF THE ADMINISTRATIVE PROCEDURES ACT.

The California Administrative Procedures Act, Government Code Sections 11340 et. seq. ("APA") was enacted to establish basic minimum procedural requirements for the adoption, amendment or repeal of administrative regulations promulgated by the state's many administrative agencies. (Grier v. Kizer (1990) 219 Cal.App.3rd 422, 431; also see, Gov. Code § 11346.) Although California law does not require administrative agencies to comply with the APA when simply issuing or amending permits, including the issuance of waste discharge requirements, where the permit or amendment in question rises to a level of an ***order***, a regulation or a ***standard of general application***, the APA clearly applies. (Gov. Code §11342(g).)

In the instant case, the proposed action by the Regional Board, if carried out by the Executive Officer and forced on the Permittees under the present Permit/WDRs, constitutes an ***order and a standard of general application*** that is being imposed on all Permittees, i.e., all eighty-five (85) cities in the County and the County itself, to require the imposition of numerical mitigation measurers on significant development and redevelopment in the County. As such, if it determines to move forward with the imposition of such a mandated standard of general application, the Regional Board is required to comply with the APA.

In State Water Resources Control Bd. v. Office of Admin. Law (1993) 12 Cal.App.4th 697, the court analyzed various amendments to a Water Quality Control Plan and found that such amendments constituted "regulations" required to be adopted in compliance with the APA. The court found that where a regulation "looks like a regulation, reads like a regulation, and acts like a regulation, it will be treated as a regulation whether or not the agency in question so labeled it."

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(Id. at 702) The court went on to find that in light of this strong legislative mandate, regulatory agency directives, such as amendments to the Water Quality Control Plan, must be deemed to be regulations. (Id.)

In the instant case, a mandated SUSMP, where the Permit/WDRs in question does not allow for the compulsion of such a program or the compulsion of ***any*** program, is plainly a "regulation" for purposes of the APA Since the requirements of the APA have not been complied with, any such mandated program would have no legal force or effect.

G. CONCLUSION.

In sum, the Executive Advisory Committee respectfully requests that the Regional Board recognize that it has already issued an NPDES Permit/WDRs which allows the Permittees to discharge both storm water and non-storm water into their MS4 systems. Moreover, the existing Permit/WDRs does not require or condition its terms on the imposition of numerical mitigation measures. Nor does the existing Order allow the Executive Officer to unilaterally impose new conditions on the Permittees. Such action, if taken, would be taken in violation of the existing Order.

At this time, the only action the Executive Officer is permitted to take in accordance with the terms of the Order, is to review the Permittees' proposed SUSMP, provide an explanation as to why that program is insufficient, and to thereafter comply with the Administrative Review Process under the Order. Any action taken by the Executive Officer to approve a program not submitted by the Permittees, will have no legal force or effect. We respectfully request that you comply with the terms of the Order issued by your own Regional Board in reviewing and approving the SUSMP submitted by the Permittees.

Thank you for your attention to this matter and your consideration of these issues.

Sincerely,

Richard Montevideo

cc: Mr. Desi Alvarez, Chairman, Executive Advisory Committee

SheaHomes

January 25, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Via Facsimile: 213-576-6625

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Shea Homes Southern California

Les Thomas
President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070049

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Los Angeles/Ventura Area Office

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

As a Southern California resident and home building professional, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from stormwater run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Board's efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams, wetlands, bays and the ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that has made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definition for "Hillsides," "Parking Lots," and "Environmental Sensitive Areas" have been dramatically changed since the September 16, 1999 Board hearing. These new definitions have not been discussed yet in a public hearing or with the regulated communities.

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Definition of Hillsides

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, we suggest that the Board modify the definition as property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent

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or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county).

Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input for the municipalities, the regulated communities or interested parties. It is unclear why and how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not parking lots that are not associated with small commercial developments.

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a

commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,
SHEA HOMES

John Franklin
Vice President/Regional Manager

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070052

Shea

Shea Homes

555 Saint Charles Dr., Suite 205
Thousand Oaks, CA 91360
Phone: (805) 557-2100
Fax: (805) 557-2139

Fax Transmittal

To: Dennis A. Dickerson From: John Franklin

Company: Water Quality Date: 9/15/99

Fax #: (213) 576-6660 Pages: 3

Re: Standard Urban Storm Water Mitigation cc:

R0070053

SheaHomes

Los Angeles/Ventura Area Office

September 13, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson involved in the construction industry, I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall events at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be significantly impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

R0070054

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take, not add, numerical mitigation measures when you approve the SUSMPs.

Sincerely,
SHEA HOMES

John Franklin

John Franklin,
Vice President/Regional Manager

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070055

Shea

Shea Homes

555 Saint Charles Dr., Suite 205
Thousand Oaks, CA 91360
Phone: (805) 557-2100
Fax: (805) 557-2139

Fax Transmittal

To: Dennis A. Dickerson From: Tak Fujii

Company: Water Quality Date: 9/15/99

Fax #: (213) 576-6660 Pages: 3

Re: Standard Urban Storm water Mitigation cc:

R0070056

SheaHomes

September 13, 1999 *Los Angeles/Ventura Area Office*

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to

R0070057

protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,
SHEA HOMES

Tak Fujii

Tak Fujii
Director of Community Development

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070058

Shea

VIA FAX NO. (213) 576-6660

SIKAND

Engineering
Planning
Surveying

15230 Burbank Blvd., Suite 100
Van Nuys, CA 91411-3586

Tel: 818/787-8550
Fax: 818/901-7451
E-mail: info@sikand.com

September 14, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Reference: **STANDARD URBAN STORM WATER MITIGATION**

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternative cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treated controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentages of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

R0070059

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area Practicing Civil Engineer involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Sikand Engineering Associates

Gunjit S. Sikand

GSS:ss

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070060

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September 13, 1999

SIKAND

Engineering
Planning
Surveying

15230 Burbank Blvd., Suite 100
Van Nuys, CA 91411-3585

Tel: 818/787-8560
Fax: 818/901-7451
E-mail: info@sikand.com

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

Subject: **STANDARD URBAN STORM WATER MITIGATION**

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall even at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

SIKAND ENGINEERING ASSOCIATES

Dean Paradise, P.E.
Project Manager

R0070061

Southern California Contractors Association, Inc.

6055 E. Washington Blvd., Suite 200
(323) 726-3511

Los Angeles, California 90040
FAX: (323) 726-2366

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DOYLE WOODS
MARK WOOLARD

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EDWIN M. KALISH	1974
LEONARD BRUTOCAO	1975
LEE VOLLMER	1976
CHARLES W. POSS	1977
DON THOMPSON*	1978
JACK SAIZ, JR.	1979
JOHN J. CLARKE	1980
DONALD GLADDEN	1981
BILL MANESS*	1982
TIM MACDONALD	1983
ARNOLD S. NELSON	1984
DAN GRANDPRE	1985
DONALD L. MCCOY	1986
JAMES D. SPRINKEL	1987
GEORGE B. COOKE	1988
LEROY MCAFEE	1989
JON SALATA	1990
JAMES T. GASPARO	1991
DEAN RASMUSSEN	1992
LES FARROW	1993
STAN HOWARD	1994
DOUG BURROS	1995
JACK BLAKELY	1996
GERRI ERICKSON	1997
JIM O'KANE	1998
BRAD COOKE	1999

*DECEASED

STAFF
JIM BURTON
EXECUTIVE VICE PRESIDENT
A. H. 'AL' ATWOOD
EXEC. VICE PRES. EMERITUS
JERE MEACHAM
LABOR RELATIONS

Mobile Crane Operators Group, Inc.

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is our understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054).

The Southern California Contractors Association supports the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, we are opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, we are concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for SCCA to support the proposed SUSMP.

Once again, we reiterate that we fully support the goal of cleaning our stormwater run off. That is why we support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, we respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

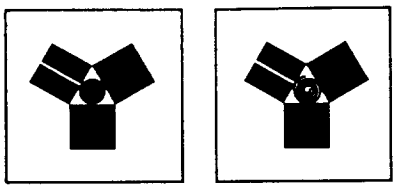
James F. Button
Executive Vice President

R0070062

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

Southern California Rock Products Association

Southern California Ready Mixed Concrete Association



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2000 JAN 26 P 2:11
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Re: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board – Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Therefore, I respectfully request that you and the Board delete the language of the implementation of numerical mitigation standards.

Thank you for your cooperation.

Respectfully submitted,

Stephen L. Bledsoe
President

P.O. Box 40, South Pasadena, California 91031
Tel: (626) 441-3107 Fax: (626) 441-0649

R0070063

Southern California Rock Products Association

Southern California Ready Mixed Concrete Association

LOS ANGELES REGION

September 15, 1999

Mr Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Re: Standard Urban Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternative cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure by required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the Country's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experience and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

R0070064

P.O. Box 40 ◆ South Pasadena, California 91031 ◆ Tel: (626) 441-3107 ◆ Fax: (626) 441-0649 ◆ E-mail: scrpa@greenheart.com ◆ Web Page: www.scrpa.com

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you do not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Stephen L. Bledsoe
SCRPA/SCRMCA
President

SLB/kkc

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board
Los Angeles Region

SOUTHPLACE CORPORATION
DEVELOPMENT
8136 Second Street • Second Floor • Downey, CA 90241 • (562) 904-3118

September 13, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

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I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to

R0070066

protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

Southplace Corporation
Mitch King, President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070067

STAINLESS
INDUSTRIAL COMPANIES
ANTHONY N. PRITZKER
President & CEO

2000 JAN 13 P 1:44

CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

12 January 2000

Mr. Dennis Dickerson
Executive Director
Los Angeles Regional Water Quality Control Board
320 W. 4th Street #200
Los Angeles, CA 90013

RE: Support for Three Quarter-Inch Standard to Reduce Runoff from New and Redevelopment

Dear Mr. Dickerson:

You have the opportunity to significantly reduce urban runoff, *the number one source of pollution to our coastal and inland waters.* On January 26,200, we urge you to adopt a Standard Urban Stormwater Mitigation Plan for the Cities in Los Angeles County that requires mitigation, by specified new and redevelopments, through treatment or infiltration, of 100% of the runoff generated by the first three quarters of an inch of rain, with no exceptions. By adopting this standard, you and the Regional Board have the opportunity to alter our current course towards worsening water pollution.

Today, approximately 50% of our rainfall is converted into runoff that builds in toxicity as it crosses parking lots, building sites, industrial sites, automotive repair garages, and gas stations before it is channeled and runs untreated into the ocean. With the most infamous urban runoff problem in the nation, and few measurable requirements in the municipal storm water permits, we have countless beaches that are frequently unsafe for swimming; creeks and streams with water that is unsafe to drink; and inland and coastal waters that pose health risks to aquatic life.

The three quarter-inch standard also makes economic sense. First, reducing storm water pollution in the planning phase of construction is the most cost-effective way to solve the runoff problem. Second, urban runoff is bad for our regional economy. Los Angeles County coastal tourism and recreation businesses generate over two billion dollars to attract their customers. As the health of the coastline declines, so does business (just ask any businessperson near Huntington Beach) - and with billions of dollars at stake, the health of our entire regional economy is impacted.

In a region that is constantly being built and rebuilt, adoption of the three quarter-inch standard will soon have a transformative impact on the amount of polluted runoff that invades our streams, rivers, and coastal waters. For the health of local aquatic life, for the health of the 60 million people who visit Los Angeles County beaches annually, for the health of our regional economy, and for a more livable Los Angeles, please adopt the three quarter-inch standard, with no exception, to mitigate the effects of urban runoff from new and redevelopment.

Sincerely,

Anthony N. Pritzker

R0070068

11111 SANTA MONICA BLVD. SUITE 1120 LOS ANGELES. CA. 90025
TEL. 310.575.0023 · FAX 310.575.9882 · TONYPRITZ@AOL.COM

SunCal Companies

January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Broad
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

As a Southern California resident and home building professional, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from stormwater run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Boards efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to lour local rivers, streams, wetlands, bays and ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that has made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definition for "Hillsides," "Parking Lots," and "Environmental Sensitive Areas" have been dramatically changed since the September 16, 1999 Board hearing. These new definitions have not been discussed yet in a public hearing or with the regulated communities.

[redacted]

Definition of Hillsides

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, we suggest that the Board to modify the definition as property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county).

Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input for the municipalities, the regulated communities or interested parties. It is unclear why and how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not Parking lots that are not associated with small commercial developments.

Environmentally Sensitive Areas

Once again, staff added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution cased by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based job sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

Ben C. Anderson
Senior Vice President
SunCal Companies

Cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070071

11-355

January 21, 2000

SunCal Companies
Los Angeles/Ventura Division

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

As a Southern California resident and home building professional, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from stormwater run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Boards efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams, wetlands, bays and the ocean.

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At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Very truly yours;

William R. Rattazzi
Principal
SunCal Companies

cc: Mr. Hami Nahani, Chair
California Regional Water Quality Control Board, Los Angeles Region

SunCal Companies

Los Angeles / Ventura Region
21601 Devonshire Boulevard, Suite 116
Chatsworth, CA 91311
(818) 772-2077 / (818) 772-2067 fax

FACSIMILE TRANSMISSION SHEET

TO: Mr. Dennis Dickerson

FAX #: 213-576-6660

FROM: William Battazzi

DATE: 9-15-99

 # OF PAGES: 2
(including cover sheet)

Comments:

Re: Regional Board meeting 9/16/99.

cc: file

R0070075

SunCal Companies
Los Angeles/Ventura Division

September 15, 1999

Mr. Dennis A Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall events at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon all business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you take not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

William R. Rattazzi
Principal
SunCal Companies

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070076

21041 Devonshire Blvd. Suite 110 Chatsworth CA 91311
818 [illegible] Fax 818 [illegible]



Taylor Woodrow
Homes, Inc.
24461 Ridge Route Drive
Laguna Hills, CA 92653-1686
Telephone 714 581-2626
Facsimile 714 581-2727

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask

that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

TAYLOR WOODROW HOMES, INC.
Rick Bianchi
Development Manager

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region



Taylor Woodrow
Homes, Inc.
24461 Ridge Route Drive
Laguna Hills, CA 92653-1686
Telephone 714 581-2626
Facsimile 714 581-2727

September 13, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage

of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,
Taylor Woodrow Homes, Inc.

Rick Bianchi
Development Manager

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070081

TETRA TECH, INC.
INFRASTRUCTURE SOUTHWEST GROUP
600 City Parkway West, Suite 300, Orange, California 92868-2907
(714) 456-0166 • FAX (714) 456-0161
Formerly
Simons, Li & Associates, Inc.
AWA Engineers, Inc.
RJO Engineering, Inc.
CDC Engineering, Inc.

September 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

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I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area civil engineer involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,



François Zugmeyer, P.E.
Senior Engineer

Tetra Tech, Inc. Infrastructure Southwest Group

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

9-2-99

September 1, 1999

LOS ANGELES REGION

Xavier Swamikannu
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Transmitted via fax on 9-2-99 to (213) 576-6660 (original mailed 9-2-99)

Subject: **Consideration of Standard Urban Storm Water Mitigation Plans**

Dear Mr. Swamikanna:

Erosion Controls

As a consulting civil engineer with over 20 years experience in southern California, I have witnessed the increasing controls and regulations related to storm water quality. Approximately 15 years ago, the requirement of erosion controls within construction sites was introduced. Within 5 years, nearly every construction project was required to implement erosion control measures during construction. As you are aware, this requirement remains in effect...at increased design and construction costs to **both** public and private projects.

Non Structural BMP's

In recent years, various Federal and State agencies have concluded that erosion control devices and systems may not be adequate since they are generally removed when the contractor leaves the site. Hence, both public and private facilities and roadways are now required to implement Best Management Practices (BMPs) during construction and after construction.

Since 1995, Truxaw & Associates has prepared more than 200 grading plans throughout southern California, including more than 30 in the County of Los Angeles. Although the storm water guidelines vary from agency to agency, every Water Quality Management (WQMP) and Storm Water Pollution Prevention Plan (SWPPP) prepared by this office includes sections on Structural BMPs *as well as* Non-Structural BMPs. Non-structural BMPs include employee education materials, storage methods and other guidelines to encourage property owners and tenants to prevent pollutants from entering the storm drain system. It has been our experience that the key to the storm water pollution issue is public awareness and compliance ...not numerous structural BMPs such as catch basin filters, detention ponds, etc. Our experience has been that most of the structural BMPs are not routinely maintained and become more of a liability than a benefit.

721 N. Euclid St.
Suite 311
Anaheim, CA 92801
(714) 535-0135
(714) 535-8368

R0070084

Objections to additional regulations

Both private *and public* agencies have suffered significant financial hardships due to the increased regulations mandated during the past 15 years. Because these regulations have resulted in cleaner storm water runoff, additional measures are not necessary. **Please document this firm's opposition to the proposed Standard Urban Storm Water Mitigation Plan (SUSMP).** The additional construction (and land acquisition costs in the event a detention ponds is required) would not be warranted given the effectiveness of the current practices of erosion control measures and BMPs. Please feel free to contact my office if you have any questions.

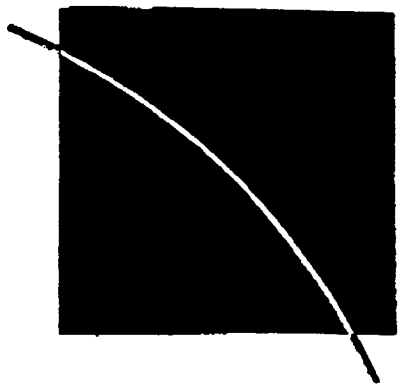
Sincerely,

JOSEPH C. TRUXAW & ASSOCIATES, INC.

William T Truxaw

William T. Truxaw, P.E.
Vice President

VAN TILBURG, BANVARD & SODERBERGH, AIA
ARCHITECTURE · PLANNING · INTERIORS



September 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: **Standard Urban Storm Water Mitigation**

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among these proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking any action that would implement numerical mitigation measures for BMP design criteria.

Given the significant information available, I believe that there is no compelling reason to move forward with these new regulations at this time. I urge you to not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Navy F. Banvard, AIA
Principal
Van Tilburg, Banvard & Soderbergh, AIA

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board
Los Angeles Region

PRINCIPALS
Johannes Van Tilburg, FAIA
L. Gustaf Soderbergh, AIA
Navy F. Banvard, AIA

PARTNERS
Lucia H. Chang, AIA
William A. Nishita, AIA
Michael I. Ohara, AIA

ASSOCIATES
Peter J. Petraglia
Edward "Ted" Youngs, AIA
Dennis T. DiBiase, AIA

R0070086

VENTURA AFFORDABLE HOMES, INC.

208 East Main Street
Ventura CA 93001
(805) 643-8269

January 26, 2000

Mr. Dennis Dickerson
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th St., Suite 200
Los Angeles, Ca. 90013
HAND DELIVERED

Dear Mr. Dickerson:

As President of the Building Industry Association of Greater Los Angeles/Ventura, and President of Ventura Affordable Homes, Inc., a provider of entry level housing to our local families, I applaud your efforts to improve our quality of life by reducing water pollution. However, another important component of quality of life, safe, decent affordable housing, may suffer as a result of some of the components of the revised SUSMP.

I urge you and the Board to support the "Clean Water Initiative", which I have provided you a copy of with my letter of January 20,2000. This Initiative provides a process which will achieve the Board's goals of reducing pollution at the same time it allows for collaboration of all affected parties in a cost-effective and scientific approach.

Using up our land, another precious resource, to reduce pollution without exploring other proven techniques merely pits one limited resource against another. We must use our limited resources efficiently to accomodate our diverse community interests.

Our quality of life includes decent housing, job opportunities, access to education, recreation, clean air and clean water. Comprehensive, collaborative planning with everyone at the table, as contained in the "Clean Water Initiative" is key to maintaining and improving the quality of life that California residents deserve.

People as well as buildings are part of our environment along with our State's natural resources. All of us must work together to protect our entire environment. Thank you for considering the "Clean Water Initiative", which provides the opportunity to improve California's environment.

Sincerely,

Lynn L. Jacobs
President
cc: Mr. Hamid Nahai, Chair

R0070087

VENTURA AFFORDABLE HOMES, INC.

208 East Main Street
Ventura CA 93001
(805) 643-8269

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

LYNN L. JACOBS
PRESIDENT

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070088

11-346

VTN West, Inc.
INEERS • ENGINEERS • SURVEYORS

6634 Valjean Avenue
Van Nuys, CA 91406
818/779-8740
FAX 818/779-8750
vtnwest@aol.com

January 20, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Stormwater Mitigation Plans (SUSMP) as required under the Los Angeles County Municipal Stormwater Permit (Order No. 96-054). As a Southern California businessperson I support the goals of clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area," and the addition of "Parking lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our stormwater run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outlined above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Very truly yours,

VTN WEST, INC.

Lloyd A. Poindexter
President

LAP:sjb

R0070089

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

11-346 389

☐ WARMINGTON HOMES
☐ WARMINGTON HOMES CALIFORNIA

FAX FAX FAX FAX FAX

DATE: 9-15-99

PLEASE DELIVER THE FOLLOWING MATERIAL AS SOON AS POSSIBLE

TO: DENNIS A. DICKERSON

FAX # 213 576-6660

FROM: JACK SCHWELLENBACH

TOTAL NUMBER OF PAGES (INCLUDING THIS PAGE) 2

PLEASE NOTIFY US IMMEDIATELY IF ALL PAGES ARE NOT RECEIVED!

COMMENTS:

THANK YOU !

29800 Agoura Road, Agoura Hills, California 91301 (818) 707-3100 FAX (818) 707-0913

R0070090

WARMINGTON HOMES

CALIFORNIA

September 14, 1999

Mr. Dennis A. Dickerson, Executive Officer
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

It is my understanding that during your September 16th meeting the Regional Board will hold a public hearing to discuss the proposed new Standard Urban Storm Water Mitigation Plans (SUSMP). This discussion will include staff proposed changes to the SUSMPs. Among proposed changes is a new and far-reaching requirement for numerical mitigation measures. As a Los Angeles area businessperson I am writing to request that you postpone taking andy action that would implement numerical mitigation measures for BMP design criteria.

The Los Angeles Region already has new stringent SUSMPs and there is no legislative or regulatory requirement to revise them to include numerical mitigation measures based on capture of a percentage of rainfall events at this time. In fact, the current SUSMPs are among the strictest in the nation and we are only now seeing the full environmental benefit derived from their implementation.

Considering this, as well as the potential economic impact numerical mitigation measure requirements may have upon business, it would only seem wise that you and the Board move slowly and cautiously when considering new and far reaching requirements. Further, as a businessperson who would be impacted by these new SUSMP requirements, I believe it is incumbent upon the Regional Board to seek vital input from the broader regulated community. It is my understanding that, except for one public workshop to present justification for the numerical measures, this has not yet taken place.

Once again, considering that there is no compelling requirement to move forward with these new regulations at this time, I would ask that you not add numerical mitigation measures when you approve the SUSMPs.

Sincerely,

Jack Schwellenbach
cc: Mr. Hamid Nahai, Chair, CRQWCB, Los Angeles Region

R0070091

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LOS ANGELES/VENTURA COUNTY DIVISION
310.665.0466 PHONE
310.216.7321 FAX

FACSIMILE TRANSMITTAL SHEET

TO: Dennis Dickerson	FROM: John Stanek
COMPANY: California Regional Water Quality Control Board	DATE: September 15, 1999
FAX NUMBER: 213.576.6660	TOTAL NO. OF PAGES INCLUDING COVER: Three (3)
PHONE NUMBER:	SENDER'S REFERENCE NUMBER:
RE: Standard Urban Storm Water Mitigation	YOUR REFERENCE NUMBER:

☑ URGENT ☑ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

6101 WEST CENTINELA AVENUE, SUITE 155
CULVER CITY, CALIFORNIA 90230

R0070092



September 15, 1999

Mr. Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Storm Water Mitigation

Dear Mr. Dickerson:

I am writing to comment on the revised Standard Urban Storm Water Mitigation Plans (SUSMPs), dated August 11, 1999, submitted to you by the County of Los Angeles. It is my understanding that after a discussion with the Regional Board during its September 16th meeting you are proposing to approve the SUSMPs for implementation with two modifications. I am concerned that among the staff proposed modifications is a new and far-reaching requirement for numerical mitigation measures.

Neither the August 16, 1999 Notice of Public Hearing nor your letter of September 8, 1999, tells us exactly what the staff is proposing. The public notice states that the "mitigation measure may be derived from" the two alternatives cited. The September 8 letter says you will recommend that "a numerical storm water mitigation measure be required for treatment controls."

The staff proposal summarized in the August 16, 1999 Notice of Public Hearing appears to go far beyond the numerical criteria the County of Los Angeles agreed to as part of a lawsuit Settlement Agreement. The staff proposal is "to capture a large percentage of runoff events, runoff volume and pollutant loads." Capturing the first 0.75 inches is far different from infiltrating and/or treating runoff generated by the first 0.75 inches of rainfall as required by the County's numerical mitigation measure. Furthermore, it is not clear what large percentage of pollutant loads will be captured. How do the pollutants that would be captured relate to beneficial uses in the receiving waters? What percentage of loads to the receiving waters that have been identified as impaired come from existing development and what percentage comes from new development?

I understand that some environmental groups are encouraging you to require the proposed numerical design criteria of all permittees. This would be inappropriate at this time. Together, we should examine the County's experience with numerical design criteria before the requirement is extended to cover the entire permitted area. It definitely should not be expanded from "infiltration and filtration" to "capture" before we have examined the experiences and consequences of implementing the measure that the County agreed to as a result of its Settlement Agreement. The scientific/technical basis for the selection of numerical design criteria is still unclear. It appears that the number has been arbitrarily chosen rather than derived from the need

6101 WEST CENTINELA AVENUE, SUITE 155, CULVER CITY, CA 90230 TEL 310.665.0466 FAX 310.216.7321

to control particular constituents in order to protect beneficial uses in the receiving waters. With the coming barrage of TMDLs, we should be focusing on expenditures and best management practices that respond directly to the identified impairments in the region's waters.

It should be noted that the Executive Advisory Committee of the Los Angeles County Stormwater Program has expressed its opposition to the inclusion of a numerical standard in the Standard Urban Storm Water Mitigation Plans. Their expressed reasoning is persuasive, and I agree with their observation that the imposition of this numeric standard without supporting evidence is poor public policy.

You already have before you a revised set of new stringent SUSMPs for approval. There is no legislative or regulatory requirement to revise them to include numerical mitigation measures based upon the capture of a percentage of each rainfall event at this time. In fact, the current SUSMPs are among the strictest in California and we need to see the full environmental benefit derived from their implementation before modifying them.

As a Los Angeles area businessperson involved in development (construction), I am requesting that you postpone taking any action that would broadly implement numerical mitigation measures for BMP design criteria. Considering the questionable technical basis for the proposed numerical mitigation measure requirement as well as the potential economic impact such a requirement might have upon business, it would seem prudent to move slowly and cautiously when considering new and far reaching requirements.

Furthermore, I request that you and your staff meet with municipal and industry representatives to further discuss the numerical mitigation measure and its potential consequences before you make your decision. There is no compelling requirement to add numerical mitigation measures at this time. In fact, you still have sufficient time in your 120-day approval window to delay approval of the SUSMPs while meeting with the regulated community.

Once again, I would ask that you not add numerical mitigation measures to the proposed SUSMPs at this time.

Sincerely,

WESTERN PACIFIC HOUSING, INC.

John D. Stanek
President, Los Angeles/Ventura County Division

JDS:krb
cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070094

WSPA
Western States Petroleum Association

August 30, 1999

Via Overnight Service

CALIF. REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

Dennis A. Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Dickerson:

PROPOSED LOS ANGELES COUNTY SUSMPs

The Western States Petroleum Association (WSPA) is a trade association representing over thirty companies engaged in all aspects of the petroleum business, including the refining and marketing of petroleum products. Many of our member companies operate Retail Gasoline Outlets (RGOs) that, as a source category which has been specifically identified, will be impacted by the proposed Standard Urban Storm Water Mitigation Plans (SUSMPs).

First, in spite of WSPA's recent, active, involvement in stormwater quality issues affecting RGOs, we have not received notice -- either from the Regional Board, or, from the County of Los Angeles – of the specifics of the upcoming September 16, 1999 Board meeting to consider the subject SUSMPs. (An associate sent me a copy of the Notice of Public Hearing, by Fax, only this morning.) Unhappily, I must therefore raise the issue of lack of adequate notice.

Between WSPA and our member companies, we have not been told about how an RGO could achieve compliance with the requirements of the proposed SUSMPs. However, based on the concepts discussed at the August 10th workshop at the L.A. County Department of Public Works, we would offer three preliminary comments regarding the SUSMP as it might be applied to an RGO:

1. No data or information, that we can recall, has ever been presented to demonstrate that stormwater runoff from RGOs in the County of Los Angeles is causing impairment of any body of water. Thus, it would seem that capturing stormwater runoff from RGOs, as is being proposed, is without any demonstrable environmental benefit.

2. The owners and operators of RGOs have gone to great lengths (e.g., the December 1998 UST upgrade requirements) to protect the subsurface environment from contamination due to spills or leaks. WSPA is currently working with the SWRCB, and other agencies, to evaluate the need for additional measures to eliminate pathways for potential pollutants to reach soil and groundwater. In view of the concerns regarding soil and groundwater, it would not appear to be reasonable, or prudent, to purposefully open new pathways (e.g., pervious pavement, etc.).

R0070095

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3. Whereas one option for capturing stormwater runoff might be an underground tank or sump, there are several serious problems with the concept – not the least of which is safety. We believe that there would be serious public safety concerns associated with a closed, underground volume that could contain a small amount of gasoline (e.g., from a small spill) in a large volume of air.

Thus, the proposed SUSMPs, as we believe we understand them, appear to be both an environmental dis-benefit, and a potential safety concern.

WSPA respectfully requests that, in view of the lack of adequate notice, the September 16th hearing to consider the SUSMPs be postponed. We would further request the opportunity to discuss these issues with you and your staff to ensure that any future requirements are appropriate and are truly protective of the environment.

Please do not hesitate to contact me at 818/543-5324 if we may provide any additional information.

Sincerely,

Ronald R. Wilkniss
South Coast Issues Coordinator



January 24, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Loa Angeles Region
320 West 4th Street, Suite 200
Loa Angeles California 90013

Re: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

It is my understanding that the California Regional Water Quality Control Board - Los Angeles Region (Board) will be holding a public hearing on January 26, 2000 on the adoption of the proposed Standard Urban Storm Water Mitigation Plans (SUSMP) as required under the the Los Angeles County Municipal Storm Water Permit (Order No. 96-054). As a Southern California businessperson I support the goals of the clean water, however, after reviewing the December 7, 1999 revision of the SUSMP, I am opposed to certain provisions within the plan.

Included in the revised SUSMP are several new and modified definitions that restrict development activity. Specifically, I am concerned with the attempt to define "Hillside" and "Environmental Sensitive Area" and the addition of "Parking Lots" to the list of projects subject to the SUSMP requirements. These requirements make the implementation of the SUSMP completely impractical in many municipalities in the Los Angeles County.

Additionally, the continued inclusion of a numerical mitigation standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

Once again, let me reiterate that I fully support the goal of cleaning our storm water run off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This initiative makes a commitment to clean water and, perhaps more importantly, it supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

Therefore, I respectfully request that you and the Board delete the language outline above expanding the scope of the SUSMP and reject the implementation of a numerical mitigation standard. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,
Weston Communities Corp.

John A. Ashkar
President

cc: Mr. Hamid Nahai, Chair
California Regional Water Quality Control Board, Los Angeles Region

R0070097

11-345 388

10960 Wilshire Boulevard, Suite 1960, Los Angeles, California 90024 (310) 479-9900 Fax: (310) 477-8519

WEST POINTE
HOMES, INC.

January 21, 2000

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, California 90013

RECEIVED
2000 JAN 26 P 2:13
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

RE: Standard Urban Storm Water Mitigation Plan

Dear Mr. Dickerson:

I have received and reviewed the December 7, 1999 Standard Urban Stormwater Mitigation Plan (SUSMP) that will be discussed by the California Water Quality Control Board – Los Angeles Region (Board) on January 26, 2000. It is my understanding that the SUSMP program is called for in the National Pollutant Discharge Elimination System (NPDES) for Los Angeles County Municipal Stormwater Permit (Order #96-054).

As a Southern California resident and home building professional, I support the Board's efforts in developing and implementing policies and programs that will reduce pollution resulting from stormwater run-off and achieve clean water in the Los Angeles region. However, I am concerned with the current proposed staff recommendations to the SUSMP. As mentioned before, I support the Boards efforts for achieving clean water, but as the individual who must implement the SUSMP program as I construct new homes, I must say that this program falls short in achieving our shared goal of delivering clean water to our local rivers, streams, wetlands, bays and the ocean.

ADOPT THE SUSMP WITH AMENDMENTS

Since the release of the original SUSMP in late August, 1999 and the September 16, 1999 Board hearing, there have been many changes by staff that has made the SUSMP more complex and confusing to interpret and implement.

First, the December 7, 1999 SUSMP proposal has added several new and stricter definitions. The definition for "Hillsides," "Parking Lots," and "Environmental Sensitive Areas" have been dramatically changed since the September 16, 1999 Board hearing. These new definitions have not been discussed yet in a public hearing or with the regulated communities.

Definition of Hillsides

The December 7, 1999 SUSMP has changed the definition of "Hillside" without review by the municipalities, the regulated communities or interested parties. Therefore, we suggest that the Board to modify the definition as property located in an area with known erosive soil conditions, where the development would involve regulated grading on any natural slope that is 25 percent or greater, or delegate the authority of this definition to the local municipalities (i.e., the cities or county).

R0070098

26500 W. Agoura Road, Box 652, Calabasas, CA 91302-1952
(805) 370-0075; (805) 370-0165 Fax
email: westpointehomes@earthlink.net

Therefore, I respectfully request that you and the Board correct the above-mentioned problems to the SUSMP. In addition, I ask that you support the comprehensive "Clean Water Initiative" as a way of truly achieving stormwater pollution reduction.

Sincerely,

James Rasmussen
West Pointe Homes Inc.

cc: Mr. Hami Nahmi, Chair
California Regional Water Quality Control Board, Los Angeles Region

26500 W. Agoura Road, Box 652, Calabasas, CA 91302-1952
(805) 370-0075; (805) 370-0165 Fax
email: westpointehomes@earthlink.net

THE CLEAN WATER INITIATIVE

The following is an alternative approach to SUSMP implementation which is supported by a variety of public and private organizations, companies and individuals. Those supporting this initiative favor enhanced water quality and improved storm water management.

The centerpiece of this initiative is a strong commitment to clean water through actual and measurable pollutant reduction. This is achieved through an inclusive process driven approach based on sound science (water quality and waste load analysis) and proven techniques (applied and tested BMPs). This is far better than simply relying on a volumetric approach (numeric standards) which is based solely on the "quantity" of water captured rather than the "quality" of the water released.

Commitments

The public and private organizations, companies and individuals supporting this initiative make the following commitments towards clean water and stormwater mitigation in Southern California:

- We commit to clean water
- We commit to implementing quality Best Management Practices (BMPs)
- We commit to doing demonstration projects and pilot programs on specific BMPs
- We commit to developing watershed management plans for each watershed in the Basin
- We commit to work cooperatively with **all** of the other stakeholders in this issue (the regulated community, the environmental community and the municipalities) to enhance water quality and improve stormwater management

Expectations

While we as public and private organizations, companies and individuals are willing to make important commitments towards clean water and stormwater mitigation, we also expect the Los Angeles Regional Water Quality Control Board (LARWQCB) to live up to its legal responsibilities regarding this issue. It is our belief that the LARWQCB can best do this by committing to support only those policies based on sound science, quality research and proven techniques. To do this it is our expectation that the LARWQCB will do the following analysis to verify the value of their policy initiatives:

- Water Quality Analysis
- Waste Load Analysis
- Cost Effectiveness Analysis

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(805) 370-0075; (805) 370-0165 Fax
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Parking Lots

A new category subject to SUSMP, "Parking Lots" was added without a public hearing or input for the municipalities, the regulated communities or interested parties. It is unclear why and how the "Parking Lots" will be defined and implemented under the SUSMP. Furthermore, it is my understanding that the Long Beach municipal storm water permit includes a special study provision to characterize pollution and evaluate controls for parking lots. I suggest that the Board wait for the results of the Long Beach study on parking lots before adding this category to the SUSMP, or that "Parking Lots" be defined to apply only to commercial "stand alone" parking lots, and not Parking lots that are not associated with small commercial developments.

Environmentally Sensitive Areas

Once again, staff has added another new category of "Environmentally Sensitive Areas" to the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. This new category has many different and conflicting provisions under federal, state and local law. Furthermore, these many different provisions of law, regulation, and guidance define a variety of environmentally sensitive areas that, taken together, will result in the application of SUSMP criteria to an inherently vague definition leading to application of those criteria in situations where it was not intended. We suggest the Board work with the municipalities, the regulated communities and interested parties on developing one single definition.

DO NOT ADOPT A NUMERICAL DESIGN STANDARD

At the September 16, 1999 Board hearing on the SUSMP, the only significant difference between the staff's proposal and that of the municipalities, the regulated communities and interested parties was the inclusion of a numerical design standard for the sizing of Best Management Practices. The staff proposal includes a specific design standard in the SUSMP without a public hearing or input for the municipalities, the regulated communities or interested parties. Additionally, the continued inclusion of a numerical design standard in the SUSMP, whose benefits have not been proven and whose cost effectiveness has not been studied, makes it impossible for me to support the proposed SUSMP.

"CLEAN WATER INITIATIVE"

Once again, let me reiterate that I fully support the goal of reducing pollution caused by stormwater run-off. That is why I support the attached "Clean Water Initiative," which is also supported by a number of regulated industries and business leaders. This Initiative makes a commitment to clean water and supports a process by which clean water can become a reality. The process outlined in the Initiative is additionally supported by the Southern California Association of Governments and would involve all affected parties (the regulated community, municipalities and the environmental community) in a thoughtful process based on sound science and proven techniques.

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email: westpointehomes@earthlink.net

Process

We believe that a thoughtful "process driven" approach should be employed for the development of appropriate public policy regarding stormwater mitigation in Southern California. Further, we believe that the SUSMP Policy approved on January 6, 2000 by the Regional Council of the Southern California Association of Governments (SCAG) offers a quality process driven approach to SUSMPs. We support this policy, as outlined below, and would seek its inclusion in the final SUSMP resolution adopted by the LARWQCB.

The Southern California Association of Governments recommends that:

- *the Los Angeles Regional Water Quality Control Board not adopt SUSMP numeric standards until such time as the Board can validate the feasible, technical and scientific bases for numeric standards.*
- *the Board monitor pilot programs similar to those underway in Los Angeles County.*
- *the Board work closely with cities such as Calabasas, Santa Clarita and Santa Monica to assess the effectiveness of local initiatives aimed at managing runoff water flows and quality.*
- *the Board develop a Memorandum of Understanding with SCAG in which SCAG would incorporate a Best Management Practices for Preventing Storm Water Runoff Pollution in the Los Angeles Basin project in its Environmental Programs and Livable Communities work elements.*
- *the Board ask SCAG to manage a legal authorities initiative in which all of the 85 cities in the Los Angeles Basin would work to develop model language which would then be available for municipal implementation throughout the Basin.*
- *the Board invite SCAG to contribute its Section 208 authorities to a collaboration with other key organizations/stakeholders in scoping out plans for a watershed management initiative program in each watershed of the Basin.*
- *the Board evaluate the operating results of watershed (regional) mitigation programs prior to its consideration of any general retrofit mandates on existing land uses.*
- *the Board and SCAG cooperate with other stakeholders in putting best efforts into raising the new financial resources needed for planning and implementing these water quality commitments.*
- *the Board's staff be encouraged to meet with those SCAG sub-regional councils affected by the SUSMP program prior to any Board action on these matters.*

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	Los Angeles Co., CA	Alameda, CA	Orange Co., CA	Riverside Co., CA	San Bernardino Co., CA	San Jose, CA	Las Vegas, NV	Portland, OR	Puget Sound, WA	Austin, TX	Minn.	Alexandria, VA	Montgomery Co., MD
WHICH PROJECTS INITIATE STORMWATER BMP CONSIDERATION?													
None, BMP information given.						X	X	X			X		
All projects requiring building/grading permits.	X	X	X	X	X					X		X	
Exceptions: Single-family residences separately built and not part of a subdivision.				X						X		X	
Additions or modifications to single-family detached residential structures.				X						X		X	
Sites not exceeding one-half acre of disturbance.												X	
Total size of preexisting impervious area is reduced by an amount equal to or greater than 20% of the entire site.												X	
All new development and redevelopment that includes the creation or addition of 5,000 sq. ft., or greater, of new impervious surface area, and/or land disturbing activity of one acre or greater, shall require permanent stormwater BMPs.									X				X
Exceptions: Agricultural land management activities.									X				X
Additions or modifications to existing single-family detached residential structures.									X				X
Residential developments consisting of single-family structures each on a lot of two acres or greater.													X
Redevelopment of existing sites greater than 1 acre in size with 50% or more impervious surface.									X				
Redevelopment of sites that discharge to a receiving water that has a documented water quality problem.									X				

R0070103

	Los Angeles Co., CA	Alameda, CA	Orange Co., CA	Riverside Co., CA	San Bernardino Co., CA	San Jose, CA	Las Vegas, NV	Portland, OR	Puget Sound, WA	Austin, TX	Minn.	Alexandria, VA	Montgomery Co., MD
Sites where the need for additional stormwater control measures have been identified through a basin plan, the watershed ranking process under Ch. 400-12 WAC, or through Growth Management Act planning.									X				
WHAT ARE THE STORMWATER REQUIREMENTS?													
Storm Water Management Plan or equivalent.	X	X	X	X	X	X	X	X	X	X		X	X
Post-development peak runoff rate for both 2-year and 10-year storms, considered individually, shall not exceed their pre-development rates.												X	
Water quality volume (0.5 inch of runoff x total impervious area of development site) must be treated with structural BMPs.												X	
Structural BMPs adopted for any new development must treat the runoff so that the estimated post-construction nonpoint source pollution loading does not exceed the estimated pre-development nonpoint source pollution loading of runoff.												X	
Additional requirements for redevelopment:												X	
If currently served by properly functioning BMPs, the regulated activity shall not increase nonpoint source pollution load in the runoff.												X	
If not served by properly functioning BMPs, the development must reduce estimated nonpoint source pollution load in runoff by 10% based on actual pre-development and post-development site conditions.												X	
If site is completely impervious as currently developed, it shall be considered to comply with the stormwater management requirements if the applicant restores a minimum 20% of the site to vegetated open space.												X	

R0070104

	Los Angeles Co., CA	Alameda, CA	Orange Co., CA	Riverside Co., CA	San Bernardino Co., CA	San Jose, CA	Las Vegas, NV	Portland, OR	Puget Sound, WA	Austin, TX	Minn.	Alexandria, VA	Montgomery Co., MD
Developer must consider the following optional structural BMPs:													
Infiltration	When applicable		X	X	X		X	X	X		X		X
Flow attenuation by the use of vegetated swales and natural depressions	When applicable		X	X	X		X	X	X		X		X
Retention and/or Detention facilities	When applicable		X	X			X	X	X		X		X
Developer must describe why certain BMPs were selected and why the BMPs not selected were unfeasible.	When applicable												X
All structural BMPs must meet the following requirements:													X
Have a tributary drainage area not in excess of 400 acres unless, on a case-by-case basis, a larger drainage area is approved.													X
Manage the 1 inch rainfall event according to infiltration standards and specifications; or Provide for a permanent pool equal to or greater than ½ inch of runoff from the drainage area; or Provide 24 hour detention and release of the total volume of runoff resulting from a 1 year storm (for central facilities) or the total volume of runoff from a 1 inch rainfall (for on-site facilities).													X
The developer must give consideration to incorporating the use of natural topography and land cover including wetlands, ponds, natural swales, and depressions as they exist prior to development.	X				X				X	X			X
All on-site storm drain inlets must be labeled "No Dumping - Drains to Bay" or equivalent.	X	X	X	X	X				X				

R0070105

	Los Angeles Co., CA	Alameda, CA	Orange Co., CA	Riverside Co., CA	San Bernardino Co., CA	San Jose, CA	Las Vegas, NV	Portland, OR	Puget Sound, WA	Austin, TX	Minn.	Alexandria, VA	Montgomery Co., MD
All on-site storm drains must be cleaned at least once a year immediately prior to the rainy season. Additional cleaning may be required.	X	X	X	X							X		
Trash enclosures and/or recycling area(s) shall be covered; no other area shall drain onto this area.	X	X	X	X							X		
Most washing, car wash, and/or steam cleaning must be done at an appropriately equipped facility that drains to the sanitary sewer. Any outdoor washing or pressure washing must be managed in such a way that there is no discharge of soaps or other pollutants to the storm drain.	X	X	X	X						X			
Landscaping shall be designed with efficient irrigation to reduce runoff, promote surface infiltration, and minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where feasible, landscaping should be designed and operated to treat stormwater runoff. When and where possible, xeriscape and drought tolerant plants shall be incorporated into new development plans.	X	X	X	X	X			X		X			
All loading dock areas must be designed to minimize "run-on" or runoff from the area. Accumulated waste water that may contribute to the pollution of stormwater must be drained to the sanitary sewer or intercepted and pretreated prior to discharge to the storm drain system. The property owner shall ensure that BMPs are implemented to prevent potential stormwater pollution. These BMPs shall include, but are not limited to, a regular program of sweeping, litter control and spill clean-up.	X	X	X	X									
All paved outdoor storage areas must be designed to reduce/limit the potential for runoff to contact pollutants.	X	X	X	X	X								
Sidewalks and parking lots shall be swept regularly to prevent the accumulation of litter and debris. If pressure washed, debris must be trapped and collected to prevent entry to the storm drain system. If any cleaning agent or degreaser is used, washwater shall not discharge to the storm drains; washwaters should be collected and discharged to the sanitary sewer.	X	X	X	X						X	X		

	Los Angeles Co., CA	Alameda, CA	Orange Co., CA	Riverside Co., CA	San Bernardino Co., CA	San Jose, CA	Las Vegas, NV	Portland, OR	Puget Sound, WA	Austin, TX	Minn.	Alexandria, VA	Montgomery Co., MD
Restaurants, where deemed appropriate, must be designed with a contained area for cleaning mats, equipment and containers. This contained wash area shall be covered or designed to prevent run-on or runoff from the area. The area shall not discharge to the storm drains; washwaters should drain to the sanitary sewer.	X	X											
Fuel dispensing areas must be paved with portland cement concrete (or, equivalent smooth impervious surface), with a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable. This area must be covered, and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area. The cover must not drain onto the fuel dispensing area.	X	X	X	X									
Prior to issuance of certificates of use and occupancy or building permits for individual tenant improvements or construction permits for a tank or pipeline, uses shall be identified and, for specified uses the applicant shall propose plans and measures for chemical management.	X		X	X	X							X	
Certificates or permits may be ministerially withheld if features needed to properly manage chemicals cannot be incorporated into a previously completed building, center, or complex.	X		X	X	X							X	
Development or redevelopment not to exceed a maximum percentage of impervious surface area. Percentage to be determined by Co-permittees.					X								
Development or redevelopment facility must include structures to capture percentage of runoff for treatment. Percentage to be determined by Co-permittees.					X								
Have required procedures for site planning to help designers focus on avoiding hydrologic and nonpoint source water pollution impacts in housing developments.											X		

R0070107

	Los Angeles Co., CA	Alameda, CA	Orange Co., CA	Riverside Co., CA	San Bernardino Co., CA	San Jose, CA	Las Vegas, NV	Portland, OR	Puget Sound, WA	Austin, TX	Minn.	Alexandria, VA	Montgomery Co., MD
WHAT ARE THE MAINTENANCE REQUIREMENTS?													
The design, location, maintenance requirements, and maintenance schedule for any stormwater quality treatment structural controls shall be submitted for review and approval prior to the issuance of a building permit.	X	X	X	X	X	X		X	X	X		X	X
A property owners association shall be created and shall be responsible for maintaining all private streets, private utilities and other privately owned common areas and facilities on the site including landscaping. These maintenance responsibilities shall include implementing and maintaining stormwater BMPs associated with improvements and landscaping.	X	X	X										X
Prior to the sale of the first residential unit, the CC&R's shall describe how the stormwater BMPs associated with privately owned improvements and landscaping shall be maintained by the property owner association.	X	X	X										X
All stormwater management structures must be maintained in proper working condition by the owner of the facility. If, after due notice, a facility is not properly maintained, the County may perform the necessary maintenance and assess the cost to the owner.													X
The developer may request the County, through the Director to accept any on-site stormwater management facility for County maintenance. The Director may accept those facilities for County maintenance, on a case-by-case basis where the Director determines it would be in the best interest of the County to maintain such facility and that public funds are available to perform such maintenance.										X			X

Winston H. Hickox
Secretary for Environmental Protection

California Regional Water Quality Control Board

Los Angeles Region

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640
Internet Address: http://www.swrcb.ca.gov/~rwqcb4

Gray Davis
Governor

Notice of Public Meeting/Hearing

Serving Coastal Los Angeles & Ventura Counties

Thursday, September 16, 1999 ***424th Regular Board Meeting***
9:00 a.m.

Meeting Location:

Main Board Room
Metropolitan Water District of Southern California
700 North Alameda Avenue *(next to Union Station)*,
Los Angeles, California

Agenda

Submittal of Written Material for Regional Board Consideration

To ensure that the Regional Board has the opportunity to fully study and consider written material, it is necessary to submit 15 copies at least five (5) days before the meeting. This will allow distribution of the material to the Board Members and appropriate staff in advance of the meeting. Pursuant to Title 23 California Code of Regulations Section 648.2, the Regional Board may refuse to admit written testimony into evidence unless the proponent can demonstrate why he or she was unable to submit the material on time or that compliance with the deadline would otherwise create a hardship. If any other party demonstrates prejudice resulting from admission of the written testimony, the Regional Board may refuse to admit it. If you are reading a statement at the meeting, please provide the Executive Assistant with a copy at the meeting.

The Board will recess for a 15-minute break at approximately 10:30 a.m. and recess for lunch at approximately 12:30 pm. The meeting will reconvene at approximately 1:30 pm.

Pledge of Allegiance.

1. Roll Call.
   [Robyn Goodman, 213/576-6613].....Board Members Present

2. Order of Agenda.....Board Direction
   (The agenda items are numbered for identification purposes only and will not necessarily be considered in this order).

3. Approval of Regular Meeting Minutes of July 8, 1999 and August 12, 1999.
   [Robyn Goodman, 576-6613].....Board Action

4. Annual Supervisory Performance Award. *(The Board will present a supervisor(s) with the Annual Supervisory Performance Award for 1998/99.)*
[Dennis Dickerson, 576-6605].....Board Action

5. Board Member Ex Parte Communication Disclosure.
[Jorge Leon, 916/657-2428].....Information/Discussion
(Board Members will identify any discussions they may have had requiring disclosure pursuant to Government Code Section 11430.40.)

6. Uncontested Items Calendar.....Board Action
(Items marked with an asterisk are expected to be routine and noncontroversial. The Board will be asked to approve these items at one time without discussion. If any interested party, Board Member, or staff person requests that an item be removed from the calendar, it will be taken up in the regular agenda order.

7. Public Forum. (*Any person may address the Board regarding any matter within the Board's jurisdiction. This need not be related to any item on the agenda. Remarks will be limited to three (3) minutes.)*

WASTE DISCHARGE REQUIREMENTS

8. **Consideration of NPDES Permit Requirements – New, Renewal, Rescission**
(After a hearing, the Board will be asked to adopt or rescind the proposed permits for the following facilities.)

New

*8.1 Coltec Industries Inc. (Former Menasco Aerosystem Facility), Burbank
[Kwang-il Lee, 576-6666] *{Los Angeles River Watershed}*.....CA0064319

Renewal

8.2 Los Angeles Refining Company (formerly Texaco Refining and Marketing, Inc.), Wilmington [Gary Schultz, 576-6665] *{Dominguez Channel Watershed}*.....CA0003778

Rescission

*8.3 Los Angeles County Department of Public Works (Alamitos Barrier Project), Long Beach [Kwang-il Lee, 576-6666] *{Los Cerritos Channel Watershed}*.....CA0063371
*8.4 Jayeast Partnership (Central Plaza), Cerritos [Dan Radulescu, 576-6668]
{San Gabriel River Watershed}.....CA0061336
*8.5 Pennzoil-Quaker State Co., Rancho Dominguez [Gary Schultz, 576-6665]
{Los Angeles River Watershed}.....CA0059480

9. **Consideration of Non-NPDES Permit Requirements – New, Revision**
(After a hearing, the Board will be asked to adopt the proposed requirements for the following facilities.)

New

9.1 Carrier Corporation: Feasibility Study using Chemical Oxidants to Remediate Chlorinated VOCs in Groundwater [Dixon Oriola, 576-6803]
{Los Angeles River Watershed}.....97-044

*9.2 City of Los Angeles Department of Water and Power (Headworks Well Replacement and Development Project), Los Angeles [Jau Ren Chen, 576-6656]
{Los Angeles River Watershed}.....99-112

Revision

*9.3 Penn Camarillo Realty Corporation (G&H Technology, Inc.), Camarillo [Peter Raftery, 576-6796] *{Calleguas Creek Watershed}*.....96-002

*9.4 Ventura Regional Sanitation District (Piru Wastewater Treatment Plant), Piru [Rod Nelson, 576-6719] *{Santa Clara River Watershed}*.....89-044

ENFORCEMENT ISSUES

10. Consideration of Administrative Civil Liability (ACL) Complaint No. 99-012 Against Beazer Homes Southern California (Construction Site on Sequoia Avenue & Corto Street, Simi Valley) for Non-Stormwater Waste Discharges and Failure to Submit Notice of Intent to Comply with the General Permit on Storm Water Discharges Associated with Construction Activity. *(The Board will conduct a public hearing to receive evidence and testimony concerning an ACL Complaint issued to Beazer Homes Southern California. Following the public hearing, the Board may take action to affirm, modify, or rescind the ACL).*
[Mark Pumford, 576-6657/Hugh Marley, 576-6687].....Board Action

*11. Consideration of a Resolution Authorizing the Executive Officer to Approve a Settlement Agreement and a Supplemental Environmental Project (SEP) to be funded by the Los Angeles County Metropolitan Transit Authority (MTA). *(The Board will be asked to adopt a Resolution authorizing the Executive Officer to approve a Settlement Agreement and SEP resolving Complaint No. 99-034 for Administrative Civil Liability).* [Wendy Phillips, 576-6618].....Board Action

12. Consideration of Enforcement Actions Against Los Angeles Refining Company, a Division of Equilon Enterprises LLC (formerly Texaco Refining and Marketing, Inc.) *(Subsequent to a public hearing, the Board will be asked to adopt a Cease and Desist Order (No. 99-013) to ensure timely completion of treatment system upgrades and/or construction of the proposed sewer connection; and consider whether to affirm, modify or rescind the Administrative Civil Liability (No. 99-070) issued for Effluent Discharges in Violation of NPDES Permit Order No. 84-053 and for Failure to Furnish Monitoring Reports under Section 13260.)*
[Hugh Marley, 576-6687].....Board Action

12.1 Consideration of Cease and Desist Order No. 99-013
12.2 Consideration of Administrative Civil Liability No. 99-070

13. Consideration of Petition for Review of Cleanup and Abatement Order (CAO) No. 99-015, issued by the Executive Officer pursuant to his Delegated Authority, Requiring Spartan Lacquer and Paint Co. to Cleanup and Abate Conditions of Pollution at 9255 E. Imperial Highway, Downey, CA. *(The Board will conduct a public hearing to receive evidence and testimony concerning the CAO. Following the public hearing, the Board may take action to affirm, modify, or rescind the CAO.)*[John Geroch, 576-6767].....Board Action

INFORMATION ITEMS *(Please note that these items are for information only. There will be no voting or formal action taken by the Board on these items.)*

14. Report on Executive Officer's Intent to Approve the Standard Urban Storm Water Mitigation Plans Submitted for Approval Under the Los Angeles County Municipal Storm Water Permit, Order No. 96-054. *(The staff will provide a report to the Board detailing the Executive Officer's plan to approve the SUSMP's with changes.).*
[Xavier Swamikannu, 576-6654].....Board Direction

15. Discussion of Regional Board 1999/00 Priorities. *(The Board will discuss the recently developed draft 1999/00 Regional Board priorities.)*

16. Report of Cost Benefit Task Committee.....Information/Discussion
(The Committee will give a progress report.) [Mr. Keston]

17. Board Member Communications.....Information/Discussion
(The Board Members may discuss communications, correspondence, or other items of general interest relating to matters within the Board's jurisdiction.)

18. Executive Officer's Report.....Information/Discussion

19. Closed Session. .....By Board

At any time during the regular session, the Board may adjourn to a closed session to consider litigation, personnel matters, or to deliberate on a decision to be reached based upon evidence introduced in a hearing. Discussion of litigation is within the attorney-client privilege and may be held in closed session. Authority: Government Code Sections 11126(a)(d)(q).

20. Adjournment of Current Meeting. Next Regular Meeting is Thursday, October 28, 1999, at 9:00 a.m. at the Richard H. Chambers U.S. Court of Appeals Building, 125 S. Grand Avenue, Main Courtroom #3, Pasadena.

**

A copy of the complete agenda package is available for examination at the Regional Board Office during regular working hours. Questions about specific items on the agenda should be directed to the staff person whose name is listed with the item.

***

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A listing of pending water quality certification applications currently on public notice pursuant to Section 401 of the Federal Clean Water Act may be obtained by calling Alex Fu at 213/576-6692.

California Regional Water Quality Control Board
Los Angeles Region

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nvironmental
Protection

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Notice of Public Meeting/Hearing

Serving Coastal Los Angeles & Ventura Counties

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REGIONAL BOARD STAFF MEMBERS

Leticia Aguilar
Mazhar Ali
Augustine Anijielo
Elsa Aquino
Rosario Aston
Jenny Au
Blythe Ponek-Bacharowski
Magdy L. Baiady
Nhan Bao
Maria Bambico
Karen Caesar
Alex Carlos
Chandra Cansler
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Xavier Swamikannu, D.Env.
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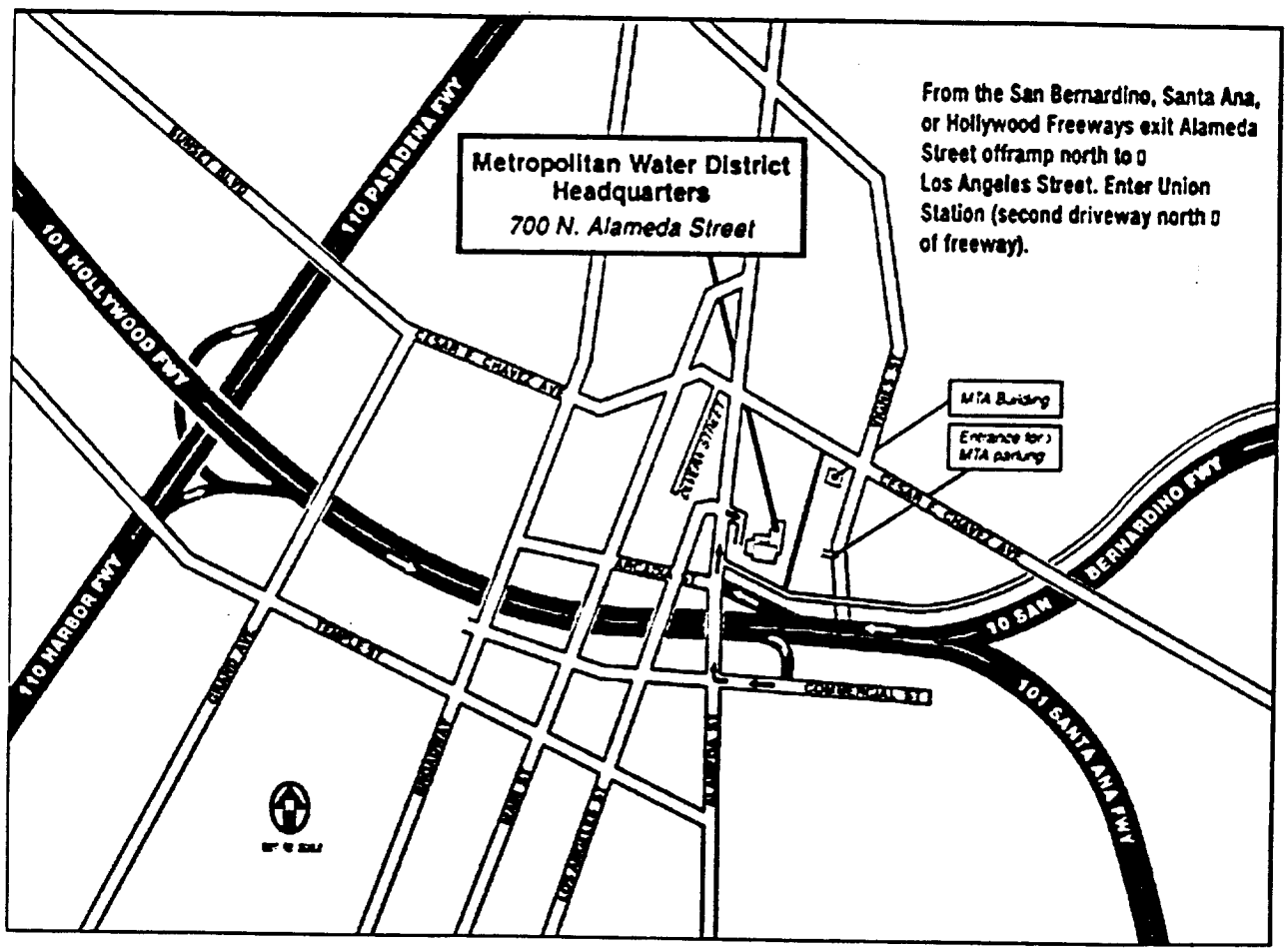
Andrea Wen
Twila Willis-Hunter
Jimmie Woo
Marian Woo
Tracy Woods
Wen Yang, Ph.D.
Aniela Zaskodna
Myriam Zech


Metropolitan Water District
Headquarters
700 N. Alameda Street
From the San Bernardino, Santa Ana, or Hollywood Freeways exit Alameda Street offramp north to Los Angeles Street. Enter Union Station (second driveway north of freeway).
110 PASADENA FWY
101 HOLLYWOOD FWY
110 HARBOR FWY
10 SAN BERNARDINO FWY
101 SANTA ANA FWY
MTA Building
Entrance for MTA parking

R0070118

California Regional Water Quality Control Board
Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
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Gray Davis
Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
Los Angeles Region

NOTICE OF MEETING
(Govt. Code Section 11125)

TMDL Conference
Wednesday, September 29, 1999
8:00 am - 5:00 pm

Conference Location:

University of Southern California
Davidson Executive Conference Center
3415 South Figueroa Street
Los Angeles, CA 90089

The Los Angeles Regional Board, the City of Los Angeles Department of Public Works – Bureau of Sanitation, and the University of Southern California are sponsoring a conference entitled *"Achieving Success in the TMDL Program"*. The purpose of this conference is to help stakeholders understand the many aspects of the TMDL (Total Maximum Daily Load) process including the legal and regulatory framework, perspectives and challenges, and tools to effectively implement pollutant load reductions.

Regional Board Members may be attending the conference, but no action will be taken during this special event and no voting will take place.

For further information regarding this conference, please call Ms. Chris Harris, Harris & Company at (213) 749-3386 or Renee DeShazo, RWQCB at (213) 576-6783.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

320 W. 4th Street, Suite 200
Los Angeles, California 90013
Tel No. (213) 576-6600; Fax No.: (213) 576-6660

Public Notice No. 99-047

NPDES No. CAS0061654

NOTICE OF PUBLIC HEARING

CONSIDERATION OF STANDARD URBAN STORM WATER MITIGATION PLANS

SUBMITTED FOR APPROVAL TO THE EXECUTIVE OFFICER

UNDER

THE LOS ANGELES COUNTY MUNICIPAL STORM WATER PERMIT

This Regional Board will hold a hearing to consider standard urban storm water mitigation plans submitted for approval to the Executive Officer under the municipal storm water permit for Los Angeles County and Cities.

HEARING DATE AND LOCATION:

DATE: Thursday, September 16, 1999
TIME: 9:00 a.m.
PLACE: Metropolitan Water District of Southern California
700 N. Alameda Street (next door to Union Station), Main Board Room
Los Angeles

AVAILABILITY OF DOCUMENTS

The Standard Urban Storm Water Mitigation Plans, and other related documents and information are on file, and may be inspected, at the Regional Board office, 320 W. 4th Street, Suite 200, Los Angeles, California, 90013, between the hours of 8:00 a.m. and 5:00 p.m. Arrangements for file review and/ or obtaining copies of documents may be made by contacting Vilma Correa at (213) 576-6617. The Standard Storm Water Mitigation Plans may also be viewed on-line at the Los Angeles County Department of Public Works website address, http://dpw.co.la.ca.us/epd/mitigation/

Questions regarding the documents or the hearing should be directed to Dr. Xavier Swamikannu at (213) 576-6654.

R0070120

BACKGROUND

Los Angeles County and Cities (except the City of Long Beach) implement a municipal storm water program to reduce storm water and urban runoff pollution under the requirements of Board Order No. 96-054. The City of Long Beach implements a separate municipal storm water program to reduce storm water and urban runoff pollution under Board Order No. 99-060.

The Regional Board at its April 22, 1999, Hearing approved a List of Best Management Practices for Permittees to select from and require implementation of the most effective BMPs in their Development Planning and Development Construction programs (Board Resolution No. 99-03). The Regional Board at that time also requested that the Standard Urban Storm Water Mitigation Plans (SUSMPs) for Priority Planning Project categories, which incorporate the BMPs, be brought to it for discussion. The municipal storm water permit for the City of Long Beach, adopted by the Regional Board on June 30, 1999, includes requirements that make SUSMP provisions adopted by the Regional Board or approved by the Regional Board Executive Officer to be applicable to its program.

Los Angeles County Department of Public Works (LACDPW), on behalf of Permittees, submitted SUSMPs for Executive Officer approval on July 22, 1999. These SUSMPs were revised and resubmitted on August 12, 1999, after a joint SUSMP workshop held on August 10, 1999, to clarify some text. SUSMPs have been submitted for: (i) 100+ home subdivision; (ii) 10-99 home subdivision; (iii) 100+ square-foot commercial development; (iv) automotive repair facilities; (v) retail gasoline outlets; (vi) restaurants; (vii) hillside located single-family dwelling. Prior to submittal to the Regional Board, draft versions of the SUSMPs were distributed to environmental groups, contractors, developers, consultants and trade industry groups for review and comment.

The SUSMPs for: (i) 100+ home subdivision; (ii) 10-99 home subdivision; (iii) 100+ square-foot commercial development include requirements that storm water runoff mitigation with "treatment control" BMPs be considered, in addition to structural control BMPs and source control BMPs. The SUSMPs for (iv) automotive repair facilities; (v) retail gasoline outlets; (vi) restaurants; (vii) hillside located single-family dwelling require only structural control BMPs and source control BMPs. The SUSMPs do not provide a numerical mitigation measure for storm water to facilitate the development of BMP design criteria.

For discussion before the Regional Board is staff recommendation that the Regional Board Executive Officer approve the SUSMPs with the following changes:

A. The SUSMPs for categories: (iv) automotive repair facilities; (v) retail gasoline outlets; (vi) restaurants; and (vii) hillside located single-family dwelling, require consideration of "treatment control" BMPs; and include the BMPs in "SUSMP Section 3. Minimize Storm Water Pollutants of Concern" as Example BMPs.

B. Incorporate in, "SUSMP Section 3. Minimize Storm Water Pollutants of Concern", numerical mitigation measures for BMP design criteria based on the "mitigation" of smaller storms to capture a large percentage of runoff events, runoff volume and pollutant loads. This mitigation measure may be derived from:

   1. the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area (*Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, 1998*), or

2. a historical-record based reference 24-hour rainfall criterion (0.75 inch for the Los Angeles County area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

COMMENTS AND QUESTIONS

Persons wishing to comment on the SUSMPs are invited to submit them in writing at the above address to the attention of Dr. Xavier Swamikannu. In order to be evaluated by Board staff and included in the Board's agenda folder, written comments or testimony on the tentative permit must be received at the Regional Board's office by September 2, 1999. Comments received after that date will be provided, *ex agenda*, to the Board for their consideration.

HEARING PROCEDURE

The Board meeting, in which the hearing will be part of, will start at 9:00 am. Interested persons are invited to attend. Oral statements will be heard; however, for the accuracy of the record, all important testimony should be in writing. Oral testimony may be limited to 5 minutes or less for each speaker, depending on the number wishing to be heard. Parties with similar concerns or opinions are encouraged to choose one representative to speak.

Date: August 16, 1999

R0070122

OPENING STATEMENT – Contested Items

THIS IS A PUBLIC MEETING TO CONSIDER BOARD ACTION REGARDING STANDARD URBAN STORMWATER MITIGATION PLANS (SUSMPS) WHICH HAVE BEEN SUBMITTED TO THE EXECUTIVE OFFICER PURSUANT TO REQUIREMENTS OF THE LA COUNTY MUNICIPAL STORMWATER PERMIT, ORDER NO. 96-054.

DURING THIS PUBLIC HEARING, STAFF WILL PROVIDE A REPORT TO THE BOARD DETAILING THE EXECUTIVE OFFICER'S INTENTION TO APPROVE THE SUSMPS WITH CHANGES, AND ASK THE BOARD TO ADOPT A RESOLUTION EXPRESSING THE REGIONAL BOARD'S EXPECTATIONS REGARDING SUSMP APPROVAL.

COPIES OF THE STANDARD URBAN STORMWATER MITIGATION PLAN WERE SENT TO THE U.S. EPA, STATE WATER RESOURCES CONTROL BOARD, AND OTHER INTERESTED AGENCIES, PERSONS AND ORGANIZATIONS.

THE ORDER OF PRESENTATION OF TESTIMONY AT THIS MEETING WILL BE ANNOUNCED BY THE CHAIRMAN. ANYONE SO DESIRING WILL BE HEARD; IF YOU HAVEN'T FILLED OUT ONE OF THE BLUE CARDS LOCATED ON THE TABLE AT THE BACK OF THE ROOM, PLEASE RAISE YOUR HAND AND WE'LL GET A CARD TO YOU TO FILL OUT.

IT WILL BE APPRECIATED IF ALL PERSONS APPEARING BEFORE THE BOARD TODAY WILL LEAVE WRITTEN COPIES OF THEIR TESTIMONY, IF AVAILABLE. THE BOARD WILL CONSIDER ALL TESTIMONY; HOWEVER, IN THE INTEREST OF TIME, IT IS REQUESTED THAT ALL REPETITIVE AND REDUNDANT STATEMENTS BE AVOIDED. THE SETTING OF TIME LIMITS FOR THE PRESENTATION OF EVIDENCE IS AT THE DESCRETION OF THE BOARD.

MR. CHAIRMAN, WILL YOU NOW OPEN THE MEETING AND ADMINISTER THE OATH?

Winston H. Hickox
Secretary for Environmental Protection

State Water Resources Control Board

Office of Chief Counsel
901 P Street • Sacramento, California 95814 • (916) 657-2154
Mailing Address: P.O. Box 100 • Sacramento, California 95812-0100
FAX (916) 653-0428 • Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

TO: Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 4

To Gabi Mintz	From Xavier Swamikannu
Co. Heal the Bay	Co.
Dept.	Phone # (213) 576-6654
Fax # (310) 581-4195	Fax # (213) 576-6640

FROM: Jorge León
Senior Staff Counsel
OFFICE OF CHIEF COUNSEL

DATE:

SUBJECT: STANDARD URBAN STORM WATER MITIGATION PLANS PURSUANT TO ORDER NO. 96-054.

This memo provides an analysis of the legal issues that have been raised regarding the proposed Standard Urban Storm Water Mitigation Plans (SUSMPS) pursuant to Order No. 96-54.

1. Regional Board authority to adopt the proposed SUSMP.

Regional Board Order No. 96-054 ("Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges Within the County of Los Angeles") requires that each of the Permittees develop an Urban Storm Water Mitigation Plan following the model approved by the Executive Officer. (Part III.A., at Page 31.) The proposed action would adopt the model, or Standard Storm Water Mitigation Plan for the Permittees to follow.

Although Order No. 96-054 provides that the Executive Officer has authority to approve the model program, as proposed, the current proposal is being submitted to the Board itself for review and endorsement at an upcoming meeting.

The proposed SUSMPS would require, *inter alia,* (a) that the permittees provide for runoff retention and (b) that they comply with specified numerical limits. These requirements are based upon application of provisions of the Clean Water Act (CWA), section 402(p) and the 1987 Amendments to the CWA. The federal provisions require that a storm water program:

"* * *

(ii) Shall include a requirement to effectively prohibit non-storm water discharges into storm sewers; and

> (iii) Shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [Section 402(p)(3)(B), USC Section 1342(p)(3)(B), emphasis added.]

The proposal is an effort to meet the CWA requirements. In a 1992 decision, the U.S. Court of Appeals for the Ninth Circuit (NRDC *v.* U.S. U.S. EPA, 966 F.2d 1292) interpreted the above language as providing the Administrator or the State with a substantial amount of discretion:

> "[t]he language in (iii), above, requires the Administrator or the State to design controls. Congress did not mandate a minimum standards approach or specify that U.S. EPA develop minimal performance requirements...we must defer to U.S. EPA on matters such as this, where U.S. EPA has supplied a reasoned explanation of its choices."

The decision, sometimes referred to as "NRDC II," stands for the proposition that the U.S. EPA and the States are authorized to require implementation of storm water control activities that, upon "reasoned explanation," accomplish the goals of Section 402(p).

In a very recent decision, the Ninth circuit Court of Appeals reinforced the U.S. EPA's and the State's authority in this area. In Defenders of Wildlife *v.* Browner (1999) Case No. 98-71080, the Ninth Circuit Court of Appeals reviewed an action of the U.S. U.S. EPA to adopt a Storm Water Management Program in the State of Arizona. That program included best management practices such as storm water detention basins, retention basins, and infiltration ponds. The question was whether the U.S. EPA may require numeric limitations to ensure strict compliance with the state water-quality standards. The Court concluded that the CWA does not require strict compliance; however, citing the language of (iii), above, it stated: "[t]hat provision gives the U.S. EPA discretion to determine what pollution controls are appropriate. As this court stated in NRDC II, 'Congress gave the administrator discretion to determine what controls are necessary...[cites omitted] (at page 11687).

The SUSMPS proposal is an effort to meet the CWA Section 402(p) requirements and the staff has provided a "reasoned explanation of its choices" in the SUSMPs, the staff report, and the accompanying materials. Accordingly, the proposed SUSMPS requirements are well within the Regional Board's authority and discretion.

2. Compliance with the California Environmental Quality Act.

The City of Los Angeles has requested the "Regional Board's analysis of the potential multi-media environmental impacts from the proposed requirement "(i.e. the California Environmental Quality Act documentation and supporting information developed for this specific discretionary

regulatory action." The proposed action is a requirement of Order No. 96-054. The issuance of the order itself, and the requirements contained in the order, are exempt from CEQA (Water Code Section 13389). Accordingly, no specific CEQA documentation has been prepared for this proposal. Nonetheless, the staff has prepared preliminary cost-benefit analyses contained in the supporting material, and these can be provided.

3. A party commented that insufficient notice has been provided to the public regarding this matter.

As noted above, this proposal is in compliance with the requirements of Order No. 96-054. An earlier version of the SUSMPS proposal was issued to the public in August, 1999 and a public workshop was held on August 10, 1999. While the only applicable legal notice requirement is 10 days (Govt. Code Section 11125), the Regional Board staff has provided 30 days public notice of the revised version. This constitutes adequate legal notice.

4. Implementation Date.

Order No. 96-054 contemplates that implementation of the SUSMPS requirements commence no later that July 30, 1999. Since that date has passed, a new implementation date must be determined following approval of the SUSMPS by the Executive Officer. There is no legal standard upon which to base a new implementation date. The Executive Officer is free to establish a revised implementation schedule. Inasmuch as the municipalities will likely be required to adopt or amend existing ordinances to require compliance with the SUSMPS, a new implementation date should take that need into account. I recommendation that the permittees be requested to submit comments on this issue and that the Board consider alternatives proposed.

5. Unfunded Mandate.

The requirements of the proposed SUSMPS are not within the definition of "Unfunded Mandates" that would require reimbursement of costs under the California Constitution. This is because the requirements of the SUSMPS are derived from the federal Clean Water Act, not from State Law. Inasmuch as the Regional Board staff's proposal would implement a federal requirement, rather than a state requirement, the SUSMPS are not unfunded mandates.

bc:

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12-6-99
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CONTROL NO. zNumberOnRouteSlip

12/07/99 11:56 AM

From: Xavier Swamikannu
To: Dennis Dickerson
Subject: Letter of Transmittal

Suggestions for your letter of transmittal.

Second para, Sentence 2 - The proposal also.....to ensure that storm water runoff is managed for water quality concerns in addition to flood protection and that pollutants carried by storm water are retained and not delivered to waterways.

Fourth para, add - In addition, the Regional Board is being asked to adopt the numerical designs standards as the minimum standards for post-construction BMPs required by the statewide general permit for construction activity for construction projects in the Los Angeles region.

Add a statement about the Record of Decision and its availability a week from today for review. Please call (213) 576- 6764 to schedule an appointment

From: Dennis Dickerson
To: Xavier Swamikannu
Date: 9/7/99 2:04PM
Subject: SUSMPs

Xavier, your going to have to pull together a very credible presentation on the numerical limits. Need to include a brief overview of what other regions/states have in place. Also, anyone you can get to testify before the board on other regional experiences to deflect various arguments?

CC: Jorge LEON

RECEIVED
2000 MAR -6 A 9:02
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

From: Dennis Dickerson
To: Xavier Swamikannu
Date: 9/3/99 11:22AM
Subject: SUSMPs

We will need to send a modified hearing notice. The hearing for SUSMPs will not begin at 9am, rather it will be much later in the day.

Should we calrify it will not be hearing per se, i.e., no formal action by board at the meeting.

Let's discuss

CC: Jorge LEON

From: Xavier Swamikannu
To: Dennis Dickerson
Subject: Re: SUSMPs

We should clarify both the time for hearing the item and that no formal action by the Board will be taken.

I will draft a letter next week.

Part 2.I.G and 2.I.H.

G. Administrative Review

The administrative review process formalizes the procedure for review and acceptance of reports and documents submitted to the Regional Board under this Order. In addition, it provides a method to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action.

1. Storm water program documents, including progress reports, guidelines checklists, BMPs, databases, program summaries, and implementation and compliance schedules, developed by the Principal Permittee or a Permittee under the provisions of this Order, shall be submitted to the Executive Officer or the Regional Board, where required for approval. The process is as follows:

   a. For documents that require Executive Officer's approval, the Executive Officer will notify the Principal Permittee and/or Permittee of the results of the review and approval or disapproval within 120 days. If the Executive Officer has not responded within 120 days following submittal, the Permittee shall notify the Regional Board of its intent to implement the program components as submitted. If after 10 days the Executive Officer has not responded, the Permittee will implement the submitted program and the Executive Officer may not make modifications; and,

   b. Documents that require formal Regional Board approval will undergo public review and comment before Board consideration at a public meeting.

2. If the Executive Officer determines that a Permittee's storm water program is insufficient to meet the provisions of this Order, the Executive Officer shall send a "Notice of Intent to Meet and Confer (NIMC)" to the Permittee, with specific information in support of the determination. The NIMC shall include a time frame by which the Permittee must meet with Regional Board staff. The processes are as follows:

   a. The Permittee, upon receipt of a NIMC, shall meet and confer with Regional Board staff to demonstrate that the Permittee's program is sufficient to meet the requirements of this Order; and, if not, seek clarification on the steps to be taken to completely meet the provisions of this Order. The meet and confer period will conclude with either a notice of program sufficiency to the Permittee, or the

submittal to and acceptance by the Executive Officer of a written "Storm Water Program Compliance Amendment (SPCA)" which shall include implementation deadlines. The Executive Officer may terminate the meet and confer period after a reasonable period due to a lack of progress on issues and may order submittal of the SPCA by a specified date. Failure to submit an acceptable SPCA by the specified date shall constitute a violation of this Order;

b. The Executive Officer will approve or reject the submitted SPCA or an amended SPCA within 120 days. Rejection of an SPCA by the Executive Officer shall state the reasons for the failure to approve the SPCA. A Permittee that receives a rejection of an SPCA shall have sixty (60) days to remedy the specified deficiency and resubmit the SPCA. If the Executive Officer has not responded within 120 days following submittal of an SPCA, the Permittee shall notify the Executive Officer of its intent to implement the SPCA as submitted. If after 10 days the Executive Officer has not responded, the Permittee will implement the submitted SPCA and the Executive Officer may not make modifications;

c. The Permittee shall comply with the terms of the SPCA. The Permittee shall submit reports to the Executive Officer on progress made under the SPCA. The frequency of progress report submittal shall be quarterly unless otherwise prescribed by the Executive Officer. Failure to comply with the terms and conditions of the SPCA shall constitute a violation of this Order and shall be cause for enforcement action by the Regional Board; and,

d. The Executive Officer shall not take enforcement action against a Permittee until the Executive Officer has notified the Permittee in writing that the Administrative Review Process has been exhausted and that the Executive Officer has determined that a violation exists warranting enforcement.

H. Public Review

1. The Principal Permittee shall maintain a current mailing list of interested parties, organized by WMAs, for distribution of documents that require the Executive Officer's approval. The Executive Officer will provide the Principal Permittee with the initial list of interested parties.

2. The Principal Permittee shall distribute for public comment the initial CSWMP, WMAPs, and other storm water program requirements that are submitted to the Executive Officer or the Regional Board for approval.

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R0070134

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R0070136

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1. Countywide Development Planning Guidance

The Principal Permittee, in consultation with the Permittees, shall develop the following development planning guidance materials for use during planning and permitting of all development projects requiring discretionary approval:

a. A model documented system, such as a checklist, for determining priority projects as well as a list of specifically exempt projects not later that January 30, 1998. Priority and exempt projects are defined as follows:

i. Priority Projects are development and redevelopment projects requiring discretionary approval which the Building Official (or equivalent municipal authority) determines may have a potential significant effect on storm water quality.

ii. Exempt Projects are development and redevelopment projects which the Building Official (or equivalent municipal authority) determines will not have a potential significant impact on storm water quality.

The documented system shall consider location of the project with respect to designated environmentally sensitive areas and the slope and erosion potential of the site and surrounding areas.

Each Permittee shall incorporate a substantially similar system into its procedures not later than six months after commencement of its next fiscal year following approval of the of the documented system by the Executive Officer, provided, however, that such approval is issued not later than 90 days prior to the commencement of the Permittee's fiscal year. If such approval is given within 90 days of the commencement of a Permittee's fiscal year, such program shall be implemented in the second fiscal year following approval but in no event shall implementation be later than July 30, 1999.

b. A list of recommended BMPs not later than January 30, 1998. The list of BMPs shall include:

i. Site planning practices;
ii. Post-construction best management practices; and
iii. Redevelopment and infill practices.

Consideration shall be given to the type of development and the potential for storm water pollution when determining the applicability of BMPs. Cost effectiveness, ease of maintenance, and consistency with other environmental mandates may also be considered.

For developments where increased storm water discharge rates will result in an increase in downstream erosion potential, the list of recommended BMPs shall include those BMPs which can be used to maintain peak runoff rates at pre-development levels to the maximum extent feasible.

The list of recommended BMPs shall be submitted to the Regional Board for approval.

c. Standard Urban Storm Water Mitigation Plans (SUSMPs) and guidelines for their preparation not later than six months after Regional Board approval of the BMPs in Part 2.III.A.1.b. The SUSMPs shall incorporate the appropriate elements of the recommended BMPs list. At the minimum, SUSMPs and guidelines shall be prepared for the following development categories:

i. a 100+ home subdivision;
ii. a 10-home subdivision;
iii. a 100,000+ square-foot commercial development;
iv. an automotive repair shop;
v. a retail gasoline outlet;
vi. a restaurant; and
vii. a hillside-located single-family dwelling.

2. Planning Control Measures

Each Permittee shall develop a program on planning control measures for priority projects (Part 2.III.A.1.a) consistent with the programs developed under Part 2.III.A.1.b. & c.. Each Permittee shall initiate implementation of its program not later than six months after commencement of its next fiscal year following approval of the model Standard Urban Storm Water Mitigation Plans by the Executive Officer, provided, however, that such approval is issued not later than 90 days prior to the commencement of the Permittee's fiscal year. If such approval is given within 90 days of the commencement of a Permittee's fiscal year, such program shall be implemented in the second fiscal year following approval but in no event shall implementation be initiated later than July 30, 1999. Each Permittee shall require that the project applicant submit an Urban Storm Water

R0070141

Mitigation Plan appropriate and applicable to the project, and that the Permittee approve the Plan prior to the issuance of any grading or building permit. The Urban Storm Water Mitigation Plan shall incorporate by detail or reference appropriate post-construction BMPs to:

a. Implement, to the maximum extent practicable, requirements established by appropriate governmental agencies under CEQA, Section 404 of the Clean Water Act, local ordinances and other legal authorities intended to minimize impacts from storm water runoff on the biological integrity of natural drainage systems and water bodies;

b. Maximize, to the maximum extent practicable, the percentage of permeable surfaces to allow more percolation of storm water into the ground;

c. Minimize, to the maximum extent practicable, the amount of storm water directed to impermeable areas and to the MS4;

d. Minimize, to the maximum extent practicable, parking lot pollution through the use of appropriate BMPs such as retention, infiltration, and good housekeeping;

e. Establish reasonable limits on the clearing of vegetation from the project site including, but not limited to, regulation of the length of time during which soil may be exposed and, in certain sensitive cases, the prohibition of bare soil; and

f. Provide for appropriate permanent controls to reduce storm water pollutant load produced by the development site to the maximum extent practicable.

The Permittee may refer applicants to the *'California Storm Water Best Management Practice Handbooks,* California Storm Water Quality Task Force, Sacramento, CA (1992)' and its revisions; the Countywide Storm Water Management Plan; *'USEPA Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Issued under the Authority of Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990,* Document No. EPA 840 B 92-002 (1993),'; and similar manuals for specific guidance on selecting post-construction BMPs for reducing pollutants in storm water discharges.

3. Planning Process

In order to integrate storm water management considerations into

C. Program Evaluation Report

1. The Principal Permittee, shall, not later than July 31, 2000, mplete an analysis of the general success of the Five-Year Storm ater Public Education Strategy and identify its accomplishments. Thi eport shall serve as the basis for the next Five-year Storm Water Public Education Strategy that will be part of the ROWD.

2. The Principal Permittee shall, not later than July 31, 2000, and in consultation with the Permittees, prepare and submit a report on the assessment of the effectiveness of the CSWMP components (except that identified in C.1.).

3. The Principal Permittee shall, not later than February 1, 2001, submit a report on the identification of CSWMP components for which performance standards will be developed and implemented during the next term of the permit. The report shall include a schedule of development of performance standards. The performance standards will indicate the level of implementation necessary to demonstrate that efforts are being made to reduce the discharge of pollutants in storm water to the maximum extent practicable. This report will be an integral part of the ROWD.

D. Integrated Receiving Water Impacts Report

The Principal Permittee shall not later than July 31, 2000, prepare and submit an Integrated Receiving Water Impacts Report. The report shall include, but not be limited to a comprehensive analysis of the results of the different monitoring data (land use, mass emissions, critical source, load assessment, receiving waters, and other pertinent studies available), and feasible environmental indicators. It should also include recommendations on future monitoring requirements, e.g., integration of storm water receiving water monitoring with regional receiving water monitoring, if applicable. This report will be an integral part of the ROWD.

R0070143

- Florida
  - 2 ½ years to develop design standard
  - "hundreds" of meetings
  - 29 drafts
  - wide involvement of stakeholders

- Maryland
  - 5-6 years to develop design manual
  - statewide involvement by stakeholders
  - currently undergoing public review
  - [two counties have proceeded with early implementation based on draft documents due to local concerns or significant stream bank de-stabilization—a hydraulic/hydrologic concern more than a water quality concern.]

- Denver Area
  - Development of criteria took over one-year
  - Criteria were developed only as guidance with the MS4 permittees making their own determination a to how and to what extent the criteria would be implemented

  City of Denver has required use of criteria by ordinance, but acknowledge that the actual application of criteria is somewhat subjective.

- Seattle
  - Intitiated development of design standards in 1988
  - Final adopted in June 1992
  - Process incuded wide involvement of stakeholders
  - Two rounds of drafts for public review over a 2 year period
  - Several workshops/meetings – lots of communication

Summary – Those responsible for developing design standards recognized the significance and impact of these requirements.

- In each case development of design standards
  - Reflected the unique climate, geography and environmental needs of the area
  - took 2 years or longer
  - required broad stakeholder involvement
  - recognized that without local buy-in and support, at best, implementation would be inconsistent, and at worst, would lead to litigation.

- In no case did:
  - a regulatory body attempt to unilaterally impose a design standard
  - a program adopt a standard developed by another jurisdiction.
  - any program blindly impose a design standard strictly based on recommendations in the ASCE or WEF manual

The Los Angeles County Municipal Stormwater Permit and Standard Urban Storm Water Mitigation Plans (SUSMPs)

Storm Water NPDES Permit Program Background

- **Municipal Stormwater Permits required by Clean Water Act Amendments - 1987**
  - » **Los Angeles County MS4 Permit Issued - 1990**
  - » **Reissued - LA County 1996**
  - » **Long Beach individual permit -1999**
- **Statutory standard - reduce pollutants to the Maximum Extent Practicable (MEP)**
- **Water quality standards must be attained**

Los Angeles Permit Elements

- Discharge Prohibitions
- Receiving Water Limitations
- Continuation of 1990 Permit Requirements
- Stormwater Management Program
  - » 5 distinct program elements

Stormwater Management Program

- Five Elements
  - » Illicit Connections and Illicit Discharges
  - » Development Planning and Construction
  - » Public Agency Activities
  - » Public Information
  - » Monitoring

Development Planning

- Regulatory requirement
  - » implement and enforce controls for new development / significant redevelopment 40CFR 122.26 (d)(2)(iv)(A)(2)
- Development Planning Model Program
  - » System for designating project as priority

Los Angeles County MS4 Permit Status

- **Model Programs approved by Executive Officer**
- **Development Planning and Construction Permit Requirements**
  - » **Development planning guidance for use with projects requiring discretionary approval**
    - **Model Program for determining priority projects - approved**
    - **List of recommended BMPs for development projects- approved**
    - **Standard Urban Stormwater Mitigation Plans**
    - **Require priority project applicants to submit Urban Stormwater Mitigation Plans as a prerequisite to approval of a project by a Permittee (issuance of grading or building permit)***
      - **(implementation delayed pending approval of SUSMPs)**

Standard Urban Storm Water Mitigation Plans

- Definition
  - » Model guidance document for the selection of post-construction BMPs
- Purpose
  - » To ensure that potential adverse water quality impacts are addressed during project planning
- Method
  - » Affirmative review and approval by a municipality of a written plan

Standard Urban Storm Water Mitigation Plans (continued)

Recent Board Action

- Approved BMPs List for municipalities to select from and require implementation (Resolution No. 99-03)
- Adopted MS4 permit for Long Beach with prospective applicability of SUSMP requirements approved for LA County (Board Order No. 99-060)

Standard Urban Storm Water Mitigation Plans (continued)

- Submitted for Executive Officer approval
  - » Consensus document by Permittees
- SUSMP categories:
  - » 10-99 Home Sub-division projects
  - » 100+ home sub-division projects
  - » 100,000 sq. feet commercial developments
  - » gas stations
  - » restaurant
  - » automotive repair
  - » single family hillside dwelling

Standard Urban Storm Water Mitigation Plans (continued)

Positive Features

- Requires flow management where erosion may occur.
- Provides guidance on structural and source control BMPs.
- Lists "treatment" control BMPs for home sub-divisions and commercial development
  - » "Treatment" - Engineered systems that utilize physical or chemical processes for pollutant removal such as filtration, settling, adsorption etc.

Standard Urban Storm Water Mitigation Plans (continued)

Proposed SUSMPs are limited in scope and effectiveness

- Limit "treatment" BMPs to
  - » 10-99 home sub-division projects
  - » 100+ home sub-division projects
  - » 100,000 sq. feet commercial developments
- Do not contain a numerical design standard for BMP application

Standard Urban Storm Water Mitigation Plans (continued)

- Regional Board hearing on September 16th to consider SUSMPs
- Consider several revisions to the SUSMPs "as submitted"
  - » **1) Require consideration of "treatment" control BMPs for automotive repair facilities, gas stations, restaurants, and hillside single family dwellings**

Standard Urban Storm Water Mitigation Plans (continued)

- Consider several revisions to the SUSMPs "as submitted" (cont'd)
  - » 2) Approve for Los Angeles County a numerical mitigation measure that requires application of "treatment" BMPs to:
    - 85th and lower percentile runoff events based on the ASCE/ WEF method of calculation; or
    - equivalent rainfall criteria for LA County of all events up to and including 0.75 in.; or
  - » 3) Review alternative language provided by some commenters for SUSMP text where it adds clarity or otherwise improves the understanding and readability

Criteria Application

Example - >10 home sub-division

- » **Select source control and structural BMPs from guidance in SUSMP**
- » **Select a set of "treatment" control BMPs from guidance to affect pollutants in total runoff from the first 0.75 inch of rainfall. (Note: No specific BMP or a mandated BMP efficiency standard is prescribed)**
- » **Size BMPs for respective drainage area**
- » **Submit Plan to municipality for approval.**

Criteria Application (continued)

- **Hypothetical "Treatment" Control BMPs to select from:**
  - » **Swale (along parkway)**
  - » **Infiltration basin (at end of swale)**
  - » **Biofilters (around parking lot)**
  - » **Greenbelt (between rear yards)**
  - » **Detention basin (lake)**
  - » **Catch-basin inserts (for trash)**

  (Note: utilize BMPs approved by Board)

Numerical Measure Justification

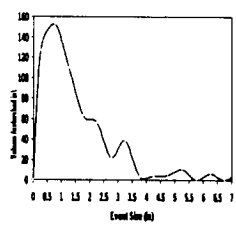
0.75 in Rainfall

- » **Technically defensible**
- » **Alternative sizing criteria based on storm water runoff provided using ASCE/ WEF Method**
- » **Criteria in use by other communities range from 0.5 to 2 inches (TX, FL, WA, MD, CO)**
- » **Criteria in use by Santa Monica, Calabasas, Ventura County, and unincorporated LA County**
- » **Standard is averaged for local communities**

Rainfall Criterion

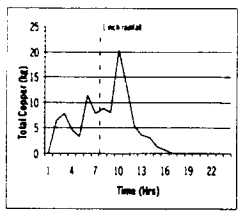
- Eighty-five percent of rainfall events are equal to or less than the criterion
- Further increase in value results in fewer and fewer rainfall events being captured. ("point of diminishing returns")

Cumulative Rainfall Runoff



- Largest volumes of runoff are produced by smaller storms
- Criteria promotes BMP application to smaller more frequent storms

Load Reduction - Example Copper



- Ballona Creek flow from March 25, 1998 storm
- For storm event above criteria < 50 % of copper load is affected.
- Mitigation criteria for new development is a first step

Issue and Analysis

Regional Board's Regulatory authority

- » **Regional Board may "require controls to reduce the discharge of pollutants ...and such other provisions ...determines appropriate.." 33 U.S.C. 342(p)(B)(iii)**
- » **EPA's Interim Permitting Policy authorizes "more specific conditions or limitations to be incorporated into storm water permits as necessary and appropriate" 61 Fed. Register 43761**

Issue and Analysis

Regional Board's Regulatory authority

- » **Administering agency accorded high degree of deference in areas of law they regulate. Chevron v. NRDC (1984) 467 U.S. 837**
- » **EPA has the discretion to determine what pollution controls are appropriate Defenders of Wildlife v. Browner, 9th Circuit Court of Appeals, Sept. 15, 1999**

Issue and Analysis

Would BMPs be ineffective?

- » **Effectiveness is distinct from mitigation measure**
- » **Regional Board Resolution requires "implementation of most effective BMPs", Resolution No. 99-03**
- » **Effectiveness dependent on proper application**
- » **EPA-ASCE National BMP Database**

Issue and Analysis

Would BMPs require costly BMP maintenance?

- » **Maintenance of BMPs essential**
- » **Costs dependant on BMP type**
- » **"When Best Management Practices become Worst Management Practices" - CE News**

Issue and Analysis

- **Numerical criteria**
  - » **A starting point to remove pollutants of concern in storm water**
  - » **Numerical Criteria facilitates BMP sizing and design**
  - » **Pollutant load is reduced - quantification documentation is a concern**
  - » **Pollutant concentration peaks are reduced ("first flush")**
  - » **BMP effectiveness will determine actual removal**

Issue and Analysis

Some assert that Anti-degradation Policy prohibits new development

- » Storm water permits are means to attain TMDLs for impaired waters.
- » NPDES permits authorize conditions on new development but not prohibition

Issue and Analysis

Why a numerical standard now?

- A decade since first implementation of permit
- Understanding of problem has progressed
- Specificity aids BMP sizing and design
- Allows better use of BMP List adopted by Board

STANDARD URBAN STORM WATER MITIGATION PLANS

SUMMARY OF COMMENTS RECEIVED AND RESPONSE

The comments received on the Standard Urban Storm Water Mitigation Plans (SUSMPs) and Regional Board staff response is divided into two sections. The first sections, lists main issues and staff response in detail. The second section summarizes all significant comments received by the Board on SUSMP before December 6, 1999, and the staff response including any actions taken to address the comment.

A. MAIN ISSUES AND RESPONSE

1. **Comment**:The Regional Board lacks regulatory discretion to establish a numerical mitigation measure for storm water treatment.

Response: The municipal storm water permit for Los Angeles County and Cities requires that SUSMPs achieve specific objectives which include to (i) minimize adverse impacts to natural communities; (ii) maximize infiltration to the extent practicable; (iii) minimize parking lot pollution; (iv) provide for appropriate controls to reduce storm water pollutant loads.[1] Staff interprets this provision of the permit, underlying federal law, and the statutory standard of Maximum Extent Practicable (MEP) as requiring SUSMPs to incorporate numerical mitigation measures for development planning projects in order to achieve compliance with water quality standards. Without a numerical mitigation measure, developers will select no treatment BMPs because there will be no BMP sizing guideline. Board Resolution No. 99-03 which states that "The Permittees shall select and require implementation of the most effective BMPs,...." will then be without effect.[2]

The 1987 Clean Water Act amendments give USEPA and States considerable discretion on establishing provisions for implementation in storm water programs.[3] Further, interim USEPA policy guidelines on BMPs for storm water programs explains that the permitting authority can require more specific conditions or limitations to meet water quality

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[1] Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles (Board Order No. 96-054; NPDES No. CAS614001). Part 2. III.A.2)

[2] The Regional Board adopted Resolution No. 99-03 approving BMPs for Development Planning and Development Construction on April 22, 1999.

[3] 33 U.S.C. Section 1342(p)(B)(iii). "require controls to reduce the discharge of pollutants to the maximim extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of pollutants."

standards where adequate information exists.[4] In addition, courts accord administrative agencies a high degree of deference in the areas of law they regulate.[5]

2. **Comment:** Anti-degradation policy prohibits new construction when water quality is already impaired.

Response: The municipal storm water permit in agreement with federal storm water regulations requires controls on new development to reduce storm water pollution. There is no prohibition on new construction.

3. **Comment**: The numerical mitigation criteria mandates the capture of storm water which will require expensive land acquisition cost.

Response: The numerical mitigation measure defines the definite volume of storm water that must be treated for water quality benefits. Treatment is the application of any physical, biological, or chemical method that can be used to remove pollutants in storm water. Providing storage volume for the runoff or capture is one form of treatment. It is not mandatory and other options may be considered such as reducing impervious cover and promoting infiltration.

4. **Comment**: The proposed numerical mitigation measure is not based on science and is an arbitrarily agreed to number in settlement of a lawsuit.

Response: The proposed numerical measures are technically defensible. The measures are based on the principle that most rainfall events are in the smaller range and higher rainfall runoff producing events are less frequent. Designing storm water treatment controls for the smaller events will reduce storm water pollutant loads significantly while optimizing BMP costs. The primary numerical method to determine BMP design criteria is the maximized water quality treatment volume method recommended by the American Society of Civil Engineers (ASCE). The 0.75-inch rainfall event method happens to be also the one that was agreed to in a lawsuit settlement agreement between the NRDC and the County of Los Angeles. The four methods proposed as choices are equivalent variants and in a technical comparison were in agreement to within 10% of one another. It is highly probable that parties that settle a litigation select a numerical criterion that is reasonable and factual.

5. **Comment**: The numerical mitigation measure will require implementation of BMPs that have not been proven to be effective in the region.

Response: The proposed numerical mitigation measure defines the quantity of storm water (volume) that has to be treated to remove pollutants. This criterion does not in anyway describe the effectiveness of BMPs to be used. The effectiveness of any particular BMP is dependent on design parameters and the range for its applications. Physical geography has little influence on the effectiveness of BMPs while proper

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[4] 61 Fed. Register 43761. "The interim permitting approach uses best management practices in first-round strom water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate."

[5] See, e.g., Chevron U.S.A. v. Natural Res. Def. Council, (1984) 467 U.S. 837

maintenance is a big factor. Information on BMP effectiveness can be found in research reports and national BMP databases. The numerical mitigation measure in combination with the effectiveness of a BMP determines the overall annual load of pollutant that can be removed.

6. **Comment**: The post-construction treatment BMPs will require costly maintenance

Response: Treatment BMPs do require proper maintenance and maintenance costs are BMP specific. Poor or non-existent maintenance will result in an ineffective BMP. Information on BMP maintenance costs can be obtained from national databases and reports. See references in the Record of Decision. A cursory review indicates that maintenance costs are reasonable.

7. **Comment**: The Regional Board did not perform an economic analysis required by State and Federal law.

Response: The implementation of a federal regulation does not require separate economic analysis. A relative quantitative comparison performed with similar criteria for storm water management or flood control, sediment removal from construction, combined animal feedlot operations, and State of Washington water quality criteria indicated that the numerical mitigation criteria would cost about three to ten times less. In addition, staff performed BMP cost calculations for an actual site in Los Angeles in the process of development and determined that the mitigation criteria cost is less than 0.5 percent of the project cost.

8. **Comment**: The Regional Board did not provide adequate public notices to interested parties.

Response: Regional Board action was not contemplated at the September Regional Board meeting and thus no public notice was necessary. Nevertheless, Board staff provided a 30-day public notice and mailed a copy to all parties on file. Staff was unable to verify the claim by some that they did not receive copies of the public notice or provide an explanation. Staff will again provide 30 day-notice of the proposed action on the SUSMPs scheduled by the Regional Board for January 6, 2000.

B. SUMMARY OF ALL SIGNIFICANT COMMENTS AND RESPONSE

COMMENTER	COMMENT	RESPONSE	ACTION
General City of Los Angeles, Western States Petroleum Association	1. Conduct first a quantitative review of the basis of designation of selected categories as priority-planning projects.	The categories are designated in the permit and were selected based on risk sources data compiled in the first term of permit implementation.	No action necessary
Los Cerritos Channel Task Force	2. Provide level playing field for unincorporated and incorporated cities within LA County	Four methods of determining the mitigation measure are provided to ensure some flexibility. The methods are equivalent. See ROD	Four equivalent methods included as mitigation criteria in SUSMP

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	3. No other MS 4 permits in California require numerical criteria for runoff mitigation	All MS4 permits are required to have controls on new development and redevelopment that will reduce pollutants to the MEP. The USEPA has identified the lack of specific criteria as a deficiency in its Report to Congress ON Phase II (1999)	No action necessary
SCAG	4. Provide the opportunity for the development of regional BMPs instead of site by site requirements	May be considered by Board in a Resolution	Will suggest interest to Regional Board
SCAG	5. Make the numerical mitigation measure voluntary pilot program for the first two years.	Federal laws and regulations require that controls on new development and redevelopment be enforceable	No action necessary
Santa Monica	6. More studies not necessary to establish mitigation criteria and evaluate BMPs	We agree that there exists sufficient information to establish numerical mitigation criteria and to design BMP for optimum performance and effectiveness.	No action necessary
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	7. Numerical mitigation measure is an unfunded mandate	Implementation of a federal permit program is not an unfunded mandate as described in the State constitution. See memo from legal counsel.	No action necessary
Bellflower, Claremeont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Long Beach, Los Angeles, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Clarita, Santa Fe Springs, Vernon, Whittier, BIA, EAC, New Hall Land and Farming, Long Beach Chamber of Commerce	8. Numerical mitigation measure is not based on sound science	Disagree. Our review of local data and implementation programs in states such as WA, FL, and MD indicates that the approach to establishing numerical mitigation measure is scientific and reasonable. The methods have also been endorsed by national science and engineering associations.	References to important documents provided in the SUSMP. A bibliography of references reviewed for the action is included in the ROD.
Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, , Long Beach, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	9. Treatment controls will be required irrespective of siting factors limiting application.	Site conditions will determine what BMPs are appropriate. A provision for waiver is provided where mitigation may be infeasible. Mitigation banking may be an altemative.	Waiver provision has been included in the SUSMP where impracticability is established.
Covina, Irwindale, La Mirada, Lomita, Norwalk, Whittier	10. Provide sufficient time for Council of Governments to review and comment	Staff will mail and e-mail copies to SCAG for distribution to COGs.	Staff will mail public notice of proposed action to SCAG and COGs.
Cerritos, Diamond Bar	11. Developers will move to build in counties without numerical mitigation measures.	The mitigation measure requirement for new development is based on federal law. Other Regional Boards are likely to develop and evaluate compliance using similar criteria. The USEPA considers the absence of numerical storm water BMP design criteria for new development a deficiency. See USEPA Phase II Final Rule	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, , Long Beach, Lynwood, Maywood, Montebello, Paramount Glendora, , Norwalk Rancho Palos Verdes, Santa Fe Springs, Whittier, Truxaw and Associates, Long Beach Chamber of Commerce	12. BMPs will require costly maintenance	Maintenance of BMPs is essential and strategies to support maintenance activities are discussed in USEPA's Phase II Final Rule.	No action necessary.
Azusa, Claremont, EAC	13. Perform cost benefit analysis	The implementation of federal law does not require a separate cost benefit analysis. Relative cost comparisons and BMP cost calculations performed indicate that the cost of the mitigation measure is reasonable for the water quality benefits it will bring.	No action necessary
Centex Homes, Desert Partners, Bill Ehrlich, FORMA, Engineering Contractors Association, Greystone Homes, John Laing Homes, Mid-cities Escrow, JTL, New Hall Land and Farming, New Urban West, Pace Engineering, Pacific bay Homes, Pacific Soils Engineering, David Placek, Psomas, Ramseyer, Rasmussen, Shea Homes, Sikand, Southern California Contractors, Southern California Ready Mix Concrete Assoc., South Place Corp., SunCal Co., Taylsor Woodrow., Tetra Tech, Van Tilburg and Associates, Warmington Homes, Western Pacific Housing, LA County Supervisor Knabe,	14. SUSMP is stringent enough without the numerical mitigation measure	Without the numerical mitigation measure the SUSMP does not provide adequate guidance on design criteria for BMPs. Thus no treatment BMPs or BMPs inadequately sized may be selected with no benefit to water quality. The USEPA in the preamble to Phase II Final Rule makes the same observation.	No action necessary.
Technical Heal the Bay, American Oceans Campaign, Friends of the LA River, NRDC, Kudo and Daniels, Fusion Films, Santa Monica BayKeeper, Ballona Wetlands Foundation, AHHA, H & K Interiors, Kinsella & Associates, AKERS Entertainment, Ballesteros, Stenstrom-UCLA, Chatten Broan & Assoc., South Bay SurfRider (13 members), Shatz	15. Establish for all municipalities in LA County the 0.75-inch mitigation measure or similar criteria for development planning currently in effect for the unincorporated areas.	The proposed criteria provide for the treatment of 0.75 inch or equivalent volume of runoff from new development for all areas of LA County within the jurisdiction of the Regional Board.	Criteria is made applicable to all MS4 permittees in LA county
Heal the Bay, American Oceans Campaign, Friends of the LA River,	16. Require SUSMPs for development in environmentally sensitive areas	The requirement is included for the City of Long Beach but was not one of the priority categories specifically identified in the LA County MS4 permit.	This category has been added to the SUSMP.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	17. Require mitigation of runoff from parking lots separately in each SUSMP	This is not one of the priority categories specifically identified in the LA County MS4 permit. Commercial categories specifically included have indicated that they are no different than parking lots. In addition, the Coastal Commission has often consulted the Board for appropriate BMPs and criteria.	This category has been added to the SUSMP.

COMMENTER	COMMENT	RESPONSE	ACTION
NRDC	18. Apply SUSMP requirement broadly rather than limit it to seven categories	A BMP checklist is already required for other priority projects. Expanding the SUSMP requirement may be appropriate once TMDLs have been allocated and other significant sources need to be controlled.	Two categories have been added: locations in environmentally sensitive areas, and parking lots.
County of Ventura and cities	19. Include an alternative method based on volumetric and flow which uses capture of annual runoff and peak flow rate control	An equivalent volumetric method is provided based on annual volume capture. Flow rate controls are left to the judgement of the local agency.	Eight five percent treatment of annual runoff volume is provided as an equivalent mitigation criteria.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	20. Define hillside development and not defer definition to the local municipality	Will provide a general definition.	Defined in SUSMP.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	21. Apply requirements for retail gasoline outlets to any facility with a fuelling dispenser.	This is not one of the priority categories specifically identified in the LA County MS4 permit. Expansion of the applicability may be appropriate once TMDLs have been allocated and other significant sources need to be controlled.	No action necessary
WSPA, San Gabriel Basin Water Quality Authority	22. Requirement for infiltration will promote pathways for groundwater and soil contamination	Risks for ground water contamination exist under certain situations. These are identified in a report by the USEPA (1993). Pre-treatment of storm water will reduce such risks. The soil acts as a natural filter and self regenerates	A section is included in the SUSMP describing the limitations of infiltration BMPs.
Truxaw and Associates	23. Promote non structural BMPs	SUSMPs already require source control BMPs in addition to structural BMPs and treatment control BMPs	No action necessary.
Land Tech Engineering	24. Provide design specifications for BMPs based on criteria	Expect that BMP design specification will be developed by the municipalities based on the numerical mitigation measure. Interim BMP design information may be obtained from manuals developed by other states.	No action necessary.
Centex Homes, Engineering Contractors Assoc., John Laing Homes, Land Tech Engineering, Pace Engineering, Pacific Soils Engineering, David Placek, Ramseyer, Rasmusen, Sikand, Southern California Contractors, Southern California Ready Mix Concrete Assoc., Tetra Tech, South Place Corp., Taylor Woodrow, Western Pacific Housing, LA New Car Dealers Ass.	25. Staff proposal requires capture which is not the same as infiltration or treatment	Storm water capture is not mandatory. The proposal only requires that a certain quantity of storm water be treated with BMPs to remove pollutants in one of several ways.	No action necessary.
Vernon, Los Angeles	26. Require similar criteria for USEPA Phase I industrial facilities	The requirements are for new development in selected categories. Expansion to other categories may be considered for the next permit term. Will recommend application to construction permits in the LA Region covered by the State General Storm Water permit for construction activity.	Will propose to the Board to consider in its Resolution that the same
Brash,	27. Filter media is not an effective BMP	Disagree. Filter media are effective BMPs if properly configured. See letter to Brash from RB Executive Officer date Oct. 19, 1999.	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Clarita	28. Provide criteria for flow based controls in addition to volumetric based controls	Flow based controls which are essential to maintain BMP effectiveness, reduce flow velocities, minimize downstream erosion potential, and prevent over bank flooding are left to the judgement of the local agency.	A statement has been included in the SUSMP that flow design criteria be determined by the local agency.
Santa Clarita	29. Limit application of criteria to impervious surfaces	The criterion is applied to the whole area. Credit for the pervious areas is automatically considered through the runoff coefficient. Roofing areas have been excluded for commercial facilities.	No action necessary.
Santa Clarita, EAC	30. Provide greater flexibility in application of the mitigation criteria	The four methods of selecting the numerical mitigatio through criteria and waiver procedures offer sufficient flexibility in application	Provide in the SUSMP four equivalent methods of determining the numerical mitigation measure.
Los Angeles	31. The numerical mitigation measure should be a guidelines and not a requirement for land development	Federal laws and regulations require that controls on new development and redevelopment be enforceable.	No action necessary.
Legal Los Angeles	32. Setting a numerical mitigation measure is a discretionary action. Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA.	The requirements under an NPDES permit are exempt from review under CEQA. Preliminary costing estimates indicate that they are reasonable.	No action necessary.
Los Angeles	33. Identify the regulatory authority, which authorizes the Regional Board to establish the numerical mitigation measure.	Regulatory requirement is found at 40 CFR 122.26 (d)(2)(iv)(A) (2). Statutory authority is at 33 USC 342(p)(B)(iii). See also court's opinion in Defenders of Wildlife v. Browner (No. 98-71080) (9th Cir. 1999) and in NRDC v. USEPA 966 F2d. 1292 (9th Cir. 1992)	No action necessary.
Los Angeles	34. Setting a numerical mitigation measure is a discretionary action. Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA.	The requirements under an NPDES permit are exempt from review under CEQA. Preliminary costing estimates indicate that they are reasonable.	No action necessary.
Western States Petroleum Association (WSPA)	35. Postpone consideration because of inadequate notice.	A thirty-day notice on this action has been provided. A thirty-day notice on the September 1999 Board meeting was provided even though it was not required for a Regional Board Information item.	No action necessary.
Apartment Association, BIA	36. There is no regulatory requirement that there be a numerical measure	Disagree. See detailed explanation under main issues and response.	No action necessary.
NRDC	37. Receiving water limits and anti-degradation policies apply independently from mitigation criteria.	Agree that mitigation standards are separate from the numerical mitigation measure. The Office of Chief Counsel confirms that MS4 programs must meet water quality standards in a memo dated October 14, 1999	No action necessary.
Burke, Williams & Sorenson	38. Provide broad legal authority for the SUSMP requirement	We will include legal citations that are relevant to the jurisdiction of the Regional Board.	Relevant laws are cited in the SUSMP to provide legal justification.
Burke, Williams & Sorenson	39. Delay SUSMP requirements in light of PL 106-74 requiring USEPA to submit reports to Congress.	The USEPA has already submitted the reports to Congress and thus no delay is warranted.	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Monica BayKeeper	40. New development can be prohibited under the Federal Anti-degradation policy if it degrades or adds pollutants to local waters	Disagree. See detailed explanation under main issues and response.	No action necessary.
EAC, Downey, Lakewood	41. Provide authority in the Clean Water Act to regulate flow to address water quality.	The U.S. Supreme Court has held that regulation of flow to protect beneficial uses is within the authority of the Clean Water Act PUD No. 1 v. WA Dept. of Ecology, 511 U.S. 700 (1994)	No action necessary.

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AMERICAN OCEANS CAMPAIGN

September 8, 1999

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, California 90013

RE: Standard Urban Stormwater Mitigation Plans

Dear Mr. Dickerson:

On behalf of the members and Board of Directors of American Oceans Campaign, I submit the following brief comments on the Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted for approval under the Los Angeles County Municipal Stormwater Permit (96-054). This topic will be considered as Agenda Item #14 at the September 16, 1999 meeting of the Los Angeles Regional Water Quality Control Board.

Include a Numerical Mitigation Measure in the SUSMPs.

As currently drafted, the SUSMPs fail to include specific numerical mitigation measures for stormwater. Many of the SUSMPs fail to include even a narrative mitigation measure. Numerically based performance measures are needed to implement an effective stormwater management program that will gain the support of the public. Standard Urban Stormwater Mitigation Plans with measures would assist permittees in selecting appropriate Best Management Practices for managing stormwater and would provide enforcement agencies and members of the public with the benefit of clearer, enforceable standards.

As a minimally acceptable standard, American Oceans Campaign supports the Regional Board staff recommendation to include a numerical mitigation measure for each SUSMP. The staff recommendation for a numerical mitigation measure is to be determined by either:

a. the 85th percentile, 24-hour runoff event determined as the maximized capture stormwater volume for the area, or
b. a historical-record based reference 24-hour rainfall criterion (.75 inch for the Los Angeles County area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

Along with other environmental groups, we believe that the numerical mitigation measure which is derived should be applied within the boundaries of the cities as well as unincorporated areas in Los Angeles County.

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Protect Environmentally Sensitive Areas.

The SUSMPs should follow the precedent established by the recently approved permit for Long Beach City and provide additional protections for environmentally sensitive areas. There are certain areas where the impacts of stormwater have an exceptionally detrimental impact on water quality, habitat, or ecological conditions. These sensitive areas should receive additional protections from the impacts of development and polluted urban stormwater. We agree with other environmental groups that a buffer zone of at least 100 feet should be imposed between any development and an environmentally sensitive area.

Thank you for considering these comments. I look forward to the September 16th meeting where these and other concerns can be raised.

Sincerely,

Ted Morton
California Policy Director

R0070159

SANTA MONICA
BAYKEEPER
Protecting Our Bay
in cooperation with
The Frank G. Wells
Environmental Law Clinic &
the Water Keeper Alliance

September 9, 1999

Post it® Fax Note 7671	Date	# of pages ▶ 4
To Renee Purdew	From Steve Fleischli	
Co./Dept.	Co	
Phone #	Phone # (310) 305-9645	
Fax # 213 576-1625	Fax #	

Members of the Board
Los Angeles RWQCB
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Members of the Board:

The following constitutes the Santa Monica BayKeeper's comments relative to the Board's consideration of the Standard Urban Storm Water Mitigation Plans under the Los Angeles County Municipal Storm water permit (hereinafter "SUSMPs") The BayKeeper believes the SUSMPs for new development provided by the County do not comply with federal requirements. Significant changes are needed to ensure new development does not cause or contribute to further degradation of local waters.

In summary, BayKeeper believes that the staff's proposal of a 0.75" standard for storm water treatment is more than reasonable, especially given that legal requirements dictate a far more restrictive standard for new development covered under a municipal storm water permit.

1. New Development May Not Degrade Local Waters

Federal Antidegradation requirements demand that discharges must maintain and protect existing water quality, unless certain economic considerations apply. See 40 CFR 131.12 (a)(2), see also, US EPA Region 9 Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12, at 1-2 (June 3, 1987). In addition, the regulations provide that "the State shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources...." Id. Storm water runoff (point or nonpoint) is not exempt from these requirements. See e.g. SWRCB Antidegradation Policy Implementation for NPDES Permitting, at 3 (May 1990). Federal guidance further clarifies that "[a]ctions covered by antidegradation provisions include, but are not limited to ... issuance of permits for urban runoff.[and] ... increases in the discharge of pollutants from point sources due to ... municipal growth [and] ... new sources." Region 9 Guidance at 2.

Because of these requirements, new development must be regulated in a manner which does not allow lowering of water quality, unless certain economic considerations are found.[1] Moreover, for

[1] One exception to the rule is where the lowering of water quality is necessary to accommodate important economic or social development. There is no information in the administrative record to suggest that this standard has been met. Indeed, BayKeeper believes it is impossible to meet this standard given the present state of California's economy and the extremely low unemployment rates in the region.

P.O. Box 10096, Marina del Rey, CA 90295 / Telephone: 310.305.9645 / Fax: 310.305.7985
Web Address: smbaykeeper.org / E-mail: info@smbaykeeper.org / Pollution Hotline: 1-800-HELPBAY

303(d) listed pollutants, the development action is subject to absolute prohibition. See Region 9 Antidegradation Guidance at 10.

Unfortunately, neither of these standards is met by the proposed SUSMPs The proposed SUSMPs completely fail to address how water quality standards will be achieved. This is suggested without even the benefit of numeric mitigation measures, as Board staff has proposed. The proposed language in all of the SUSMPs includes only the following text, which fails to address these concerns:

> Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion

For the above reasons, the BayKeeper believes the Regional Board should amend the SUSMPs to reflect the requirements of federal law. It is nonsensical to limit new development runoff based solely on flow rather than water quality considerations. It is more absurd to do so only where erosion is a consideration – a problem which does not plague the myriad concrete lined rivers within Los Angeles County.

We suggest the deletion of the above County-proposed language and the addition of the following language in addition to the Regional Board staff's proposal.

> Regardless of volume, storm water runoff from new development shall not increase pollution loading above pre-development levels.

This should also be recognized without regard to the seven categories suggested in the proposed SUSMPS. This requirement should apply to ALL new development projects.

For impaired waterways, addressing this problem now will eliminate the need for future retrofits of these new developments once TMDLs are developed for pollutants impairing local waters. Such reactive measures could be far more costly than proactive handling of new development controls. For relatively clean waters, this may very well prevent them from becoming impaired (and thus requiring TMDLs) because of new development.

2. New Development May Not Add Any Additional Pollutants to Impaired Waterways

Because Santa Monica Bay, San Pedro Bay, and their tributaries have been found by the Regional Board, State Board, and EPA to be impaired with pollutants that are discharged from municipal storm water systems, including, among others, copper, zinc, lead, nickel, mercury, fecal contamination, and nutrients, the performance standards for new development cannot ignore the Clean Water Act's clear prohibition on the permitting of "new sources" of impairing contaminants into an already impaired waterbody. The federal regulations state that:

> No permit may be issued . . . (I) [t]o a new source or new discharger, if the discharge from its construction or operation will cause or contribute to the violation of water quality standards.

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40 C.F.R. § 122.4(i). The one exception to that prohibition is applicable only after a pollutant load allocation for the particular problem pollutant is completed and there is an available allocation for the new source.[2] Id. "New sources" are defined as "any building, structure, facility, or installation from which there is or may be a 'discharge of pollutants' . . . ." 40 C.F.R. § 122.2. "New dischargers" include "any building, structure, facility, or installation: (a) from which there is or may be a 'discharge of pollutants' . . . ." Id. "Discharges of pollutants" include "surface runoff which is collected or channelled by man; discharges through pipes, sewers, or other conveyances owned by a State[,] municipality or other person which do not lead to a treatment works . . . ." Id. Thus, that prohibition precludes both new outfalls as well as any new source, such as a building or new development, which would discharge pollutants to an existing outfall (such as through a municipal storm drain system).

It is important to note that this requirement does not prohibit new development. It does, however, dictate that any new development or new building projects must be designed in such a way so as not to contribute any impairing pollutants to our Bays or other impaired tributaries. Hence, any new developments or buildings must review the feasibility of including in their designs features that would eliminate any discharge of storm water from their footprint or otherwise eliminate the presence of copper, zinc, lead, nickel, mercury, fecal contamination, nutrients and other potentially impairing pollutants in storm water flowing off the site.

Unfortunately, the proposed SUSMPs for new development are entirely inconsistent with these binding federal requirements. Indeed, in the context of Los Angeles County's storm drain systems, which already contribute copper, zinc, lead, nickel, mercury, fecal contamination, nutrients and other pollutants that are impairing the Bay and local creeks, the performance standards for new development and analogous components of the County's municipal storm water permit should largely be driven by this baseline prohibition.

3. Water Quality Criteria Must be Developed for New Development

In addition to ensuring that water quality is not lowered because of contributions from new development, federal requirements require that numeric limits must be placed on those pollutant loads which are causing or contributing impairment of water quality. 40 CFR 122.44. As was stated above, there are numerous pollutants impairing beaches, rivers and lakes within Los Angeles County. Contributions of all of these should be regulated with numeric effluent limits.

Interestingly, even the present numeric mitigation proposal by Regional Board staff is performance based, rather than water quality based. The Municipalities which oppose these requirements fail to recognize that the Clean Water Act focuses not only on technology and performance based standards, but – most significantly – targets achievement of water quality standards through water quality based requirements. In this regard, the Regional Board would be fully justified in not only imposing staff's suggested numeric mitigation measures, but numeric effluent limits as well.

[2] In Los Angeles County, it should be clear that this exception must fail because there are no completed TMDLs within the region.

4. BayKeeper Supports RWQCB Staff's Changes to the SUSMPs

BayKeeper supports staff's proposal to add consideration of "treatment control" BMPs to SUSMPS Section 3. Indeed, BayKeeper believes it will be nearly impossible to achieve the requirements of the Clean Water Act without this minimum level of BMP. BayKeeper also supports staff's proposed minimum numeric mitigation measures for new development. These numbers correlate with those numbers in place for the County of Los Angeles, which were the result of years of litigation – and significant compromise by the environmental community.

5. Other Issues

Despite the above deficiencies, BayKeeper is supportive of some of the other provisions of the SUSMPs. For example, it is appropriate for new restaurants to be required to design fixed locations (with grease traps) for equipment and accessory washing. It is also appropriate to require that these systems be connected to the sanitary sewer, rather than allowing them to drain to storm. Time and time again BayKeeper staff and volunteers have been contacted regarding illegal restaurant mat washing throughout the County. Public education only goes so far. A blanket requirement for new restaurants is by far the most efficient manner of handling this ubiquitous problem.

BayKeeper is also supportive of mandatory requirements for automotive repair shops and retail gasoline outlets. BayKeeper, however, questions how it will be determined that it is not "feasible" to construct cover for areas such as maintenance areas and material storage areas. Because of the high likelihood of contaminants from these areas, BayKeeper believes only a very limited exception should be given for lack of covering.

Sincerely,

Steve Fleischli
Executive Director

for Xavier

STATEMENT OF EDUARDO OLIVO
(ASSISTANT CITY ATTORNEY, CITY OF VERNON)
TO REGIONAL QUALITY CONTROL BOARD

SUSMP - September 16, 1999

As you may be aware, the City of Vernon has been involved with the L.A. River Watershed Management Committee since 1995 and has participated in a number of subcommittees including the SUSMP subcommittee. The question of exactly how to reduce the level of pollutants from stormwater has been at the forefront of these discussions.

With regard to the SUSMPs there has been much debate over the contents and meaning of these documents. By far, the most important topic of debate has been with regard to stormwater mitigation. During the course of development, the stormwater mitigation requirements of the SUSMPs have taken many forms. Early on, the subcommittee discussed whether the plan should contain prescriptive requirements for mitigation or general guidelines for BMP applications. Eventually, a hybrid version emerged. The County proposed a version that included 0.75 mitigation requirement.

I am informed that subcommittee members inquired as to how the number was derived and were told that it was designed to capture all of the runoff from a certain percentage of all storm events (I believe 85%). Nevertheless, there was apparently no real consideration over how this related to actual pollutant

loads, or how this requirement would impact the beneficial uses of the receiving waters.

It is the City of Vernon's opinion, and I believe that the majority of permittees share this opinion, that it is bad public policy and improper to require major structural treatment BMPs without first determining that these BMPs will actually have the intended effect. A recently released document from the Southern California Coastal Water Research Project reiterates this fact by stating:

> Best Management Practices ("BMPs") have been, and still are, being applied without regard to whether the change in stormwater quality will have any meaningful impact on beneficial use protection. Stormwater managers need to know which BMPs are effective at reducing loads and concentrations for individual constituents. Next, managers need to assess what the most efficient use of BMPs within their watershed will be whereby the greatest improvement in stormwater quality is achieved at the most reasonable cost. Finally, there will need to be an evaluation of these expenditures on BMPs and improvement in stormwater quality will promote beneficial use protection.

The SUSMPs provide a laundry list of BMPs that could be used to control pollutants in stormwater, yet few if any of these BMPs have ever been evaluated. The cost of implementing these BMPs on a county-wide basis will be many millions of dollars over the life of the permit, and it is improper to mandate such expenditures without first having a good idea of the actual benefits of these programs.

In the past, Vernon has requested BMP implementation accompanied by an investigation of BMP effectiveness combined with a receiving water study. In this way, structural treatment BMPs will only be required for those developments that, based upon actual evidence, present a clear stormwater pollution threat. Such information or evidence is needed in order to avoid arbitrary and capricious decision-making by this Board. An EIR, which evaluates the environmental impacts of this Board's decision, should also be prepared.

In closing, it appears that we are all in favor of reducing pollutants in stormwater. Nevertheless, the challenge is to do so in a legal manner and without causing undue economic disruption. This can be accomplished with a sound scientific approach which will define the problem in such a way that we can achieve the greatest environmental benefit possible with the limited funds available.

5.STATEMT.RQB

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COMMENTS ON PROPOSED STANDARD URBAN STORM WATER MITIGATION PLANS (SUSMPs)

Los Angeles Regional Water Quality Control Board
September 16, 1999

Presented by:
Natural Resources Defense Council
Heal the Bay
Santa Monica Baykeeper
Friends of the Los Angeles River
American Oceans Campaign

Outline of Comments in Support of Staff's Recommendation Regarding Approval of SUSMPs with Numeric Performance Standard

I. The Los Angeles Region Needs the Protection Provided by the SUSMPs Targeted to Treat or Infiltrate Substantial Quantities of Runoff from New and Redevelopment

- A. The Region's Severe Storm Water Problem
- B. The Role of New and Redevelopment in Creating the Problem

II. The Proposed Numeric Performance Standard Are Based on Careful, Expert Analysis and the Experience of Municipalities Across the Country

- A. Other Municipalities Across the Country are Adopting Similar Standards
- B. The Proposed Standard was Tailored to Local Conditions by Experts

III. The Permit and the Clean Water Act "MEP Standard" Provide a Strong Legal Foundation for the Staff's Proposal

IV. Staff's Proposal Must be Strengthened Further to Address Issues of Coverage and Required Water Quality-Based Limits

- A. Staff's Proposal Should Apply to a Broader Scope of Projects
- B. Federal Clean Water Act Anti-Degradation Requirements
- C. Clean Water Act Prohibition on New Sources to Impaired (303(d) listed) Waters
- D. Clean Water Act Prohibition on Discharges that "Cause or Contribute" to Violation of Water Quality Standards

I.

THE LOS ANGELES REGION NEEDS THE PROTECTION PROVIDED BY THE SUSMPs *AND* A NUMERIC PERFORMANCE STANDARD

LOS ANGELES AREA WATERS ARE EXTREMELY POLLUTED

- **The LA region has been recognized by experts and government officials as having perhaps the most severe storm water pollution problem in the Nation**

[*Los Angeles Times* (September 5-6, 1999)]

- **Southern California Coastal Water Research Project reports that storm water and urban runoff are the leading source of water pollution in the LA area, and that storm water pollution for pollutants of concern has increased between two and seven hundred percent during the last two decades.**

[SCCWRP Annual Reports; see also *Los Angeles Times*, supra]

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CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

- **EPA officials have stated that the LA region lags behind "virtually everyplace" in the nation in reducing storm water pollution.**

  [Id.]

- **Los Angeles, while covering a small part of the land area of the State, is home to over 50% of all impaired waters in California.**

  [1998 California Section 303(d) List]

THE ROLE OF NEW AND REDEVELOPMENT IN CREATING THE PROBLEM

- Storm water pollution has two main causal components, increased volume and velocity of surface runoff and the concentration of pollutants in runoff.
- Development contributes directly to both factors.
- In particular, by creating impervious surface, development has dramatic effects on increasing the quantity and quality of storm water runoff:

COMPARE...

A 1-inch rainstorm on a 1-acre natural meadow typically produces:	The same storm on a 1-acre paved parking lot produces:
218 cubic feet of runoff (enough to fill a standard office to a depth of 2 feet)	3,450 cubic feet of runoff, nearly sixteen times the meadow (and enough to fill three offices completely)

- **On a larger scale such as the LA area, the impact is even more dramatic, with pre- and post-development discharges in a watershed increasing by 200 times or more [e.g., Des Plaines River, Illinois].**

  [Source: Storm Water Strategies: Community Responses to Runoff Pollution (NRDC, 1999)]

II.

THE PROPOSED NUMERIC PERFORMANCE STANDARD IS BASED ON CAREFUL, EXPERT ANALYSIS AND THE EXPERIENCE OF MUNICIPALITIES ACROSS THE COUNTRY

STANDARDS LIKE THOSE PROPOSED BY STAFF ARE NOW ESSENTIAL

- **"A fundamentally different approach toward development [is] needed to reliably protect streams and other aquatic resources."**

  [Site Planning for Urban Stream Protection, (Center for Watershed Protection), 1995]

- **"...Structural best management practices (BMPs) for stormwater quality enhancement is the cornerstone of stormwater management in newly developing and redeveloping urban areas."**

  [Urban Runoff Quality Management, American Society of Civil Engineers]

- Structural BMPs have been thoroughly tested and are highly effective.

  Common storm water treatment methods, including wet and extended-detention ponds, oil separators, vegetated swales and filter strips, constructed wetlands, various infiltration practices, and media filters can capture 75% to as much as 90% of the solids and lead.

  Copper and zinc reductions of half or more are the rule in these facilities.

  Infiltration can stop the discharge to surface waters of more than 95% of the solids, metals, and bacteria.

- Cities Across the Country are implementing structural stormwater control requirements similar to or more stringent than that proposed by Staff.
  - ✓ Alexandria, Virginia (zero pollutant loading standard)
  - ✓ Montgomery County, Maryland (treatment for 1-inch storm)
  - ✓ Denver, Colorado (80th percentile runoff event)
  - ✓ Santa Monica, California (1-inch/24 hour parking lot standard)
  - ✓ County of Los Angeles (.75 inch/broader scope of subject development)

THE STANDARD PROPOSED BY STAFF HAS BEEN TAILORED TO LOCAL CONDITIONS BY EXPERTS

- Bases of the standard:
  - ✓ Consent Decree in *NRDC/Baykeeper v. Los Angeles County*
  - ✓ Dr. Richard Horner, national storm water expert
  - ✓ County of Los Angeles Experts (Woodward-Clyde)
  - ✓ Independent experts from Camp Dresser and McKee
  - ✓ Empirical data from leading texts (California Storm Water BMP handbook, STORM model)

- Proposed Standard is Less Stringent than NRDC Experts Believe Necessary
- Proposed Standard is Less Stringent than Adopted by County

III.

THE PERMIT AND THE CLEAN WATER ACT "MEP STANDARD" PROVIDE A STRONG LEGAL FOUNDATION FOR STAFF'S PROPOSAL

- The Clean Water Act specifically contemplates structural controls

  [40 C.F.R. Section 122.26]

- MEP Standard places burden on dischargers to implement BMPs unless they can show they are unnecessary:
  - ✓ "[A Discharger] shall have the burden of showing that it has met the "maximum extent practicable" standard in proposing or rejecting BMPs for implementation."

    [NRDC/BayKeeper v. Caltrans, United States District Court, Central District of California (No. CV 93-6073-ER)]

- 1996 Storm Water Permit for Los Angeles County provides:
  - ✓ SUSMPs and guidelines for their preparation must be developed. [Section II.A.1.C (page 34)];
  - ✓ "at the minimum, SUSMPs and guidelines shall be prepared for the following development categories [those at issue in Staff's proposal]."
  - ✓ all permittees must "implement [ ] a program for planning measures consistent with the [SUSMPs]." [Section III.A. and A.2]

IV.

STAFF'S PROPOSAL MUST BE STRENGTHENED FURTHER TO ADDRESS ISSUES OF COVERAGE AND REQUIRED WATER QUALITY-BASED LIMITS

MORE PROJECTS MUST BE COVERED

- Staff's Proposal would apply to a narrow slate of projects
  - ✓ An Additional SUSMP for Environmentally Sensitive Areas is Necessary
  - ✓The County of Los Angeles is applying the treatment/infiltration standards to a broad array of development projects.

WATER-QUALITY BASED LIMITS ARE ALSO NECESSARY

- **The SUSMP standards are performance-based and do not represent water quality-based effluent limits, which may impose more stringent requirements on development.**
- **Many provisions of law may require that no new development be authorized when it will impact polluted waters and/or that additional limits be imposed so that discharges do not "cause or contribute" to violations of water quality standards.**

- ✓ **Federal Clean Water Act Anti-Degradation Requirements**
- ✓ **Clean Water Art Prohibition on New Sources to Impaired (303(d) listed) Waters**
- ✓ **Clean Water Act Prohibition on Discharges that "Cause or Contribute" to Violation of Water Quality Standards.**

V.

CONCLUSION

Standard Urban Storm Water Mitigation Plans (SUSMPs)

Xavier Swamikannu
California Regional Water Quality Control Board, Los Angeles Region
September 16, 1999
424th Regular Board Meeting

Storm Water Program Background

- Clean Water Act Amendments - 1987
- MS4 Permit Issued - 1990; Reissued - LA County 1996 and Long Beach 1999
- Statutory standard - reduce pollutants to the Maximum Extent Practicable (MEP)
- Water quality standards must be attained

Development Planning

- Regulatory requirement
  - » implement and enforce controls for new development / significant redevelopment 40CFR 122.26 (d)(2)(iv)(A)(2)
- Development Planning Model Program
  - » System for designating project as priority
  - » Master List of BMPs
  - » Standard Urban Storm Water Mitigation Plans
  - » Guidelines on storm water for CEQA documents
  - » Information program for developers

Standard Urban Storm Water Mitigation Plans

- Definition - Model guidance document for the selection of post-construction BMPs
- Purpose - To ensure that potential adverse water quality impacts are addressed during project planning
- Method - Affirmative review and approval by a municipality of a written plan

Standard Urban Storm Water Mitigation Plans (continued)

Recent Board Action

- Approved BMPs List for municipalities to select from and require implementation (Resolution No. 99-03)
- Adopted MS4 permit for Long Beach with prospective applicability of SUSMP requirements approved for LA County (Board Order No. 99-060)

Standard Urban Storm Water Mitigation Plans (continued)

- Submitted for Executive Officer approval
- Consensus document
- SUSMP categories:
  - » 10-99 Home Sub-division projects
  - » 100+ home sub-division projects
  - » 100,000 sq. feet commercial developments
  - » gas stations
  - » restaurant
  - » automotive repair
  - » single family hillside dwelling

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Standard Urban Storm Water Mitigation Plans (continued)

Positive Features

- Requires flow management where erosion may occur.
- Provides guidance on structural and source control BMPs.
- Lists "treatment" control BMPs for home sub-divisions and commercial development
  - » "Treatment" - Engineered systems that utilize physical or chemical processes for pollutant removal such as filtration, settling, adsorption etc.

Standard Urban Storm Water Mitigation Plans (continued)

Deficiencies

- Limit "treatment" BMPs to
  - » 10-99 Home Sub-division projects
  - » 100+ home sub-division projects
  - » 100,000 sq. feet commercial developments
- Omit numerical mitigation measure for BMP application

Recommendation No. 1

- Require consideration of "treatment" control BMPs for automotive repair facilities, gas stations, restaurants, and hillside single family dwellings

Recommendation No. 2

- Approve for Los Angeles County a numerical mitigation measure that requires application of "treatment" BMPs to:
  - » 85th and lower percentile runoff events based on the ASCE/ WEF method of calculation; or
  - » equivalent rainfall criteria for LA County of all events up to and including 0.75 in.; or

Recommendation No. 3

- Review alternative language provided by some commenters for SUSMP text where it adds clarity or otherwise improves the understanding and readability

Criteria Application

Example - 100+ Home sub-division

- » Select source control and structural BMPs from guidance in SUSMP
- » Select a set of "treatment" control BMPs from guidance to affect pollutants in total runoff from the first 0.75 inch of rainfall. (Note: No BMP or Efficiency is prescribed)
- » Size BMPs for respective drainage area
- » Submit Plan to municipality for approval.

Criteria Application (continued)

- Hypothetical "Treatment" Control BMPs to select from:
  - » Swale (along parkway)
  - » Infiltration basin (at end of swale)
  - » Biofilters (around parking lot)
  - » Greenbelt (between rear yards)
  - » Detention basin (as a lake)
  - » Catch-basin inserts (for trash)

  (Note: BMPs approved by Board)

Issue and Analysis

Inadequate Public Notice

- » Provided 30 day notice where none is required
- » Mailed notice to all interested parties on file
- » Noticed and conducted a technical workshop on August 10 prior to the hearing notice to inform and educate

Issue and Analysis (continued)

Inappropriate Numerical Measure

0.75 in Rainfall

- » Technically defensible
- » Alternative sizing criteria based on storm water runoff provided using ASCE/ WEF Method
- » Criteria in use by other communities range from 0.5 to 2 inches (TX, FL, WA, MD, CO)
- » Criteria in use by Santa Monica, Calabasas, Ventura County, and unincorporated LA County
- » Standard is averaged for local communities

Rainfall Criterion

- Eight-five percent of rainfall events are equal to or less than the criterion
- Further increase in value results in fewer and fewer rainfall events being captured. ("point of diminishing returns")
- Criterion is averaged for local communities

Runoff Criterion

The Design Storm

$$P_o = a.C.P_A$$

P_o - Maximized water quality "treatment" volume

a - "Treatment" volume coefficient

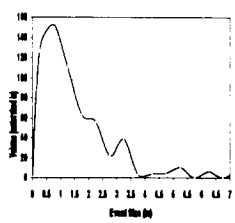
C - Area runoff coefficient

P_A - Mean storm precipitation volume

Range in coastal CA for 85% annual runoff "treatment"

- » 0.12 inch - 0.86 inch

Cumulative Rainfall Runoff



- Largest volumes of runoff are produced by smaller storms
- Criteria promotes BMP application to smaller more frequent storms

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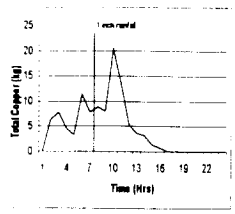
Load Reduction - Example Copper



- Ballona Creek flow from March 25, 1998 storm
- For storm event above criteria < 50 % of copper load is affected.
- Mitigation criteria for new development is a first step

Issue and Analysis (continued)

Inappropriate Numerical Measure

Ineffective BMPs

» Effectiveness is distinct from mitigation measure

» Regional Board Resolution requires "implementation of most effective BMPs", Resolution No. 99-03

» Effectiveness dependent on proper application

» EPA-ASCE National BMP Database

Staff Analysis (continued)

Inappropriate Numerical Measure

Mandates Capture of Storm Water

» Intent is for a set of "treatment" BMPs to be applied to definite quantity of rainfall or runoff.

» Storm water capture is one type of application of a "treatment" BMP whose use may be not appropriate where space is limited.

» Will modify language to clarify the intent.

Staff Analysis (continued)

Inappropriate Numerical Measure

Costly BMP Maintenance

» Maintenance of BMPs essential

» Costs dependant on BMP type

» "When Best Management Practices become Worst Management Practices" - CE News

Numerical Criteria

- A starting point to remove pollutants of concern in storm water Criterion facilitates BMP sizing and design
- Pollutant load is reduced
- Pollutant concentration peaks are reduced ("first flush")
- BMP effectiveness will determine actual removal

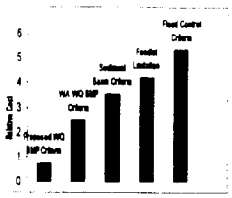
Staff Analysis (continued)

No Economic Analysis

» None required when implementing a federal regulation

» Economically reasonable when compared with similar criteria for storm water

Relative Cost Comparison



- Relative cost much less than similar storm water criteria.
- Comparable criteria for wet regions, e.g., Pacific Northwest is higher.

Staff Analysis (continued)

SUSMPs For Too Few Priority Categories

» Phase 1 industrial facilities not listed as priority category in MS4 permits

» Other types of commercial and state/ federal facilities are not listed as priority category in MS4 permits

» Ecologically Sensitive Areas is a priority category in city of Long Beach MS4 permit

Staff Analysis (continued)

Anti-degradation Policy Prohibits New Development

» Storm water permits are means to attain TMDLs for impaired waters.

» NPDES permits authorize conditions on new development but not prohibition

Conclusion

Why Now?

- A decade since first implementation
- Public and media awareness
- Science has progressed
- Specificity aids BMP sizing and design
- Give effect to BMP List adopted by Board
- Permit requires implementation now

Issue and Analysis

Regulatory authority

» Regional Board may "require controls to reduce the discharge of pollutants ...and such other provisions ...determines appropriate.." 33 U.S.C. 342(p)(B)(iii)

» EPA's Interim Permitting Policy authorizes "more specific conditions or limitations to be incorporated into storm water permits as necessary and appropriate" 61 Fed. Register 43761

» Administering agency accorded high degree of deference in areas of law they regulate. Chevron v. NRDC (1984) 467 U.S. 837

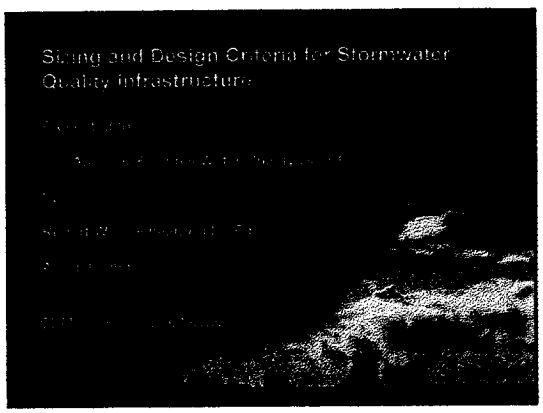
Issue and Analysis

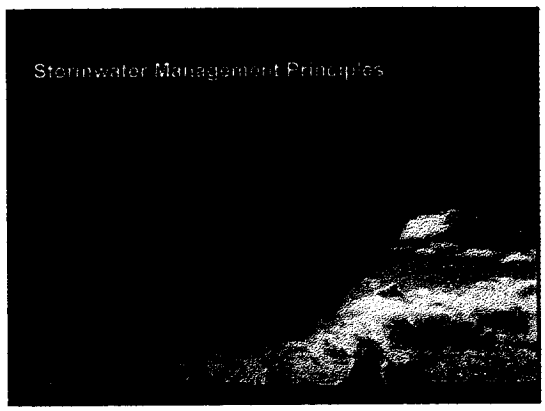
Numerical Mitigation Measure

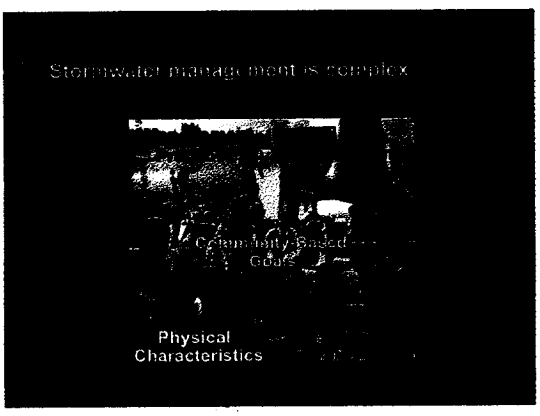
Unfunded Mandate

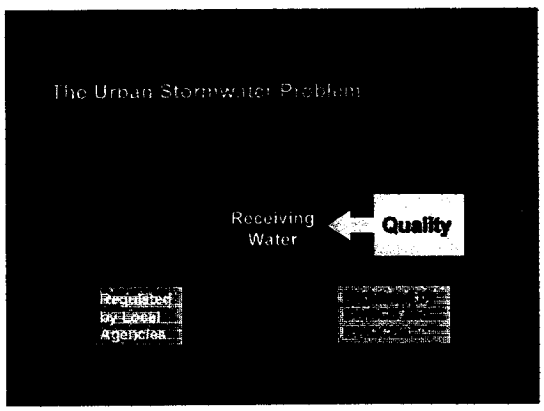
» State Constitution provision does not cover permits issued imposing federal requirements

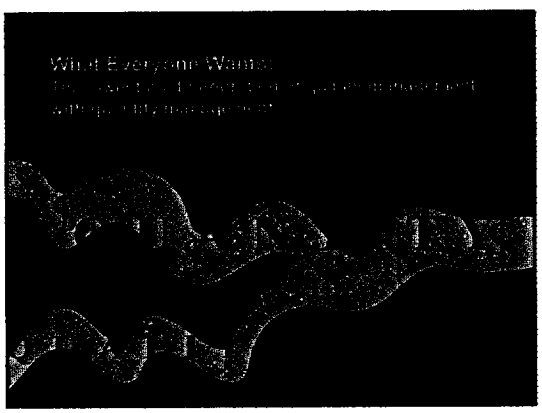
» Exempt where the "statute implemented a federal law or regulation and resulted in costs mandated by the Federal government, Govt. Code 17556(c)

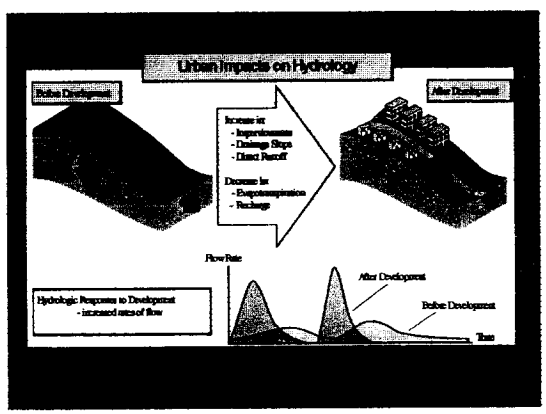

Sizing and Design Criteria for Stormwater Quality Infrastructure


Stormwater Management Principles


Stormwater management is complex
Community-Based Goals
Physical Characteristics


The Urban Stormwater Problem
Receiving Water
Quality
Regulated by Local Agencies


What Everyone Wants:


Urban Impacts on Hydrology
Before Development
After Development
Increase in:
- Impervious areas
- Drainage Stops
- Direct Runoff
Decrease in:
- Evapotranspiration
- Recharge
Flow Rate
After Development
Before Development
Time
Hydrologic Response to Development
- increased rates of flow

R0070177

Stormflow Impacts

- 100 year peak flow increases 2 X
- 15 year peak flow increases 3 X
- 2 year peak flow increases **57 X**

Typical Pollutant Concentrations in Urban Runoff

Suspended Solids	**10-1000 mg/L**
BOD_5	**2-20 mg/L**
NH_3	**1-5 mg/L**
Oil & Grease	**0.3-1.0 mg/L**
Pb	**? - 94 micro g/L**
Cr	**? - 5 micro g/L**
Cu	**? - 76 micro g/L**
Zn	**? - 158 micro g/L**
Fecal Coliform	**10-10^6 C/ mL**

Stormwater Flow Impacts

- Channel scours destroys ecologic habitat
- Sedimentation smothers biota
- Changed hydroperiod affects estuary ecology

The Fact Is:

Simply reducing pollutants in the runoff to the Maximum Extent Practicable will probably not result in significant improvement to the ecologic condition of the receiving waters

Flow management is also required

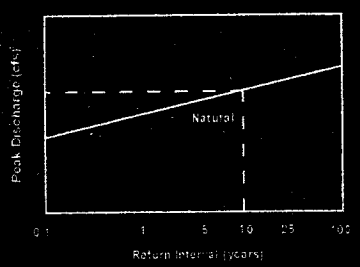
Communities Can Achieve the Most Cost Effective Integration of Quality Management With Quantity Management in Developing Areas



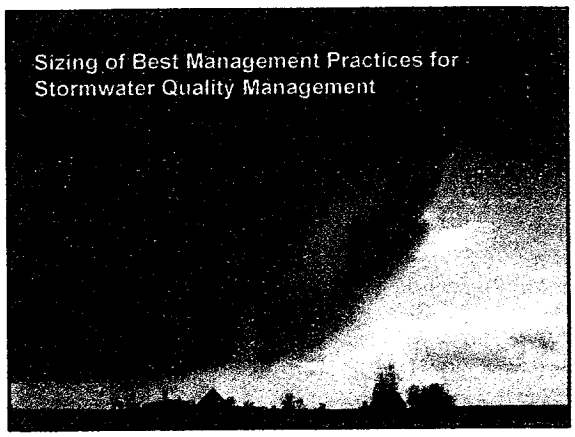
For the vast majority of municipalities, the ecosystems of urban waterways are governed far more by hydrology than by water quality



Minor Modifications in Drainage Infrastructure Design and Operation for Flood Protection Will Address Both Quantity and Quality Impacts



Sizing of Best Management Practices for Stormwater Quality Management



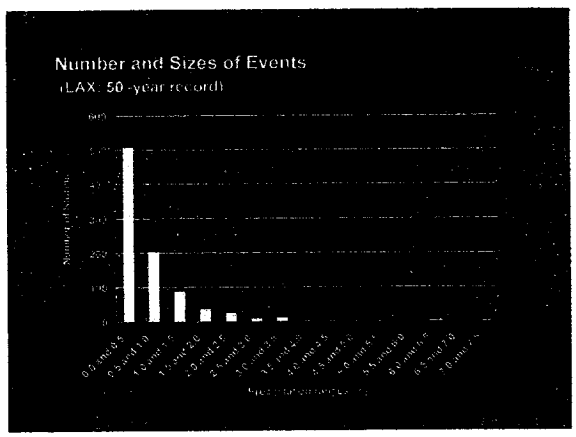
Selecting a WATER QUALITY Design Storm

Small storms account for most of the runoff and pollutant load from watersheds and are the most affected by urbanization

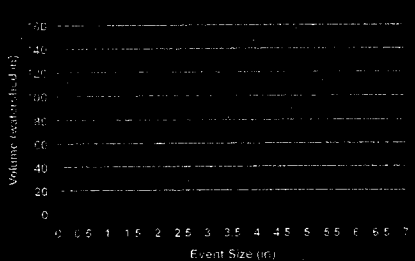




Number and Sizes of Events
(LAX, 50-year record)



Approximate Runoff Volume vs. Event Size
(LAX, 50-year record)



BMP Sizing Options

- Percent Capture of Annual Runoff
  - California BMP Handbook
- Maximized Water Quality Capture Volume
  - ASCE/WEF Manual of Practice
- Capture of Arbitrarily Selected Event
  - Typically a Modified Version of the Rational Method
  - Numerous Locales

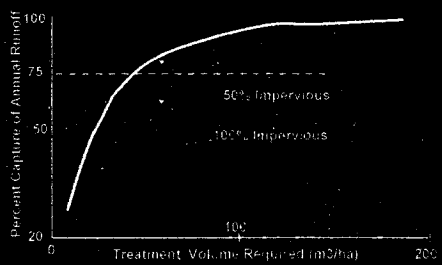
Option 1:

Percent Capture of Annual Runoff

- Requires analysis of long-term rainfall records, preferably from multiple gages
- Determination of detention time required
  - Typically 24 - 48 hours for optimized suspended solids removal
- Storage, Treatment, Overflow, Runoff Model used to determine percent annual runoff vs basin size
  - Based on percent impervious area and detention time

Percent Capture of Annual Runoff

(CA BMP Handbook for LA Region)



Option 2:

Maximized Water Quality Capture Volume

- Determination of 80th percentile runoff event
- Requires analysis of long-term rainfall records, preferably from multiple gages
  - Calculate average daily rainfall for period of record

Maximized Water Quality Capture Volume

$$P_o = a \cdot C \cdot P_A$$

Where:

P_o = Maximized Water Quality Capture Volume (in.)

a = Capture Volume Coefficient

C = Watershed Runoff Coefficient

P_A = Mean Storm Precipitation Volume (in.)

Maximized Volume for California

$$P_o = a \cdot C \cdot P_A$$

a = 1.3 - 1.6 for 85% capture of annual runoff

P_A = 0.6 inches along the cost
= 0.4 inches inland

$P_{o\ (coast)}$ = 0.12 - 0.14 inches (residential, C=0.15)
= 0.70 - 0.86 inches (commercial, C=0.9)

$P_{o\ (inland)}$ = 0.08 - 0.10 inches (residential, C=0.15)
= 0.50 - 0.58 inches (commercial, C=0.9)

Option 3:

Capture of Arbitrarily Selected Event

- Select return period and duration (e.g., 1-year, 12-hour event)
  - Determine volume based on runoff coefficient and watershed characteristics (Rational Method)

OR

- Select a depth of precipitation (e.g., first one-half inch of rainfall)
  - Determine volume based on runoff coefficient and watershed characteristics (Rational Method)

Comparison of Volume Requirements

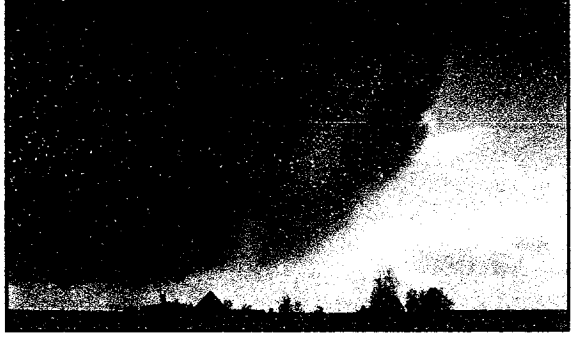
- Extended Detention Basin Volume needed for 247 acre mixed commercial and residential uses, 50 percent impervious, 40-hour release

Annual Capture 11.1 ac-ft	85 percent capture
Maximized Volume 12.6 ac-ft	~87 percent capture ~14 percent larger
Arbitrary Event (1-yr, 24-hr) 26.7 ac-ft	~97 percent capture ~240 percent larger

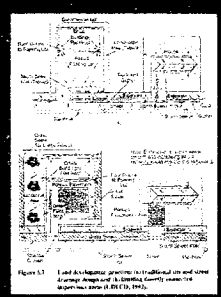
Summary

- Design for the small storm
- Minimize Directly Connected Impervious Area
- Use the treatment train concept
- Design outlet controls as multi-stage to reproduce natural flow frequency curve

Design of Best Management Practices



Minimize DCIA



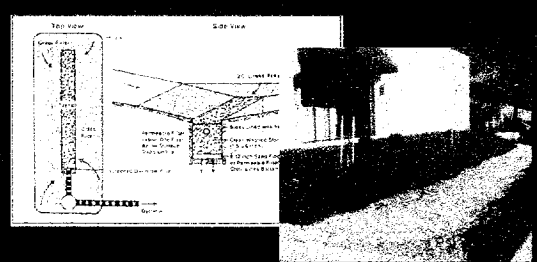
- Drain Hard Lot Surfaces onto Pervious Areas
- Use Modular Pavement where Feasible
- Drains Streets to Swales

Lot/Site Drainage



Lot/Site Drainage

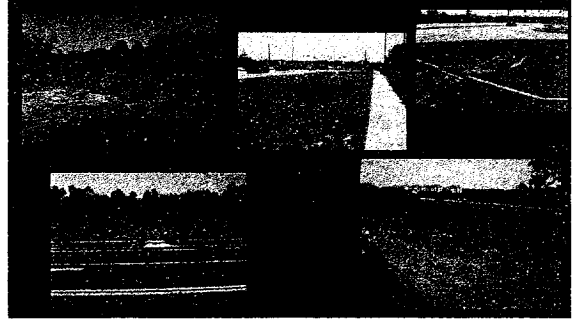
Percolation Trench



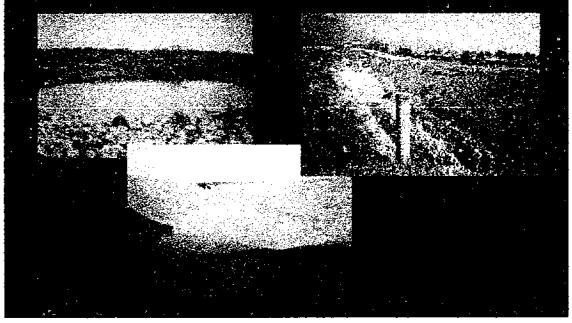
Use Swales for Road and Parking Lot Drainage



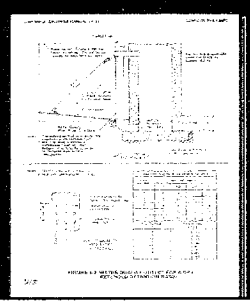
Infiltration Basins



Extended Detention



Extended Detention (cont)



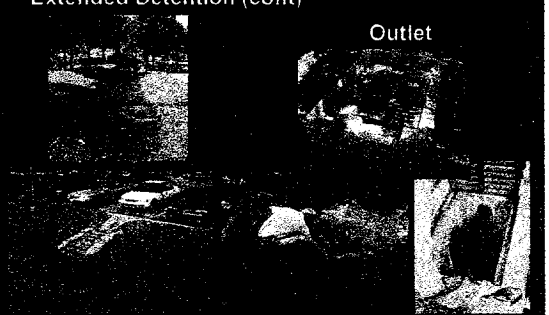


Extended Detention (cont)



Extended Detention (cont)

Outlet



Inlet

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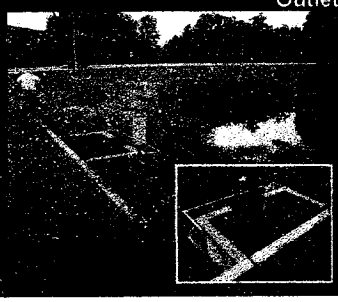
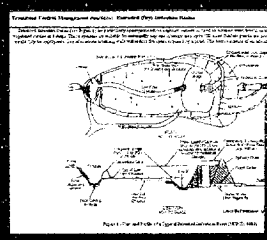
Extended Detention

Outlets (cont)



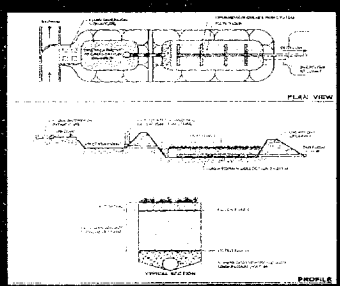


Extended Detention





Detention w/ Filtration

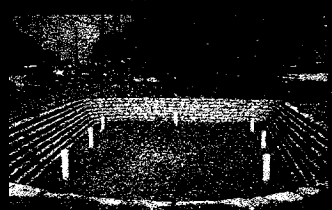


Detention w/ Filtration
Classic Application



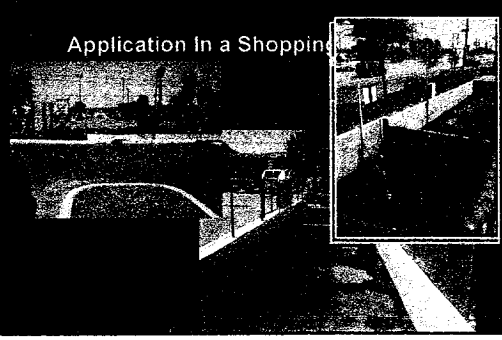
Detention w/ Filtration

Applications



Detention w/ Filtration

Application In a Shoppin



Detention w/ Filtration

Application to a Business Site



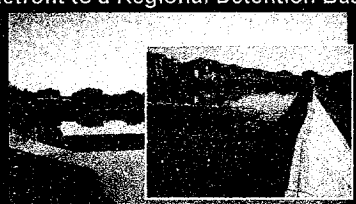
Detention w/ Filtration

Retrofit to a Regional Detention Basin

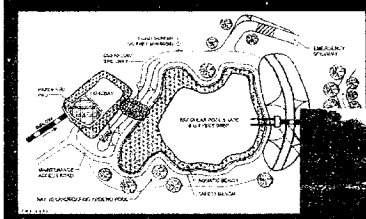


Detention w/ Filtration

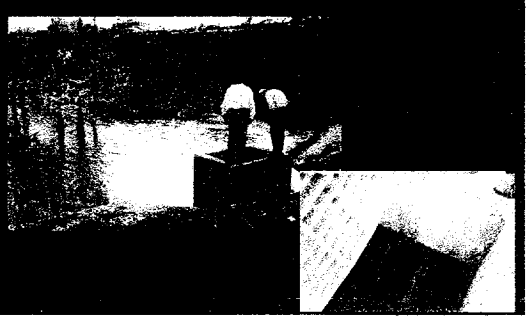
Retrofit to a Regional Detention Basin



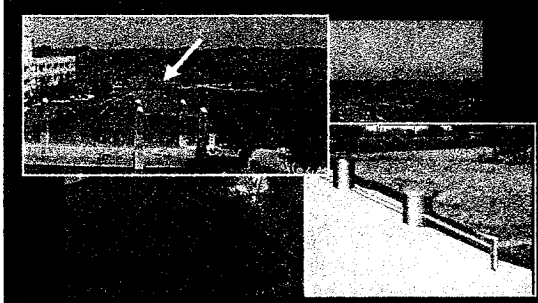
Retention



Retention



Retention w/ Added Detention



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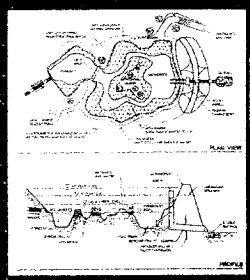
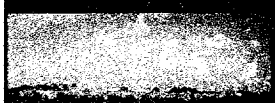
Constructed Wetland





Wetlands



two years ago

today, a year after cleaning



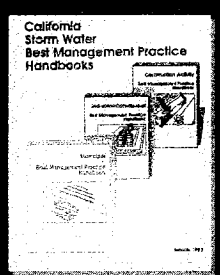
Summary

- Design for the small storm
- Minimize Directly Connected Impervious Area
- Use the treatment train concept
- Design outlet controls as multi-stage to reproduce natural flow frequency curve

Recommended Reading



California BMP Handbooks



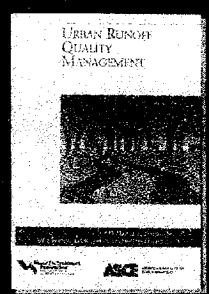
1993

The Joint ASCE/WEF Manual of Practice

Pragmatic

Broadly Based

1998



WEF MOP No. 23

ASCE Manual and Report on Engineering No. 87

Also available through APWA

The ASCE/WEF MOP

- Defines the state-of-practice
- Diversity of disciplines vocations and geography represented
- Introduces ecology into the equation

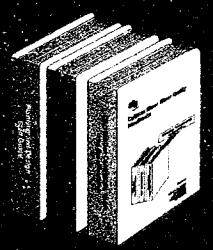


MOP Table of Contents

- Introduction to Urban Runoff
- Developing Municipal Stormwater Management Programs
- Monitoring Modeling and Performance Auditing
- Source Controls
- Selection and Design of Passive Treatment Controls

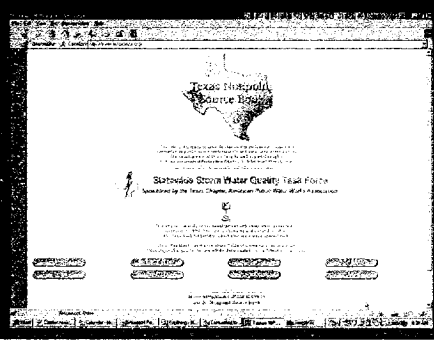


Targeting Highway Runoff



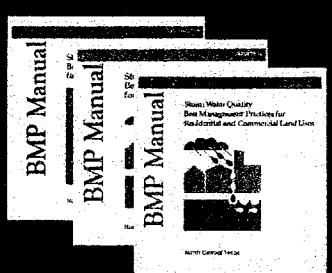
1997

Oh No! Its Texas Again!



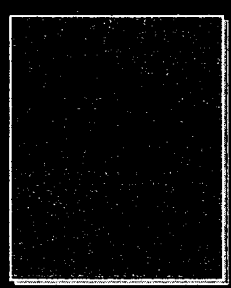
1999

Not to be Outdone!



1994

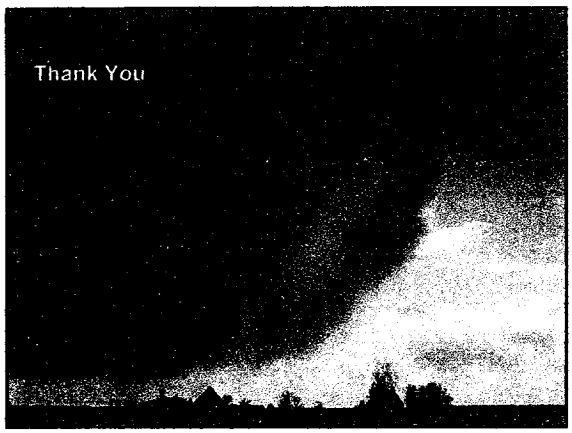
Update and Complete Volume 3 - BMP Manual



The Denver Urban Drainage and Flood Control District
BMP Manual

1998

R0070186


Thank You

STANDARD URBAN STORMWATER MITIGATION PLANS (SUSMPs)

REGIONAL WATER QUALITY CONTROL BOARD MEETING SEPTEMBER 16, 1999

- Many new development projects for restaurants, service stations, major industrial facilities, 10+ home subdivisions, etc. will now be required to prepare SUSMPs for the City's review and approval as part of the permit approval process.
- The Board is likely to impose requirements for developers to design and install treatment systems with the capability to capture and treat the first flush (0.6 to 0.75 inches) of rainfall as part of the SUSMP process.
- The cities have been working for over two years on standardized SUSMPs that do not require numerical limits on capture and treatment. The implementation of numerical limits at this point may void the work already completed on the SUSMPs.
- Standard numerical limits reduce the flexibility of the project design, and may not be appropriate for all areas.
- Treatment methods can range from retention and infiltration basins to storm water clarifiers and vegetative swales.
- For a one-acre property, approximate costs for treatment systems can range from approximately $5,000 (for catch basin filter inserts) to $25,000 or more (for designed infiltration systems).
- The effectiveness of treatment systems to mitigate pollutant discharges has not been adequately demonstrated.
- The question of who will ultimately be responsible for ongoing maintenance of treatment systems has yet to be resolved.

The SUSMP guidelines are not finalized yet, but may be as early as the regional Board's hearing on September 16, 1999.

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Fax # 562 984 7391	Fax #	

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Co. | Co. Please share w/ Xavier Swamikanna.
Phone # | Fax #

MEMORANDUM (Draft 12/6/99 adds #s 4 and 5)

To: Dennis Dickerson, Executive Officer

From: Jorge Leon, Senior Staff Counsel

RE: Standard Urban Storm Water Mitigation Plans pursuant to Order No. 96-054.

This memo provides an analysis of the legal issues that have been raised regarding the proposed Standard Urban Storm Water Mitigation Plans (SUSMPS) pursuant to Order No. 96-54.

1. Regional Board authority to adopt the proposed SUSMP.

Regional Board Order No. 96-054 (" Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges Within the County of Los Angeles") requires that each of the Permittees develop an Urban Storm Water Mitigation Plan following the model approved by the Executive Officer. (Part III.A., at Page 31.) The proposed action would adopt the model, or Standard Storm Water Mitigation Plan for the Permittees to follow.

Although Order No. 96-054 provides that the Executive Officer has authority to approve the model program, as proposed, the current proposal is to ask the Board itself to consider adopting the SUSMPS at an upcoming meeting.

The proposed SUSMPS would require, *inter alia*, (a) that the permittees provide for runoff retention and (b) that they comply with specified numerical limits. These requirements are based upon the staff's application of

provisions of the Clean Water Act, Section 402(p) and the 1987 Amendments to the CWA. The federal provisions require that a storm water program:

" * * *

(ii) Shall include a requirement to effectively prohibit non-storm water discharges into storm sewers; and

(iii) shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [Section 402(p)(3)(B), USC Section 1342(p)(3)(B), emphasis added.]

The proposal is an effort to meet these requirements. In a 1992 decision, the U.S. Court of Appeals for the Ninth Circuit (NRDC v. US EPA, 966 F.2d 1292) interpreted the above language as providing the Administrator or the State with a substantial amount of discretion:

" [t]he language in (iii), above, requires the Administrator or the State to design controls. Congress did not mandate a minimum standards approach or specify that EPA develop minimal performance requirements"we must defer to EPA on matters such as this, where EPA has supplied a reasoned explanation of its choices."

The decision sometimes referred to as " NRDC II" stands for the proposition that the EPA and the States are authorized to require implementation of storm water activities that, upon " reasoned explanation," accomplish the goals of Section 402(p).

In a very recent decision, the Ninth circuit Court of Appeals reinforced the EPA's and the State's authority in this area. In Defenders of Wildlife v. Browner (1999) Case No. 98-71080, the Ninth Circuit Court of Appeals reviewed an action of the US EPA to adopt a Storm Water Management Program in the State of Arizona. That program included best management practices such as storm water detention basins, retention basins, and infiltration ponds. The question was whether the EPA may require numeric limitations to ensure strict compliance with the state water-quality standards. The Court concluded that the CWA does not require strict compliance, however, citing the language of (iii), it stated: " [t]hat provision gives the EPA discretion to determine what pollution controls are appropriate. As this court stated in NRDC II, 'Congress gave the administrator discretion to determine what controls are necessary"[cites omitted] (at page 11687).

The SUSMPS proposal is an effort to meet the CWA Section 402(p) requirements and the staff has provided a " reasoned explanation of its choices." Accordingly, the proposed SUSMPS requirements are well within the Regional Board's authority and discretion.

2. Compliance with the California Environmental Quality Act.

The City of Los Angeles has requested the ■ Regional Board's analysis of the potential multi-media environmental impacts from the proposed requirement ■ (i.e. the California Environmental Quality Act documentation and supporting information developed for this specific discretionary regulatory action.■ The proposed action is a requirement of Order No. 96-054. The issuance of the order itself, and the requirements contained in the order, are exempt from CEQA (Water Code Section 13389). Accordingly, no specific CEQA documentation has been prepared for this proposal. Nonetheless, the staff has prepared preliminary cost-benefit analyses and these can be provided.

3. A party commented that insufficient notice has been provided to the public regarding this matter.

As noted above, this proposal is in compliance with the requirements of Order No. 96-054. The Storm Water Permit contemplates that the Executive Officer would approve the SUSMPS. The original SUSMPS proposal was issued to the public on xxxx, 1999. While the only applicable legal notice requirement is 10 days (Govt. Code Section 11125), the Regional Board staff has provided 30 days public notice of the modified version.

4. Implementation Date.

Order No. 96-054 contemplates that implementation of the SUSMPS requirements commence no later that July 30, 1999.

Since that date has passed, a new implementation date must be determined following approval of the SUSMPs by the Regional Board. There is no legal standard upon which to base a new implementation date. However, the schedule set forth in Order No. 96-054 may serve as a useful alternative date. Part 2, III.A.2 sets forth an implementation schedule of ≤ not less than 90 days prior to the commencement of the Permittee's fiscal year.≥ My recommendation is to request that the parties submit comments on this issue and that the Board consider alternatives proposed, including the above, in setting a new implementation date.

5. Permittee SUSMP Implementation.

Order No. 96-054 requires that the Permittees implement the SUSMP proposal as part of their planning activity approval process. In order to implement the requirements required by the SUSMPS, the Permittees may be required to adopt or amend their ordinances or other regulations concerning their local planning process.

Please let me know if there are additional comments that need to be addressed.

SCSMP Adm Rec.

Ventura Countywide Stormwater Quality Management Program

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

Ventura County Flood Control District

Fax

To:	Xavier Swamikannu	**From:**	Vicki Musgrove
Fax:	(213) 576-6660	**Date:**	1-19-00
Phone:	(213) 576-6654	**Pages:**	3
Re:	Equivalent Percent Volume Capture	**CC:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

Comments: Attached is my rough mark-up of the referenced document. Call me if you have any questions or comments. Thanks! Vicki

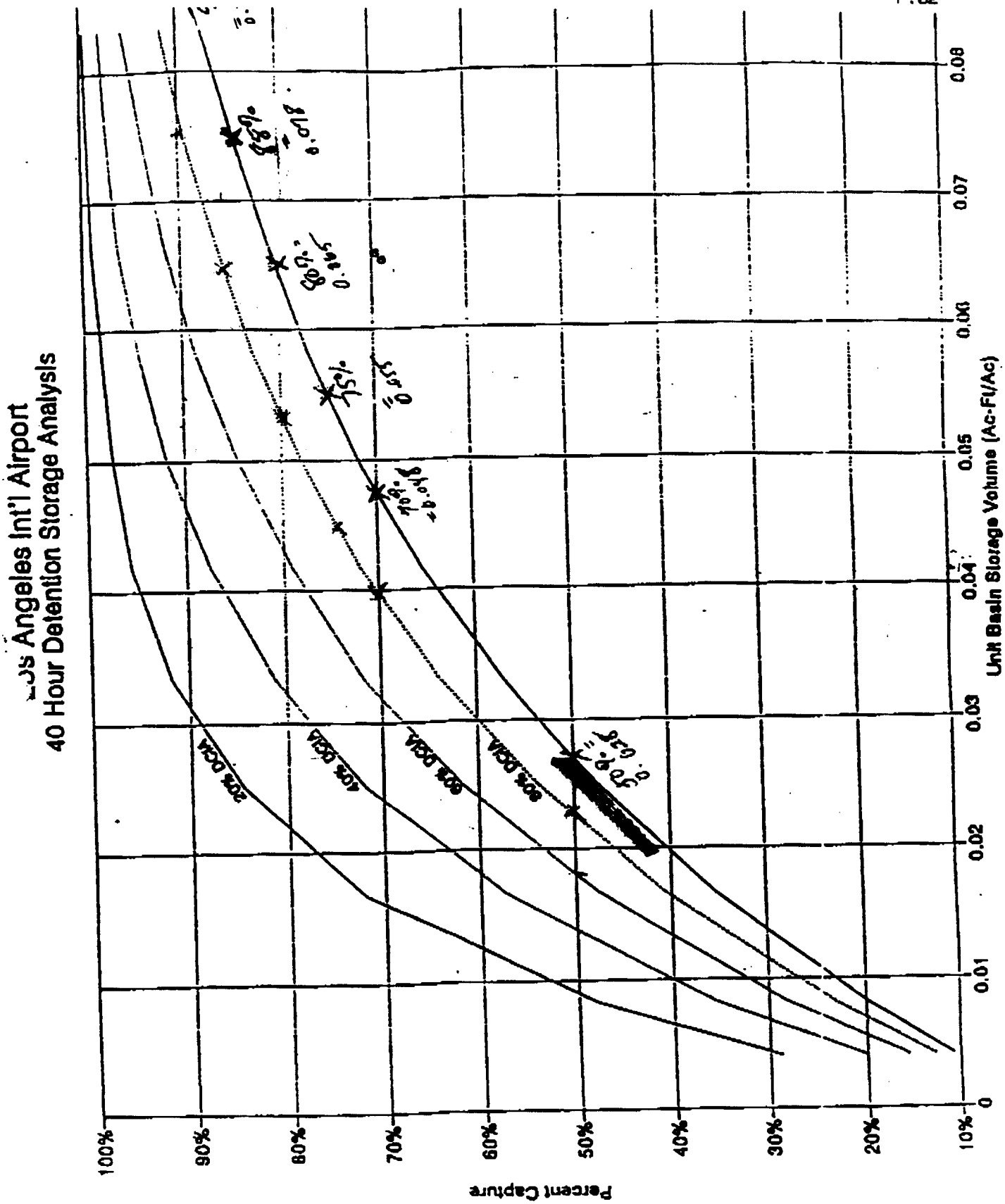
Marked Curves attached !

R0070194

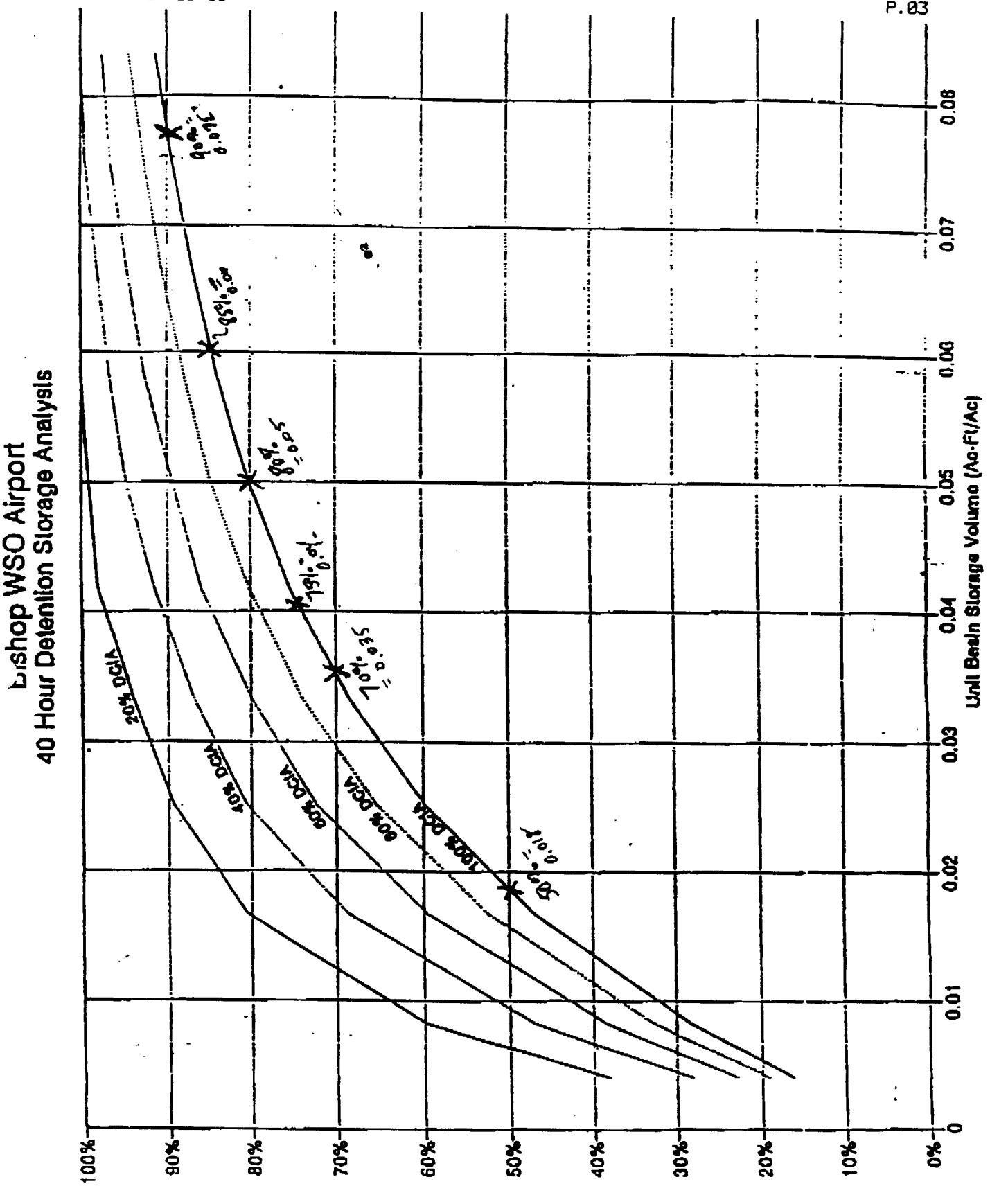
From the Desk of...

Vicki Musgrove
Ventura County Flood Control Department
800 South Victoria Avenue
Ventura, CA 93009
Phone: 805-654-5051
Fax: 805- 654-3360

FAXED


Los Angeles Int'l Airport
40 Hour Detention Storage Analysis
Unit Basin Storage Volume (Ac-Ft/Ac)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
Percent Capture
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
85% DCIA
80% DCIA
70% DCIA
60% DCIA
50% DCIA

R0070195


Bishop WSO Airport
40 Hour Detention Storage Analysis
Unit Basin Storage Volume (Ac-Ft/Ac)
Annual Percent Capture
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA
0
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40%
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20%
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0%

R0070196



Ventura Countywide Stormwater Quality Management Program



Ventura County Flood Control District

Fax

To:	Xavier Swamikannu	**From:**	Vicki Musgrove
Fax:	(213) 576-6660	**Date:**	1-19-00
Phone:	(213) 576-6654	**Pages:**	3
Re:	Equivalent Percent Volume Capture	**CC:**	

☐ **Urgent** ☐ **For Review** ☐ **Please Comment** ☐ **Please Reply** ☐ **Please Recycle**

•Comments: Attached is my rough mark-up of the referenced document. Call me if you have any questions or comments. Thanks! Vicki

R0070197

From the Desk of...

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STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

CALCULATIONS TO DETERMINE EQUIVALENT PERCENT VOLUME CAPTURE CRITERION

Unit Basin Storage Volume Figures Used appear to be from Table D-5 Bishop USO Airport

The calculation to determine the equivalent criterion using the percent volume capture method indicates that 85 percent volume capture is closest to the maximized water quality treatment volume method and the 85th percentile rainfall event treatment volume for Los Angeles County (0.75 inch). The unit basin storage volumes were determined from the California Stormwater BMP Handbook- Industrial/ Commercial, Pg. D7.

	Using LA ~~D-7~~	Using Ventura ~~#8201~~
(a) For 90 percent annual runoff volume capture for 40 hours		
⇨ Unit basin storage volume = 0.075 ac-ft/ac		
⇨ Required storage volume = Unit basin storage x Area of site	0.09 ac-ft/ac	0.1
= 0.075 ac-ft/ac x 5.51 ac		
= 0.4133 ac-ft		
= 18,003 ft³ = 134,665 gal.	161,579	179,532
(b) For 85 percent annual runoff volume capture for 40 hours		
⇨ Unit basin storage volume = 0.06 ac-ft/ac	0.078	0.085
⇨ Required storage volume = Unit basin storage x Area of site		
= 0.06 ac-ft/ac x 5.51 ac		
= 0.3306 ac-ft		
= 14,401 ft³ = 107,719 gal.		152,602
(c) For 80 percent annual runoff volume capture for 40 hours		
⇨ Unit basin storage volume = 0.05 ac-ft/ac	0.065	0.075
⇨ Required storage volume = Unit basin storage x Area of site		
= 0.05 ac-ft/ac x 5.51 ac		
= 0.2755 ac-ft		
= 12,001 ft³ = 89,765 gal.	116,484 gal	134,649
(d) For 75 percent annual runoff volume capture for 40 hours		
⇨ Unit basin storage volume = 0.04 ac-ft/ac		
⇨ Required storage volume = Unit basin storage x Area of site	0.055	.065
= 0.04 ac-ft/ac x 5.51 ac		
= 0.2204 ac-ft		
= 9,601 ft³ = 71,813 gal.	98,563 gal	116,696

R0070198

? Some question of methodology used but ok.

Using LA 80%

Using VC 75%

- **Step 4 - Select BMPs**

The most cost-effective BMP scenario is selected using Worksheet 2 in Chapter 3. The first step in setting up Worksheet 2 is to determine the average annual pollutant loading from the site prior to development (i.e, pasture with no BMPs), the annual pollutant load increase due to the development, and the average annual pollutant loading under each of the three BMP scenarios identified in Step 3. The purpose is to compare projected non-point source pollutant loads before and after development in order to identify the load reductions that could be achieved by placing different BMP options. The NURP data and/or other local studies could be used for pollutant load estimates, runoff estimates, or removal efficiencies.

For this example, pollutant loads were simulated using the Camp Dresser & McKee Inc. (CDM) Watershed Management Model (WMM). WMM is a spreadsheet-based tool for annual and/or seasonal load evaluations based on the methodology outlined in the Guidance Manual for the Preparation of Part 1 of the NPDES Permit Application for Discharges from Municipal Separate Storm Sewer Systems, EPA, 1991. EMCs and impervious values for WMM are shown in Table 2. These are based upon NURP data and CDM experience. For WMM, annual runoff volumes for the pervious/impervious areas in each land use category are calculated by multiplying the average annual rainfall volume by a runoff coefficient. A runoff coefficient of 0.9 is typically used for impervious areas (i.e., 90 percent of the rainfall is assumed to be converted to runoff from the impervious fraction of each land use). A pervious area runoff coefficient of 0.15 is typically used. The total average annual surface runoff from a given land use L is calculated by weighting the impervious and pervious area runoff factors for each land use category as follows:

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To Xavier S. | From Shobha I
Co./Dept. LARWQCB | Co. City L.A. Stormwater
Phone # 213-576-6654 | Phone # 213-847-5226
Fax # 213-576-6640 | Fax # 213-847-5443

$$R_L = [\ C_p + (C_I - C_p)\ IMP_L\ ] * I \qquad \textit{Equation 1}$$

Where: R_L = total average annual surface runoff from land use L (in/yr)
IMP_L = fractional imperviousness of land use L from Table 2
I = long-term average annual precipitation (in/yr)
C_p = pervious area runoff coefficient = 0.15
C_I = impervious area runoff coefficient = 0.90

WMM generates nonpoint source pollution loads (expressed as lbs/yr) that vary by land the percent imperviousness associated with each land use. The pollution loading M_L is computed for land use L by the following equation:

$$M_L = EMC_L * R_L * K * A_L \qquad \textit{Equation 2}$$

Where: M_L = loading factor for land use L (lb/yr)
EMC_L = event mean concentration of runoff from land use L (mg/L); EMC_L varies by land use and by pollutant
R_L = total average annual surface runoff from land use L computed from Equation 1 (in/yr)
K = 0.2266, a unit conversion constant
A_L = area of land use L (acres).

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The loads are then summed for a given area or scenario to produce summary results without BMPs. BMP efficiencies are then applied as fractional removal coefficients to reduce annual loads.

LA CITY SAN STORMWATER Fax:213-847-5443 Mar 6 2000 13:50 P.02

Table 2

Event Mean Concentrations And Impervious Percentages Assigned For The Watershed Management Model

Land Use	Percent Impervious	Oxygen Demand & Sediment				Nutrients				Heavy Metals			
		BOD mg/L	COD mg/L	TSS mg/L	TDS mg/L	TP mg/L	SP mg/L	TKN mg/L	NO23 mg/L	Pb mg/L	Cu mg/L	Zn mg/L	Cd mg/L
Forest/Open	0.5%	8.0	51	216	100	0.23	0.06	1.36	0.73	0.00	0.00	0.00	0.00
Agriculture/Pasture	0.5%	8.0	51	216	100	0.23	0.06	1.36	0.73	0.00	0.00	0.00	0.00
Cropland	0.5%	8.0	51	216	100	0.23	0.06	1.36	0.73	0.00	0.00	0.00	0.00
Low Density Residential	10.0%	10.8	83	140	100	0.47	0.16	2.35	0.96	0.18	0.05	0.18	0.002
Medium Density Residential	30.0%	10.8	83	140	100	0.47	0.16	2.35	0.96	0.18	0.05	0.18	0.002
High Density Residential	50.0%	10.8	83	140	100	0.47	0.16	2.35	0.96	0.18	0.05	0.18	0.002
Commercial	90.0%	9.7	61	91	100	0.24	0.10	1.28	0.63	0.13	0.04	0.33	0.002
Office/Light Industrial	70.0%	9.7	61	91	100	0.24	0.10	1.28	0.63	0.13	0.04	0.33	0.002
Heavy Industrial	80.0%	9.7	61	91	100	0.24	0.10	1.28	0.63	0.13	0.04	0.33	0.002
Water	100.0%	3.0	22	26	100	0.03	0.01	0.60	0.60	0.00	0.00	0.11	0.000
Wetlands	0.5%	8.0	51	216	100	0.23	0.06	1.36	0.73	0.00	0.00	0.00	0.00
Major Highway	90.0%	9.7	103	142	100	0.44	0.17	1.78	0.83	0.53	0.05	0.37	0.002

Source: EPA, 1983 and CDM experience

Ventura Countywide Stormwater Quality Management Program

Ventura County Flood Control District

Fax

To: Xavier Swamikannu From: Vicki Musgrove

Fax: (213)576-6660 Date: 11/17/99

Phone: Pages: 7

Re: CC:

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•Comments:

As you requested!

R0070201

From the Desk of...

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Fax: 805-654-3350

Ventura Countywide Stormwater Quality Management Program

Participating Agencies

Camarillo

County of Ventura

Fillmore

Moorpark

Ojai

Oxnard

Port Hueneme

San Buenaventura

Santa Paula

Simi Valley

Thousand Oaks

Ventura County Flood Control District

September 13, 1999

Mr. Xavier Swamikannu
California Regional Water Quality Control Board, Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Subject: **Regional Board Staff Recommendation - Notice of Public Hearing – Consideration of Standard Urban Storm Water Mitigation Plans Submitted for Approval to the Executive Officer Under the Los Angeles County Municipal Storm Water Permit**

Dear Mr. Swamikannu:

Attached is a document that describes the methodology used to develop the approach for design of both volumetric and flow-based treatment control Best Management Practices (BMPs) presented in the Ventura Countywide Stormwater Management Program's Draft Guidelines for Land Development.

This methodology has been successfully utilized in the design of BMPs on new development projects throughout Ventura County. A great deal of time and energy was put into development of these standards and it has been determined that they are comparable to those listed in the subject document.

We therefore ask that you appropriately include the following additional third option for derivation of numerical mitigation measures.
3. unit basin storage volume design based on 70% capture of annual runoff and flow based design criteria based on 10% of the peak 50-year flow rate from impervious areas calculated using standard flood control hydrology.

If you have any questions or need additional information, please call me at (805) 654-2040 or Vicki Musgrove at (805) 654-5051

Very truly yours,

Alex Sheydayi, Chair
Management Committee
Ventura Countywide Stormwater Quality Management Program

L #1600, 800 South Victoria Avenue, Ventura, CA 93009
(805) 654-2002 FAX (805) 654-2424

R0070202

Stormwater Treatment A Design Approach for Volumetric and Flow Based Best Management Practices

Prepared by
Camp Dresser & McKee Inc.
Jeffrey D. Endicott, P.E.
Donald J. Schroeder, P.E.
Larry A. Roesner, Ph.D., P.E.

General Theory for Volumetric Controls

Many of the pollutants carried by storm water as it flows through and out of a drainage area are associated with solid particles that are held in suspension by the turbulent motion of the water. By creating a volume of slowly moving or quiescent water, those sediments have a chance to fall out of suspension. Generally, the larger the particle, and the greater its specific gravity, the quicker it falls out of suspension. As a result of this phenomenon, simple settling in volumetric controls such as detention basins can be an effective treatment mechanism for stormwater runoff. However, for very fine particles, other factors may come into play, and even in motionless water, particles may remain suspended indefinitely. Therefore, there is a physical limit to the pollutants that can be removed by settling. Unless chemical reactions or other factors intervene, some pollutants may stay in the water no matter how long it is detained.

A second factor also affects sediment removal by settling, and is related to the sequence in which storms enter the basin. If a basin has a chance to empty completely from one storm event before the next arrives, the next event can take full advantage of the available storm volume. However, if the previous event is still partially held by the basin, the two events interfere. There are three major factors contributing to this interference. First, the effective volume of the basin available to capture water from the second event is reduced by the residual volume from the first event. Hence, an overflow (basin capacity exceeded) is more likely for the second event. Second, even if the basin does not overflow, the volume retained by the basin after the second event is larger than it would be if the residual from the first event was not present, so recovery from the second event takes longer. And, third, the constituents carried by the second event mix with those from the first event, and the result is that the detention from the second event now attempts to remove a mix of settleable material that is inherently less prone to settling.

Over all, interference between events generally reduces the effectiveness of the basin. And, the longer flows are held, the more likely it is that interference will occur. It is therefore important to attempt to size basins so that water is held long enough for adequate settling to occur, but not so long that inter event effects (interference) become large. Many factors come into play in this situation, and design variables such as compartmentalization and baffling can affect basin performance quite substantially. However, the basic principle is that a balance of factors determines removal effectiveness.

Research carried out over the last ten years or so has provided insights that make possible a number of general conclusions regarding basin sizing, and determination of maximum effectiveness. Most prominent in the literature in this area is the data and related assessments of the National Urban Runoff Program.

This program evaluated a large number of urban cases, and it was found that a clear pattern emerged in relation to settleable materials. In essence, it became clear that a range of settleability was encountered in urban runoff. At one end of the scale is a size range that relates to sands or other relatively coarse materials, which settle out of solution in a matter of minutes or hours. At the other end of the scale are clays and fine particles that take days for removal. This latter group cannot effectively be removed by settling, since water held over a period of days almost inevitably results in inter event mixing, and removal does not occur. In fact, inter event effects commonly become quite significant if basin retention is longer than 2 to 3 days, since rainfall frequency is typically of this order during stormy periods. However, holding water for less than 1 day is problematic from the standpoint of water quality improvement since for typical sizes and depths available for basins, durations of less than approximately 2 days neglect the opportunity to remove significant fractions of sediments that are quite amenable to settling.

Experience shows that calculated detention times in the range of 24 to 48 hours are likely to provide the best compromise between factors, and result in the best performance of basins that rely on unassisted (no chemical additives) settling as the primary water quality improvement mechanism. A detention time of in this range is a good choice for providing significant removal, by allowing reasonable opportunity for settling of materials that can be removed that way, without promoting the problems inherent in attempting to achieve significantly longer detention times. It must be noted that the concept of detention time is only meaningful at one particular storm event and runoff volume, while in actuality, runoff volume and patterns vary widely over all storms. For typical basins with gravity flow discharge, the average detention time is a function of basin surface area and depth, and configuration of the discharge pipe or spillway. Therefore, basin design parameters must include total basin volume and drawndown time at a full basin. By using a 40-hour drawdown time when the basin is full, the average detention time over all storms is likely to be closer to 24 hours. The California BMP Handbook (Municipal) describes a rational approach for basin sizing and drawdown.

Origin of California BMP Handbook (Municipal) Criteria for Volumetric Controls

The California BMP Handbook (Municipal) criteria were developed as follows. Based on a review of the general climatology of the state with respect to mean annual rainfall and topography, fifteen rain gages with long term hourly rainfall records were selected by the project team hydrologists as being representative of various regions in the state. A comparative analysis of the rainfall data at these stations revealed that of the 15 stations analyzed, the rainfall statistics of six of the stations were similar to another station in the set of 15, so those areas were grouped into the same climatic zone, resulting in nine general hydrologic/topographic zones for the state. These are shown and described in Appendix D of the California BMP Handbook (Municipal), and are attached for reference. For each of the nine rain gages, long term simulations of runoff were examined using the U.S. Army Corps of Engineers' Storage, Treatment Overflow Runoff Model (STORM). STORM is a hydrologic model that translates a time series of hourly rainfall data into a time series of runoff, then routes the runoff through detention storage. The model results were then plotted as annual percent runoff capture versus unit basin storage volume. These are shown in Appendix D of the California BMP Handbook (Municipal), and are attached for reference. The assumptions used in the STORM modeling for this effort include a 40-hour drawdown time, initial abstraction/depression storage of 0.06 inches, and a runoff coefficient of 0.9 for impervious surfaces and 0.15 for pervious surfaces.

It is worthwhile to note that at the time the California BMP Handbook (Municipal) was prepared, a series of STORM runs were also made for the same conditions and stations noted above, but using a 24 hour rather than a 40 hour drawdown. The resultant reduction in required basin volume ranged from only 10 to 20 percent.

Using the California BMP Handbook (Municipal) approach to determine required basin size for a particular application, one enters an Appendix D curve for the hydrologic zone that the project lies within with the percent imperviousness of the area that drains to the basin and the required percent capture of the annual runoff. The required percent capture of the annual runoff is usually set at the "knee of the curve." The knee of the curve represents the point beyond which the incremental capture of runoff diminishes relative to the incremental increase in required basin volume and, therefore, basin cost. In other words, the incremental cost increase in the basin would begin to greatly outweigh the incremental increase in pollution control benefits.

It is important to note that ultimate pollutant removal effectiveness is not highly sensitive to selection of the percent annual capture. For example, a study in Denver showed that when the annual runoff volume captured increased from 75%, to 85%, and to 94%, the average annual total suspended sediments removed increased from 86%, to 88%, and to 90% respectively, a mere 4% gain in pollutant removal for a 20% increase in annual runoff volume captured (Urbonas *et al.*, 1990). This suggests that the "knee of the curve" is a good starting point for discussion of a volumetric design standard, but that politically, socially, and environmentally responsible standards 5 to 10 percent below the "knee of the curve" may emerge during a thorough maximum extent practicable (MEP) analysis conducted at the community level. Furthermore, refinement of the California BMP Handbooks (Municipal) approach can be accomplished at the community level by redoing the analysis using local rainfall statistics and hydrologic parameters established by responsible local authorities such as flood control agencies; however, this is not expected to yield significant differences from the results set forth in the California BMP Handbooks (Municipal).

General Theory for Flow-Based Controls

Flow-based controls are another option for removing many of the same pollutants removed through the volumetric controls discussed above. Flow-based controls include biofilters such as vegetated swales and filter strips, as well as media filters. These controls remove pollutants through filtering primarily, but also through some limited settling. Because the removal mechanism, filtering, is fundamentally different than settling, a different design approach is needed for these controls.

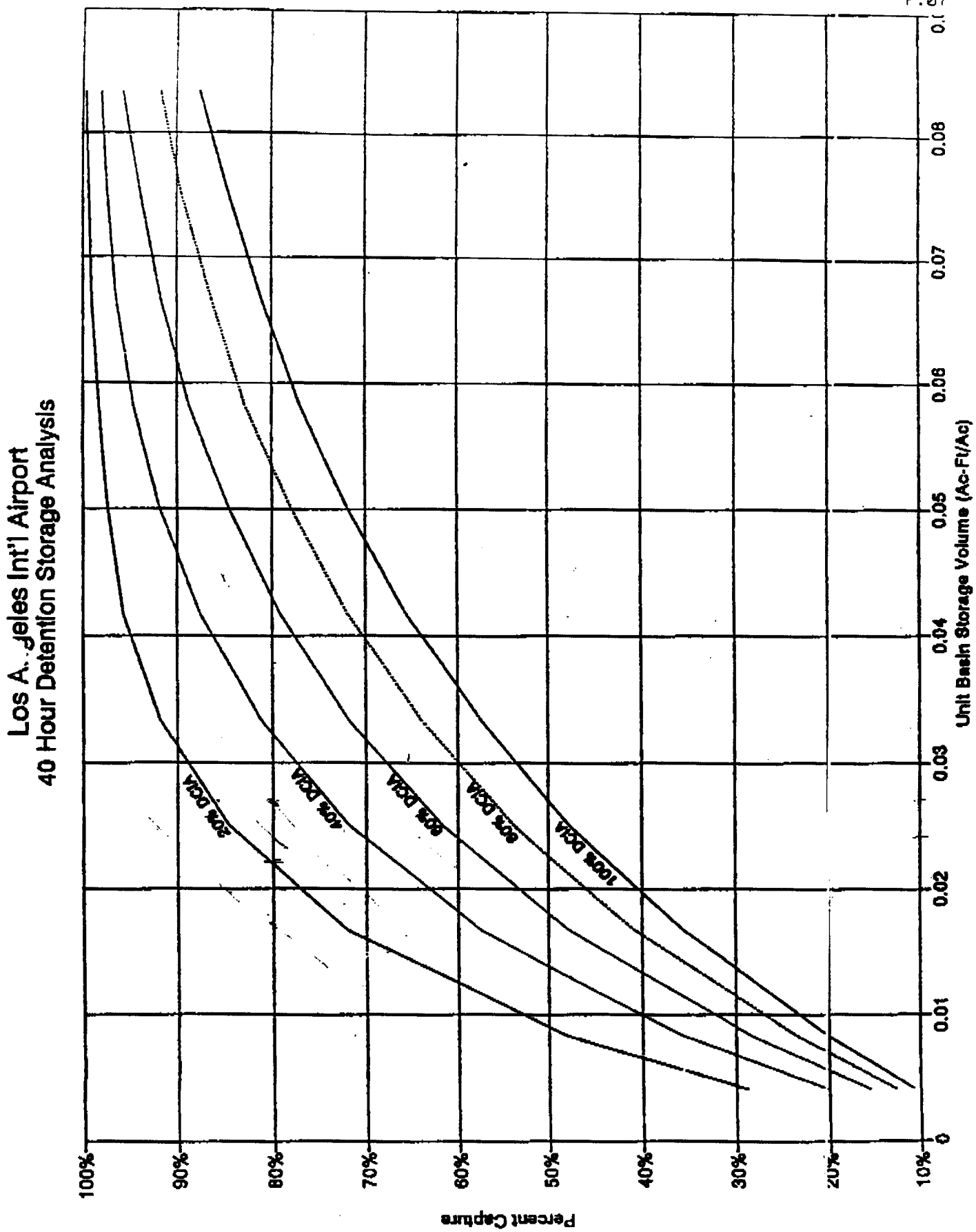
Historical hourly and 15 minute incremental rainfall records can be analyzed and separated into storm events using a model such as the U.S. Department of Transportation, Federal Highway Administration's Synoptic Rainfall Analysis Program (SYNOP). Once separated, the relative frequency of storms of various magnitudes can be plotted. The precipitation plot for LAX is included for reference. A review of the LAX plot (and similar plots throughout the West) shows that the overwhelming majority of all storms are relatively small. For example, the estimated 1 year, 24 hour rainfall event in Los Angeles is estimated at 1.8 inches, which is larger than approximately 95% of all storms in the basin.

The runoff that results from these small storms can calculated using standard hydrologic practices, accumulated, and then plotted versus event size. The accumulated runoff plot for LAX is included for reference. A review of the LAX plot (and similar plots throughout the West) shows that a large number of storms are too small to produce any runoff, that the group of frequent small storms produce a large accumulation of runoff, and that the large "flood event" type storms produce only a fraction of the total runoff. For LAX, this curve shows that the accumulated runoff from all storms up to the previously noted 1.8 inch rainfall (1-year,-24 hour event) produces approximately 90% of all runoff produced by the drainage area.

Suggested Flow-Based BMP Design Criteria

The rainfall-runoff phenomenon described above suggests that flow-based controls designed to treat the flow from small storms will result in treatment of a substantial majority of all runoff from a particular drainage area. Because drainage area characteristics and the intensity and duration of rainfall have substantial impact on the rate of runoff from a given storm, a design criteria for flow-based controls must be expressed in terms of an associated return period and event duration. It is suggested that event duration be that which will result in the peak rate of runoff from a storm of given intensity, and is equal to the time of concentration of the subject drainage area. It is suggested that the event return period be set such that the runoff treated will be similar to or greater than the unit basin volume for 100% impervious area at the target percent capture rate, which will typically be on the order of a 6 month or 1 year storm.

Unfortunately, rainfall intensity and duration information is not widely published for the small, frequent storms of importance to stormwater quality design. A practical alternative approach would be to use 10% (for impervious areas) of the peak 50 year flow calculated using standard flood control hydrology. This suggested design standard and multiplier can be refined through a thorough input from local flood control and hydrology authorities and a maximum extent practicable (MEP) analysis conducted at the community level.


Los A..geles Int'l Airport
40 Hour Detention Storage Analysis
Unit Basin Storage Volume (Ac-Ft/Ac)
Percent Capture
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0
0.01
0.02
0.03
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VICD %10

R0070207

Ventura Countywide Stormwater Quality Management Program

Ventura County Flood Control District

Fax

To: Xavier Swamikannu From: Vicki Musgrove

Fax: (213)576-6660 Date: 11/17/99

Phone: Pages: 7

Re: CC:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

•Comments:

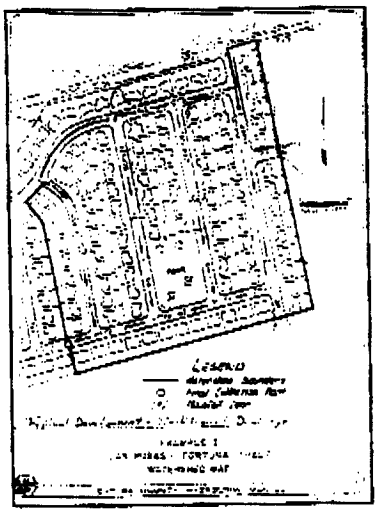
Do you requested!

From the Desk of...

Vicki Musgrove
Ventura County Flood Control Department
800 South Victoria Avenue
Ventura, CA 93009
Phone: 805-654-5061
Fax: 805- 654-3350

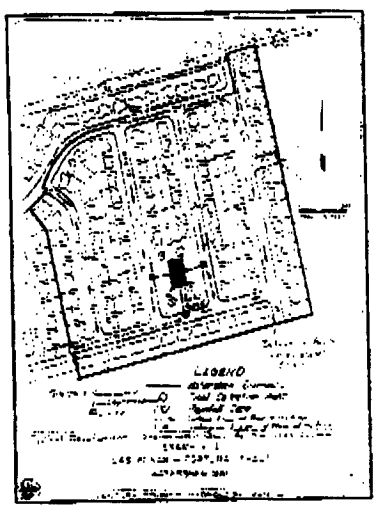
R0070208

Traditional Drainage



- Surface drainage to storm drain

Stormwater Quality Drainage



- Surface drainage to detention basin
- Example project
  - Undeveloped area
    - 1.3 ac
    - 0% impervious area
  - Single Family Residence
    - 22.7 ac
    - 23% impervious area
  - Runoff Coefficient
    - impervious = 0.9
    - pervious = 0.15

R0070209

Typical Basin Parameters

- Detention Basin Design
  - 40 hrs drawdown time
  - bottom width - 30 ft minimum
  - L:W ratio 2:1 minimum
  - side slope 3:1 or flatter

Basin Sizing Criteria

- Ventura County Method
- Water Environment Federation Method
- Los Angeles County Method

R0070210

Ventura County Method

- Modeled after CA BMP Handbooks
- Target "70% annual capture"
- Example Project
  - V_b = 20,038 ft^3 = 0.46 ac-ft
  - Basin Dimensions
    - W = 60 ft
    - L = 120 ft
    - D = 4 ft
    - Z = 3

WEF Method

- Modeled after Urban Runoff Quality Management
- Target "85th percentile 24-hr runoff event determined as the maximized capture storm water volume for the area"
- Example Project
  - $V_{b(event)}$ = 15,497 ft^3 = 0.36 ac-ft
  - $V_{b(volume)}$ = 19,468 ft^3 = 0.45 ac-ft
  - Basin Dimensions (W x L x D), z=3
    - event capture ratio (54' x 108' x 4')
    - volume capture ratio (60' x 120' x 4')

R0070211

LA County Method

- Target "historical-record based reference 24-hr rainfall criterion (0.75" for LA County area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24-hr runoff event"
- Example Project
  - V_b = 20,255 ft³ = 0.46 ac-ft
  - Basin Dimensions
    - W = 60 ft
    - L = 120 ft
    - D = 4 ft
    - Z = 3

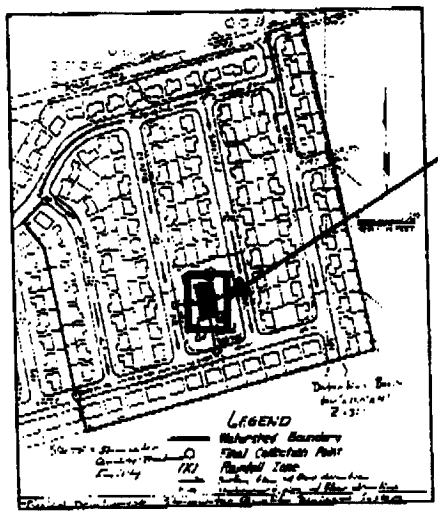
Basin Size Summary

Summary	V_b (ac-ft)	Basin Dimension (WxLxD) z=3	Area Fraction
Ventura County Method	0.46	60' x 120' x 4'	0.69%
WEF Method Event Capture Ratio	0.36	54' x 108' x 4'	0.56%
WEF Method Volume Capture Ratio	0.45	60' x 120' x 4'	0.69%
LA County Method	0.46	60' x 120' x 4'	0.69%

Conclusion - For example project, these methods produce generally similar results

R0070212

Summary



- Stormwater Quality Treatment Facility
  - A small part of the overall project

R0070213

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, CA 90013
Phone (213) 576-6600 FAX (213) 576-6640

Gray Davis
Governor

TO: **Los Angeles County Municipal Storm Water and Urban Runoff NPDES Permittees**
Long Beach Municipal Storm Water and Urban Runoff NPDES Permittees
Interested Parties

FROM: **Dennis A. Dickerson**
Executive Officer

DATE: **December 7, 1999**

SUBJECT: **Proposed Standard Urban Storm Water Mitigation Plan and Supporting Regional Board Resolution**

On September 16th, at the Regional Board meeting, I advised the Regional Board that additional time to develop a revised Standard Urban Storm Water Mitigation Plan proposal would be in the best interest to ensure that the proposal were more fully documented and supported by the record. At that time, I indicated that Regional Board staff would develop a revised proposal at the earliest opportunity but probably not less than 90 days later. This proposal has been developed and is being noticed through this memorandum to Permittees and Interested Parties. The proposal is also being mailed and placed on the Regional Board's Internet website.

The proposed Standard Urban Storm Water Mitigation Plan is designed to ensure that storm water pollution is addressed in one of the most effective ways possible, i.e., by incorporating Best Management Practices (BMPs) in the design phase of new development and redevelopment. The proposal also provides for numerical design standards to ensure that storm water runoff is managed for water quality concerns in addition to flood protection and that pollutants carried by storm water are retained and not delivered to waterways.

The proposed Standard Urban Storm Water Mitigation Plan adds two additional categories for controls, parking lots and environmentally sensitive areas. The proposal also attempts to respond to various concerns by incorporating provisions that allow for flexibility thereby recognizing that a single numerical standard may not be appropriate in every case. Also, the proposed Standard Urban Storm Water Mitigation Plan has taken the original language offered by the Principal Permittee and eliminates much of the duplication allowing for a more concise and understandable document.

A Tentative Resolution is also being offered to the Regional Board for their consideration at the January 6, 2000 Board Meeting. This Tentative resolution acknowledges the structure of both the Los Angeles and Long Beach Municipal Storm Water Permits by allowing the Standard Urban Storm Water Mitigation Plan approval to be accomplished by the Executive Officer for the Los Angeles permit while the Regional Board itself would approve the Standard Urban Storm Water Mitigation Plan pursuant to the City of Long Beach permit. If adopted by the Regional Board, the Tentative resolution would approve the Long Beach Standard Urban Storm Water Mitigation Plan while encouraging the Executive Officer to approve the Los Angeles Standard Urban Storm Water Mitigation Plan. In addition, the Regional Board is being asked to adopt the numerical design standards as the minimum standards for

post-construction BMPs required by the statewide general permit for construction activity for construction projects in the Los Angeles Region.

The September 16, 1999 public hearing was lengthy with many commentors. It is understood that many interested parties will again wish to speak before the Regional Board. In an effort to ensure that the Regional Board is provided with a comprehensive understanding of the concerns associated with this proposal, special arrangements for the presentation of comments are being considered. Specific details on the presentation arrangements for the January 6th Board meeting will be provided in the regular agenda notice. Interested parties are encouraged to contact the Executive Officer to suggest consolidation of comments from many parties into a more comprehensive presentation with an extended time limit.

If you represent a Permittee or other interested party, it would be helpful that by December 20, 1999 you would coordinate with other co-interested individuals and notify this office of (1) lead designated speaker; (2) amount of time needed by the lead speaker; and (3) your request for time for additional speakers and the identity of such additional speakers. The Board will announce the amount of time available for the submission of oral comments in this matter and for discussion among the Board members in the formal notice of the Board's agenda. Upon receipt of the above information, the staff will recommend an allotment of time for all interested parties, based upon the information received. Parties who have not submitted the requested information will be provided any remaining time following allotment.

CC: Regional Board Members

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

Final Tentative
December 7, 1999.

R0070216

LOS ANGELES COUNTY URBAN RUNOFF AND STORM WATER NPDES PERMIT

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit, which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

Discretionary projects, that fall into one of seven categories are identified in the NPDES Permit

as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units*

* (Note: this category is two separate categories in the NPDES Permit)

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements. These categories are:

Location adjacent to or discharging to an environmentally sensitive area, and
Parking lot 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

DEFINITIONS

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"100,000 Square Foot Commercial Development" means Developments based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

"Retail Gasoline Outlet" means a facility primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope and where grading contemplates cut or fill slopes .

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

"Restaurant" means a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

"Parking Lot" means land area or facility for the parking of commercial or business or private motor vehicles.

"Environmentally Sensitive Area" means an area designated as an Area of Special Biological Significance by the State Water Resources Control Board or an area designated as a Significant Natural Area by the California Resources Agency or an area designated as an area of Ecological Significance by the County of Los Angeles.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures,, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both treatment control BMPs and source control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Infiltration" means the downward entry of water into the surface of the soil.

"Directly Connected Impervious Area (DCIA)" means the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

Redevelopment" means, on an already developed site, the creation or addition of impervious surfaces: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces .

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes , (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMPs contained herein to be consistent with the code, except where those practices would defeat or circumvent the intent of the SUSMP requirements.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate may result in a foreseeable increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable , the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as

approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* . USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question..

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

If applicable, project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.
Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.
Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following *structural BMP* requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, treatment control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, this verification will include the developer's signed statement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any treatment control BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the treatment control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If treatment control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Treatment control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS

Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

Post-construction Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. each runoff event up to and including the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial,* (1993), or

3. the volume of runoff produced from each and every storm event up to and including 0.75 inch of rainfall, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from each and every storm event up to and including a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a. the roofing materials will not be a source of pollutants of concern in storm water, and

b. storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c. roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly or indirectly discharge to a natural stream or unlined channel or channel segment scheduled for restoration.

Exclusions

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the requirements of this Section.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the

following BMPs:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that deposit on these surfaces from motor vehicle traffic. These pollutants are directly transported to surface waters.

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code inc incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. Recognized situations of impracticability include (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because an underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately approved by the Regional Board Executive Officer before it becomes recognized and effective. A waiver granted to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPS

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

A Permittee may elect to accept a signed certification that the plan meets the criteria established herein and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria, in lieu of conducting detailed BMP review to verify treatment control BMP adequacy. The training must have been conducted by an organization with storm

water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, or the California Water Environment Association) with the training and curriculum accepted by the Regional Board Executive Officer. For the certification to be valid, training must have been received not more than two years prior to the signature date on the plan.

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988 Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs.	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil/Water separators
- Catch basin inserts
- Continuous flow deflection/ separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

STANDARD URBAN STORM WATER MITIGATION PLANS

SUMMARY OF COMMENTS RECEIVED AND RESPONSE

The comments received on the Standard Urban Storm Water Mitigation Plans (SUSMPs) and Regional Board staff response is divided into two sections. The first sections, lists main issues and staff response in detail. The second section summarizes all significant comments received by the Board on SUSMP before December 6, 1999, and the staff response including any actions taken to address the comment.

A. MAIN ISSUES AND RESPONSE

1. **Comment**:The Regional Board lacks regulatory discretion to establish a numerical mitigation measure for storm water treatment.

Response: The municipal storm water permit for Los Angeles County and Cities requires that SUSMPs achieve specific objectives which include to (i) minimize adverse impacts to natural communities; (ii) maximize infiltration to the extent practicable; (iii) minimize parking lot pollution; (iv) provide for appropriate controls to reduce storm water pollutant loads.[1] Staff interprets this provision of the permit, underlying federal law, and the statutory standard of Maximum Extent Practicable (MEP) as requiring SUSMPs to incorporate numerical mitigation measures for development planning projects in order to achieve compliance with water quality standards. Without a numerical mitigation measure, developers will select no treatment BMPs because there will be no BMP sizing guideline. Board Resolution No. 99-03 which states that "The Permittees shall select and require implementation of the most effective BMPs,...." will then be without effect.[2]

The 1987 Clean Water Act amendments give USEPA and States considerable discretion on establishing provisions for implementation in storm water programs.[3] Further, interim USEPA policy guidelines on BMPs for storm water programs explains that the permitting authority can require more specific conditions or limitations to meet water quality

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[1] Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles (Board Order No. 96-054; NPDES No. CAS614001). Part 2. III.A.2)

[2] The Regional Board adopted Resolution No. 99-03 approving BMPs for Development Planning and Development Construction on April 22, 1999.

[3] 33 U.S.C. Section 1342(p)(B)(iii). "require controls to reduce the discharge of pollutants to the maximim extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of pollutants."

standards where adequate information exists.[4] In addition, courts accord administrative agencies a high degree of deference in the areas of law they regulate.[5]

2. **Comment:** Anti-degradation policy prohibits new construction when water quality is already impaired.

Response: The municipal storm water permit in agreement with federal storm water regulations requires controls on new development to reduce storm water pollution. There is no prohibition on new construction.

3. **Comment**: The numerical mitigation criteria mandates the capture of storm water which will require expensive land acquisition cost.

Response: The numerical mitigation measure defines the definite volume of storm water that must be treated for water quality benefits. Treatment is the application of any physical, biological, or chemical method that can be used to remove pollutants in storm water. Providing storage volume for the runoff or capture is one form of treatment. It is not mandatory and other options may be considered such as reducing impervious cover and promoting infiltration.

4. **Comment**: The proposed numerical mitigation measure is not based on science and is an arbitrarily agreed to number in settlement of a lawsuit.

Response: The proposed numerical measures are technically defensible. The measures are based on the principle that most rainfall events are in the smaller range and higher rainfall runoff producing events are less frequent. Designing storm water treatment controls for the smaller events will reduce storm water pollutant loads significantly while optimizing BMP costs. The primary numerical method to determine BMP design criteria is the maximized water quality treatment volume method recommended by the American Society of Civil Engineers (ASCE). The 0.75-inch rainfall event method happens to be also the one that was agreed to in a lawsuit settlement agreement between the NRDC and the County of Los Angeles. The four methods proposed as choices are equivalent variants and in a technical comparison were in agreement to within 10% of one another. It is highly probable that parties that settle a litigation select a numerical criterion that is reasonable and factual.

5. **Comment**: The numerical mitigation measure will require implementation of BMPs that have not been proven to be effective in the region.

Response: The proposed numerical mitigation measure defines the quantity of storm water (volume) that has to be treated to remove pollutants. This criterion does not in anyway describe the effectiveness of BMPs to be used. The effectiveness of any particular BMP is dependent on design parameters and the range for its applications. Physical geography has little influence on the effectiveness of BMPs while proper

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[4] 61 Fed. Register 43761. "The interim permitting approach uses best management practices in first-round strom water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate."

[5] See, e.g., Chevron U.S.A. v. Natural Res. Def. Council, (1984) 467 U.S. 837

maintenance is a big factor. Information on BMP effectiveness can be found in research reports and national BMP databases. The numerical mitigation measure in combination with the effectiveness of a BMP determines the overall annual load of pollutant that can be removed.

6. **Comment**: The post-construction treatment BMPs will require costly maintenance

Response: Treatment BMPs do require proper maintenance and maintenance costs are BMP specific. Poor or non-existent maintenance will result in an ineffective BMP. Information on BMP maintenance costs can be obtained from national databases and reports. See references in the Record of Decision. A cursory review indicates that maintenance costs are reasonable.

7. **Comment**: The Regional Board did not perform an economic analysis required by State and Federal law.

Response: The implementation of a federal regulation does not require separate economic analysis. A relative quantitative comparison performed with similar criteria for storm water management or flood control, sediment removal from construction, combined animal feedlot operations, and State of Washington water quality criteria indicated that the numerical mitigation criteria would cost about three to ten times less. In addition, staff performed BMP cost calculations for an actual site in Los Angeles in the process of development and determined that the mitigation criteria cost is less than 0.5 percent of the project cost.

8. **Comment**: The Regional Board did not provide adequate public notices to interested parties.

Response: Regional Board action was not contemplated at the September Regional Board meeting and thus no public notice was necessary. Nevertheless, Board staff provided a 30-day public notice and mailed a copy to all parties on file. Staff was unable to verify the claim by some that they did not receive copies of the public notice or provide an explanation. Staff will again provide 30 day-notice of the proposed action on the SUSMPs scheduled by the Regional Board for January 6, 2000.

B. SUMMARY OF ALL SIGNIFICANT COMMENTS AND RESPONSE

COMMENTER	COMMENT	RESPONSE	ACTION
General City of Los Angeles, Western States Petroleum Association	1. Conduct first a quantitative review of the basis of designation of selected categories as priority-planning projects.	The categories are designated in the permit and were selected based on risk sources data compiled in the first term of permit implementation.	No action necessary
Los Cerritos Channel Task Force	2. Provide level playing field for unincorporated and incorporated cities within LA County	Four methods of determining the mitigation measure are provided to ensure some flexibility. The methods are equivalent. See ROD	Four equivalent methods included as mitigation criteria in SUSMP

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	3. No other MS 4 permits in California require numerical criteria for runoff mitigation	All MS4 permits are required to have controls on new development and redevelopment that will reduce pollutants to the MEP. The USEPA has identified the lack of specific criteria as a deficiency in its Report to Congress ON Phase II (1999)	No action necessary
SCAG	4. Provide the opportunity for the development of regional BMPs instead of site by site requirements	May be considered by Board in a Resolution	Will suggest interest to Regional Board
SCAG	5. Make the numerical mitigation measure voluntary pilot program for the first two years.	Federal laws and regulations require that controls on new development and redevelopment be enforceable	No action necessary
Santa Monica	6. More studies not necessary to establish mitigation criteria and evaluate BMPs	We agree that there exists sufficient information to establish numerical mitigation criteria and to design BMP for optimum performance and effectiveness.	No action necessary
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	7. Numerical mitigation measure is an unfunded mandate	Implementation of a federal permit program is not an unfunded mandate as described in the State constitution. See memo from legal counsel.	No action necessary
Bellflower, Claremeont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Long Beach, Los Angeles, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Clarita, Santa Fe Springs, Vernon, Whittier, BIA, EAC, New Hall Land and Farming, Long Beach Chamber of Commerce	8. Numerical mitigation measure is not based on sound science	Disagree. Our review of local data and implementation programs in states such as WA, FL, and MD indicates that the approach to establishing numerical mitigation measure is scientific and reasonable. The methods have also been endorsed by national science and engineering associations.	References to important documents provided in the SUSMP. A bibliography of references reviewed for the action is included in the ROD.
Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Long Beach, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	9. Treatment controls will be required irrespective of siting factors limiting application.	Site conditions will determine what BMPs are appropriate. A provision for waiver is provided where mitigation may be infeasible. Mitigation banking may be an alternative.	Waiver provision has been included in the SUSMP where impracticability is established.
Covina, Irwindale, La Mirada, Lomita, Norwalk, Whittier	10. Provide sufficient time for Council of Governments to review and comment	Staff will mail and e-mail copies to SCAG for distribution to COGs.	Staff will mail public notice of proposed action to SCAG and COGs.
Cerritos, Diamond Bar	11. Developers will move to build in counties without numerical mitigation measures.	The mitigation measure requirement for new development is based on federal law. Other Regional Boards are likely to develop and evaluate compliance using similar criteria. The USEPA considers the absence of numerical storm water BMP design criteria for new development a deficiency. See USEPA Phase II Final Rule	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, , Long Beach, Lynwood, Maywood, Montebello, Paramount Glendora, , Norwalk Rancho Palos Verdes, Santa Fe Springs, Whittier, Truxaw and Associates, Long Beach Chamber of Commerce	12. BMPs will require costly maintenance	Maintenance of BMPs is essential and strategies to support maintenance activities are discussed in USEPA's Phase II Final Rule.	No action necessary.
Azusa, Claremont, EAC	13. Perform cost benefit analysis	The implementation of federal law does not require a separate cost benefit analysis. Relative cost comparisons and BMP cost calculations performed indicate that the cost of the mitigation measure is reasonable for the water quality benefits it will bring.	No action necessary
Centex Homes, Desert Partners, Bill Ehrlich, FORMA, Engineering Contractors Association, Greystone Homes, John Laing Homes, Mid-cities Escrow, JTL, New Hall Land and Farming, New Urban West, Pace Engineering, Pacific bay Homes, Pacific Soils Engineering, David Placek, Psomas, Ramseyer, Rasmussen, Shea Homes, Sikand, Southern California Contractors, Southern California Ready Mix Concrete Assoc., South Place Corp., SunCal Co., Taylsor Woodrow., Tetra Tech, Van Tilburg and Associates, Warmington Homes, Western Pacific Housing, LA County Supervisor Knabe.	14. SUSMP is stringent enough without the numerical mitigation measure	Without the numerical mitigation measure the SUSMP does not provide adequate guidance on design criteria for BMPs. Thus no treatment BMPs or BMPs inadequately sized may be selected with no benefit to water quality. The USEPA in the preamble to Phase II Final Rule makes the same observation.	No action necessary.
Technical Heal the Bay, American Oceans Campaign, Friends of the LA River, NRDC, Kudo and Daniels, Fusion Films, Santa Monica BayKeeper, Ballona Wetlands Foundation, AHHA, H & K Interiors, Kinsella & Associates, AKERS Entertainment, Ballesteros, Stenstrom-UCLA, Chatten Broan & Assoc., South Bay SurfRider (13 members), Shatz	15. Establish for all municipalities in LA County the 0.75-inch mitigation measure or similar criteria for development planning currently in effect for the unincorporated areas.	The proposed criteria provide for the treatment of 0.75 inch or equivalent volume of runoff from new development for all areas of LA County within the jurisdiction of the Regional Board.	Criteria is made applicable to all MS4 permittees in LA county
Heal the Bay, American Oceans Campaign, Friends of the LA River,	16. Require SUSMPs for development in environmentally sensitive areas	The requirement is included for the City of Long Beach but was not one of the priority categories specifically identified in the LA County MS4 permit.	This category has been added to the SUSMP.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	17. Require mitigation of runoff from parking lots separately in each SUSMP	This is not one of the priority categories specifically identified in the LA County MS4 permit. Commercial categories specifically included have indicated that they are no different than parking lots. In addition, the Coastal Commission has often consulted the Board for appropriate BMPs and criteria.	This category has been added to the SUSMP.

COMMENTER	COMMENT	RESPONSE	ACTION
NRDC	18. Apply SUSMP requirement broadly rather than limit it to seven categories	A BMP checklist is already required for other priority projects. Expanding the SUSMP requirement may be appropriate once TMDLs have been allocated and other significant sources need to be controlled.	Two categories have been added: locations in environmentally sensitive areas, and parking lots.
County of Ventura and cities	19. Include an alternative method based on volumetric and flow which uses capture of annual runoff and peak flow rate control	An equivalent volumetric method is provided based on annual volume capture. Flow rate controls are left to the judgement of the local agency.	Eight five percent treatment of annual runoff volume is provided as an equivalent mitigation criteria.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	20. Define hillside development and not defer definition to the local municipality	Will provide a general definition.	Defined in SUSMP.
Heal the Bay, American Oceans Campaign, Friends of the LA River,	21. Apply requirements for retail gasoline outlets to any facility with a fuelling dispenser.	This is not one of the priority categories specifically identified in the LA County MS4 permit. Expansion of the applicability may be appropriate once TMDLs have been allocated and other significant sources need to be controlled.	No action necessary
WSPA, San Gabriel Basin Water Quality Authority	22. Requirement for infiltration will promote pathways for groundwater and soil contamination	Risks for ground water contamination exist under certain situations. These are identified in a report by the USEPA (1993). Pre-treatment of storm water will reduce such risks. The soil acts as a natural filter and self regenerates.	A section is included in the SUSMP describing the limitations of infiltration BMPs.
Truxaw and Associates	23. Promote non structural BMPs	SUSMPs already require source control BMPs in addition to structural BMPs and treatment control BMPs	No action necessary.
Land Tech Engineering	24. Provide design specifications for BMPs based on criteria	Expect that BMP design specification will be developed by the municipalities based on the numerical mitigation measure. Interim BMP design information may be obtained from manuals developed by other states.	No action necessary.
Centex Homes, Engineering Contractors Assoc., John Laing Homes, Land Tech Engineering, Pace Engineering, Pacific Soils Engineering, David Placek, Ramseyer, Rasmusen, Sikand, Southern California Contractors, Southern California Ready Mix Concrete Assoc., Tetra Tech, South Place Corp., Taylor Woodrow, Western Pacific Housing, LA New Car Dealers Ass.	25. Staff proposal requires capture which is not the same as infiltration or treatment	Storm water capture is not mandatory. The proposal only requires that a certain quantity of storm water be treated with BMPs to remove pollutants in one of several ways.	No action necessary.
Vernon, Los Angeles	26. Require similar criteria for USEPA Phase I industrial facilities	The requirements are for new development in selected categories. Expansion to other categories may be considered for the next permit term. Will recommend application to construction permits in the LA Region covered by the State General Storm Water permit for construction activity.	Will propose to the Board to consider in its Resolution that the same
Brash,	27. Filter media is not an effective BMP	Disagree. Filter media are effective BMPs if properly configured. See letter to Brash from RB Executive Officer date Oct. 19, 1999.	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Clarita	28. Provide criteria for flow based controls in addition to volumetric based controls	Flow based controls which are essential to maintain BMP effectiveness, reduce flow velocities, minimize downstream erosion potential, and prevent over bank flooding are left to the judgement of the local agency.	A statement has been included in the SUSMP that flow design criteria be determined by the local agency.
Santa Clarita	29. Limit application of criteria to impervious surfaces	The criterion is applied to the whole area. Credit for the pervious areas is automatically considered through the runoff coefficient. Roofing areas have been excluded for commercial facilities.	No action necessary.
Santa Clarita. EAC	30. Provide greater flexibility in application of the mitigation criteria	The four methods of selecting the numerical mitigatio through criteria and waiver procedures offer sufficient flexibility in application	Provide in the SUSMP four equivalent methods of determining the numerical mitigation measure.
Los Angeles	31. The numerical mitigation measure should be a guidelines and not a requirement for land development	Federal laws and regulations require that controls on new development and redevelopment be enforceable.	No action necessary.
Legal Los Angeles	32. Setting a numerical mitigation measure is a discretionary action. Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA.	The requirements under an NPDES permit are exempt from review under CEQA. Preliminary costing estimates indicate that they are reasonable.	No action necessary.
Los Angeles	33. Identify the regulatory authority, which authorizes the Regional Board to establish the numerical mitigation measure.	Regulatory requirement is found at 40 CFR 122.26 (d)(2)(iv)(A) (2). Statutory authority is at 33 USC 342(p)(B)(iii). See also court's opinion in Defenders of Wildlife v. Browner (No. 98-71080) (9th Cir. 1999) and in NRDC v. USEPA 966 F2d. 1292 (9th Cir. 1992)	No action necessary.
Los Angeles	34. Setting a numerical mitigation measure is a discretionary action. Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA.	The requirements under an NPDES permit are exempt from review under CEQA. Preliminary costing estimates indicate that they are reasonable.	No action necessary.
Western States Petroleum Association (WSPA)	35. Postpone consideration because of inadequate notice.	A thirty-day notice on this action has been provided. A thirty-day notice on the September 1999 Board meeting was provided even though it was not required for a Regional Board Information item.	No action necessary.
Apartment Association, BIA	36. There is no regulatory requirement that there be a numerical measure	Disagree. See detailed explanation under main issues and response.	No action necessary.
NRDC	37. Receiving water limits and anti-degradation policies apply independently from mitigation criteria.	Agree that mitigation standards are separate from the numerical mitigation measure. The Office of Chief Counsel confirms that MS4 programs must meet water quality standards in a memo dated October 14, 1999	No action necessary.
Burke, Williams & Sorenson	38. Provide broad legal authority for the SUSMP requirement	We will include legal citations that are relevant to the jurisdiction of the Regional Board.	Relevant laws are cited in the SUSMP to provide legal justification.
Burke, Williams & Sorenson	39. Delay SUSMP requirements in light of PL 106-74 requiring USEPA to submit reports to Congress.	The USEPA has already submitted the reports to Congress and thus no delay is warranted.	No action necessary.

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Monica BayKeeper	40. New development can be prohibited under the Federal Anti-degradation policy if it degrades or adds pollutants to local waters	Disagree. See detailed explanation under main issues and response.	No action necessary.
EAC. Downey. Lakewood	41. Provide authority in the Clean Water Act to regulate flow to address water quality.	The U.S. Supreme Court has held that regulation of flow to protect beneficial uses is within the authority of the Clean Water Act PUD No. 1 v. WA Dept. of Ecology, 511 U.S. 700 (1994)	No action necessary.

TENTATIVE

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION

Resolution No. xx-xx

APPROVING THE RECORD FOR
STANDARD URBAN STORM WATER MITIGATION PLAN
FOR
MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS
IN LOS ANGELES COUNTY

WHEREAS, THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FINDS:

1. On July 15, 1996, a municipal storm water permit was issued to the County of Los Angeles and 85 incorporated cities to control and minimize the discharge of pollutants associated with storm water and urban runoff. This permit became Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles.

2. On June 30, 1999, a municipal storm water permit was issued to the City of Long Beach which removed the City of Long Beach from Board Order No. 96-054, giving the City of Long Beach its own distinct Municipal Storm Water and Urban Runoff NPDES permit, Regional Board Order No. 99-060, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the City of Long Beach.

3. On August 19, 1999, a statewide general storm water permit for construction activity was adopted by the State Water Resources Control Board (State Board). This permit became State Board Order No. 99-08-DWQ, and applies to construction projects that disturbs five acres or more or is part of a larger common plan of sale in the Los Angeles region.

4. Many of the rivers and streams in Los Angeles County are formally designated as impaired, pursuant to Section 303 (d) of the federal Water Pollution Control Act, for specific pollutants that are commonly found in storm water and urban runoff.

5. Storm water runoff carries with it many pollutants in varying concentrations that are suspended in, and or dissolved, in the runoff. The sources of these pollutants include nearly all properties that have been developed since the pollutants originate through the many diverse activities of habitation and land use. Pollutants generated from individual property developments vary greatly in the concentration or loading of each pollutant. Generally, the relative contribution of the pollutant from runoff from any individual property development will represent only a small portion of the entire loading of a water body given the many square miles of land upon which storm water runoff is generated. When the individual contributions from tens of thousands of discrete property units are aggregated, the pollutant loading becomes significant. The resultant pollutant loads results in the impairment of that water body and the conveyance of pollutants, including sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides to the ocean and harbors within Los Angeles County. The loading of pollutants generated in the Los Angeles area are being measured through the monitoring program being conducted by the Los Angeles County Department of Public Works in conformance with its obligations as the Principal Permittee under the Los Angeles County Municipal Storm Water and Urban Runoff NPDES permit.

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6. The nature of property use is related to the types and quantities of pollutants that are transported from that property during a rainfall event.

7. As property is developed or redeveloped, the utilization of Best Management Practices provide an opportunity to reduce the loading of pollutants to water bodies. This is accomplished by various techniques and can be passive (source reduction) or active (treatment). As property is developed from undisturbed lands, the project can be designed to incorporate structural BMPs that would normally not be available or practical to use on property that has been in urban use.

8. BMPs are effective means of reducing pollutants and treatment control BMPs can be "designed-into" a project in a cost effective way and in a manner that is either transparent to or which enhances the use to which the property has been placed. Some BMPs encourage the setting aside of areas as a greenbelt to allow storm water runoff to flow over areas which are permeable, thereby allowing all or a portion of the runoff to infiltrate. Other BMPs can be designed and built into structures such as catch basins that incorporate replaceable filters to absorb oily wastes or by installing screens to prevent litter from passing through the system and into the water body.

9. Arrays of treatment control BMPs are available to developers of both new and redevelopment properties. The use of BMPs is already required by the terms of the Los Angeles County and Long Beach Municipal Storm Water and Urban Runoff NPDES permits.

10. The ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time. A BMP that can only be effective for a small volume of storm water runoff is inherently less effective than one sized to accommodate a larger volume of water.

11. Storm water runoff will normally convey a disproportionate loading of pollutants in the initial period runoff is generated during a storm event. Storm events generating up to 0.75 inches of precipitation, measured over a 24-hour period, constitute 85 percent of the total amount of runoff that can be expected during an average wet season. Designing a BMP to be able to accommodate this amount of runoff will result in the application of a BMP intervention to all but 15% of the total runoff during a year, and usually all of the critical runoff that occurs in the early phase of the precipitation event, commonly referred to as the "first Flush."

12. Both the Los Angeles County (Part III.A.1.c) and the Long Beach Municipal Storm Water and Urban Runoff permits contain provisions related to the adoption of Standard Urban Storm Water Mitigation Plans (SUSMPs) requiring their development and implementation.

13. Standard Urban Storm Water Mitigation Plans are required for a specified set of discretionary "Priority Projects" and the permit specifically identifies seven distinct categories for which SUSMPs are required to be prepared. The permit specifically states that the seven categories of "Priority Projects" are the minimum categories requiring SUSMPs.

14. Standard Urban Storm Water Mitigation Plans are also required for development or redevelopment of Parking Lots 5,000 square feet or greater and Locations in Environmentally Sensitive Areas. These categories have been added to advance efforts to control storm water pollution beyond the minimum in Los Angeles County.

15. Standard Urban Storm Water Mitigation Plans are required to be approved by the Regional Board Executive Officer following which they are to be implemented by the Permittees and used by the Permittees as the minimum criteria for the approval of project specific Urban Storm Water Mitigation Plans and the issuance of grading or building permits to project applicants.

16. The statewide general storm water permit for construction activity requires that Storm Water Pollution Prevention Plans (State SWPPPs) contain post-construction BMPs that will be implemented after construction is complete.

17. Section 402 (p) of the Clean Water Act requires the Administrator of the United States Environmental Protection Agency or her designated agent, in this instance, the Regional Board, to require as part of the storm water program "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [USC Section 1342 (p)(3)(B)].

18. A recent decision of the United States 9th Circuit Court of Appeals, Defenders of Wildlife v. Browner (1999) Case No. 98-71080, provides additional support and clarification of the authority of the Administrator and the Regional Board to impose additional controls on storm water pollution. The Court in Defenders of Wildlife v. Browner said that the USEPA and the States have discretion under the law to determine what pollution controls are appropriate to achieve compliance.

19. Pursuant to the requirements of Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, the Regional Board Executive Officer received a proposal for Standard Urban Storm Water Mitigation Plans submitted by the Principal Permittee.

20. Upon the review of the Regional Board Executive Officer, the Standard Urban Storm Water Mitigation Plan submitted for the seven applicable categories was deemed inadequate. A revised SUSMP proposal was developed subsequent to a discussion of the proposal's conceptual foundation at a public workshop held on August 10, 1999. This workshop was well attended with over 80 municipal representatives and interested parties participating.

21. On August 16, 1999, a public notice was issued indicating that the Standard Urban Storm Water Mitigation Plans proposed by the Principal Permittee would be augmented by the addition of criteria related to specifying numerical design criteria for BMP construction. The matter was noticed for the Regional Board's September meeting to allow the issue to be discussed before the Board although no formal action of the Regional Board itself is required for SUSMP approval.

22. On September 16, 1999, the Regional Board conducted a public hearing on the Standard Urban Storm Water Mitigation Plan proposal as amended by the Executive Officer. At that hearing, the Regional Board Executive Officer suggested additional time would be necessary to develop a more comprehensive proposal incorporating the comments received at the public hearing.

23. Between September 16 and December 3, 1999, the Regional Board Executive Officer met with interested parties to discuss comments and concerns from interested parties.

24. The Southern California Council of Governments (SCAG) has indicated its interest in obtaining funding to prepare a regional plan(s) to address storm water pollution and identify regional treatment solutions for implementation.

25. On December 7, 1999, the Regional Board Executive Officer released a revised Standard Urban Storm Water Mitigation Plan document to interested parties.

THEREFORE BE IT RESOLVED THAT:

1. The Regional Board endorses the Standard Urban Storm Water Mitigation Plan prepared by the Regional Board Executive Officer and noticed to the public on December 7, 1999 and the concepts therein relating to numerical storm water mitigation standards for Best Management Practices; and

2. The Regional Board encourages the Regional Board Executive Officer to approve the Standard Urban Storm Water Mitigation Plan at the earliest opportunity incorporating any specific changes recommended and formally approved by the Regional Board at the January 6, 1999 Board Hearing;

3. The Regional Board adopts the approved requirements as provisions applicable to the SUSMP requirements for the City of Long Beach.

4. The Regional Board adopts the numerical mitigation standards for storm water, endorsed herein, as the minimum design criteria for review of post-construction BMPs in the Los Angeles Region for construction projects subject to coverage under the state storm water general permit for construction activity.

5. The Regional Board encourages the Permittees and all interested parties to work together in a spirit of cooperation to effect the implementation of the Standard Urban Storm Water Mitigation Plan at the earliest possible date, and

6. The Regional Board encourages the efforts by the Southern California Council of Governments and area Council of Governments (COGs) to develop regional plans and identify regional solutions to address storm water pollution from new development and redevelopment.

I, Dennis Dickerson, Executive officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 6, 2000.

DENNIS A. DICKERSON
Executive Officer

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

~~LOS ANGELES COUNTY URBAN RUNOFF AND STORMWATER NPDES PERMIT~~
LOS ANGELES COUNTY URBAN RUNOFF AND STORM WATER NPDES PERMIT

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, ~~required~~ **requires** the development and implementation of a program addressing storm water pollution issues in development planning for private projects. **The same requirements are applicable to the City of Long Beach under its separate municipal storm water ~~permit which~~permit, which was issued on ~~April~~ June 30~~xx~~, 1999.**

The requirement to implement a program **for~~addressing~~** development planning is based on, **federal and state statutes including ~~among other things ,~~: ~~the primary objectives of~~ Section 402 (p) of the Clean Water Act, Section 6217 of —the Coastal Zone Act ~~Reauthorizations~~Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. ~~, and t~~**The ~~1987 amendments to the~~ Clean Water Act **amendments of 1987** ~~that~~ established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES **program~~permit~~**. –The primary objectives **of the municipal storm water program requirements** are to:

~~Effectively prohibit non-storm water discharges, and~~

- **Effectively prohibit non-storm water discharges, and**

- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable.

Thi~~s~~e Standard Urban Storm **W**~~w~~ater Mitigation Plan (SUSMP) was developed as part of the **municipal storm water** program **to** address~~ing~~ **storm water pollution from new** Development **and Redevelopment** ~~Planning for~~ **by** the private sector. Thi**s**e SUSMP contains a list~~ing~~ of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee **and applied generally or on a case by case basis.** ~~?~~ **This**~~A~~ SUSMP **applies to** ~~is required for~~ projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. Developers **must** ~~will need to~~ **incorporate** ~~implement~~ appropriate SUSMP requirements into their project plans. Each Permittee **will** ~~is then required to~~ approve an Urban Storm **W**~~w~~ater Mitigation Plan as part of the development process and prior to issuing building and grading permits **for the projects covered by the SUSMP requirements.**~~.~~

Discretionary projects ~~(as defined by CEQA)~~, that fall into one of ~~the~~ seven categories ~~of discretionary projects (as defined by CEQA)~~ are identified in the NPDES Permit as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units*

* (Note: this category is two separate categories in the NPDES Permit)

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements. These categories are:

Location adjacent to or discharging to an environmentally sensitive area, and

Parking lot 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

DEFINITIONS~~S~~
"

Greater than (>) 9 unit home subdivision" ~~is~~**means** any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"

100,000 Square Foot Commercial Developments" **means Developments** ~~are be~~ based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

"

~~A r~~Retail ~~g~~Gasoline ~~o~~Outlet" **means a facility** ~~is~~ primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" ~~is as defined by the local jurisdiction. For example, one jurisdiction defines "hillside" as a~~ **means** property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope ~~that is 25% or greater,~~ and where grading contemplates cut or fill slopes ~~30 feet high or greater.~~.

"A~~An a~~utomotive ~~r~~Repair ~~s~~Shop" ~~is~~**means** a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

"R~~A r~~estaurant" ~~is~~**means** a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

"~~A~~ Parking Lot" means land area or facility for the parking of commercial or business or private motor vehicles.

"Environmentally Sensitive Area" means an area designated as an Area of Special Biological Significance by the State Water Resources Control Board or an area designated as a Significant Natural Area by the California Resources Agency or an area designated as an area of Ecological Significance by the County of Los Angeles.

~~Structural BMPs~~

~~BMPs~~ **"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevents, controls, removes, or reduces pollution.**

"

Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures,, managerial practices~~institutional~~ or operational practices that aim to prevents storm water pollution by reducing the potential for contamination at the source of pollution.

"

Treatment Control BMP" means any engineered ~~or~~ system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

"

Structural ~~Control~~ BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category ~~can~~may include both treatment control BMPs and source control BMPs.

"Treatment" **means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.**

~~Infiltration~~**"Infiltration" means the downward entry of water into the surface of the soil.**

"Directly Connected Impervious Area (DCIA)" means the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

"

New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

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Redevelopment" means, on an already developed site, the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces ~~redevelopment, and any change in use that has the potential to discharge more or new pollutants.he~~.

~~A~~ "Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular ~~activty~~activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

~~**Limitations ????????????? (evaluate this original language provided by the County)**~~

~~***Should any conflict be discovered with these SUSMP requirements and any pre-existing regulation, the pre-existing regulation will prevail.***~~
~~***For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.***~~

CONFLICTS WITH LOCAL PRACTICES

Where p~~P~~rovisions of thes~~e~~ SUSMP requirements ~~may, at times, be in~~ conflict with established local **codes** ~~practices~~, (e.g., specific language of signage used on storm drain stenciling), ~~. T~~the Permittee may continue **the** local practices and modify the SUSMPs contained herein to ~~comport~~ **be consistent** with th~~o~~se ~~practices~~ **code**, except where those practices would ~~obviate~~ ~~negated~~**defeat or circumvent** the intent of the ~~mandated~~ SUSMP **requirements**.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

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1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development ~~P~~peak storm water runoff discharge rates shall not exceed **estimated** pre-development levels for developments where an increased peak storm water discharge rate may result in a **foreseeable**~~n~~ increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable ~~(MEP)~~, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna.
~~DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).~~

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the ~~MEP~~**Maximum Extent Practicable**. Those BMPs best suited for that purpose ~~are, at a minimum,~~ **are** those listed in the *California Storm Water Best Management Practices Handbooks*~~,~~; ***Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide***; ***Manual for Storm Water Management in Washington State***;~~,~~ ***The Maryland ~~BMP~~Stormwater Design Manual***; ~~,~~***Florida Development~~BMP~~ Manual: A Guide to Sound Land and Water Management***; ~~,~~**and** ***Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters*** ~~(1992)~~**, USEPA Report No. EPA-840-B-92-002,** ~~as~~ **as** "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. ~~However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants~~.

~~—~~Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. **Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.**

4. PROTECT SLOPES AND CHANNELS

If applicable, ~~the~~ project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- ~~With approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and game, I~~install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, **with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game**~~.~~

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5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.

Improper storage of materials outdoors ~~can allow~~ **may provide an opportunity for** toxic compounds, oil and grease, heavy metals, nutrients, ~~and~~ suspended solids**, and other pollutants** to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following *structural BMP* requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, ~~structural~~ **treatment control** BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions **through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.**

For all properties, this verification will **include**~~consist of having~~ the developer's ~~sign a~~ **signed** statement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any ~~structural~~ **treatment control** BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the ~~structural~~ **treatment control** BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If ~~structural~~ **treatment control** BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or

other appropriate public agency. ~~Structural~~ **Treatment control** BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR ~~STRUCTURAL~~ TREATMENT CONTROL BMPS

~~Structural~~ **Treatment control** ~~B~~BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

Post-construction Treatment Control ~~Structural~~ BMPs shall be designed to ~~either~~:

~~a. mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event up to and including 0.75 inches of rainfall, prior to its being discharged into a storm water conveyance system, or~~

~~b. mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event based on the 85th percentile 24 hour runoff event determined as the maximized storm water volume for the area as discussed in Urban Runoff Quality management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, prior to its being discharged into a storm water conveyance system, or~~

~~c.~~ **a.** ~~mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event based on the historical record based reference 24 hour rainfall criterion (0.75 inch for the Los Angeles County area) that achieves the same or greater reduction in pollutant loads achieved by the 85th percentile 24 hour runoff event, prior to its being discharged into a storm water conveyance system.~~

A.- mitigate (infiltrate or treat) storm water runoff from either:

1. **each runoff event up to and including the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or**

2. **the volume of annual runoff ~~volume,~~ based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or**

3. **the volume of runoff produced from each and every storm event up to and including 0.75 inch of**

rainfall, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from each and every storm event up to and including a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

-AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

~~In determining the area to be calculated in the above runoff mitigation criteria, the area included from roofing surfaces, may be excluded from the calculation provided:~~ **The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:**

a. the roofing materials **will not be a source of** ~~do not contribute to~~ pollutants of concern in storm water, ~~runoff,~~ and

b. **storm water** ~~runoff~~ from the roof**ing surfaces** ~~area~~ is diverted directly to a storm water conveyance system~~.~~**, and**

c. roof based exhaust systems, vents, filters, and air pollution control devices will not ~~be~~present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly or indirectly discharge to a natural stream or unlined channel or channel segment scheduled for restoration.

Exclusions

~~This Section does not apply to the r~~ Restaurants, ~~**automotive repair facilities, retail gasoline outlets**~~ **where**~~category if~~ the **land area for development or redevelopment is less than 5,000 square feet, –are excluded from the requirements of this Section.** ~~re is no parking lot associated with the development.~~

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10. —PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of

vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

~~E~~**Outdoor** equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- F~~Where feasible, f~~uel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design ~~plans which include fueling areas~~**plans, which include fueling areas,** must ~~include~~**contain** the following:

- ~~F~~**F**~~Where feasible, f~~uel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water~~ to the extent practicable~~.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer **or to a permitted disposal facility.**~~.~~

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking ~~is usually accommodated on asphalt or concrete and thus parking~~ lots contain ~~generate a lot of directly connected impervious area. P~~pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that deposit on these surfaces from motor vehicle traffic. These pollutants are ~~thus can be~~ directly transported to surface waters.

- **Reduce impervious land coverage of parking areas**
- **~~and f~~Infilte~~r~~rate runoff before it reaches storm drain system.**
- **Treat runoff before it reaches storm drain system**

2. PROPERLY DESIGN TO ~~REMOVE~~LIMIT OIL AND PERFORM MAINTENANCE

Parking lots ~~that have heavy use~~ may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- **Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food ~~places,~~ outlets, lots with 25 or more parking spaces ~~convenience stores~~, sports event parking lots, shopping malls, grocery stores, discount warehouse stores)**
- **Ensure adequate operation and maintenan~~ent~~ce of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control**

~~See LB permit~~
~~LOCATION IN ENVIRONMENTALLY SENSITIVE AREAS~~

11. ~~VARIANCES~~ WAIVER

A Permittee may, through adoption of an ordinance or code inc **inc**orporating the **treatment requirements of the~~se~~** SUSMP~~s~~, provide for a **waiver~~variance process~~ from the requirement if impracticability** ~~to ensure that SUSMP requirements that are not appropriate~~ for a specific property ~~development~~ **can be established. Recognized situations of impracticability include (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because an underground source of drinking water is less than ~~ten~~10 feet from the soil surface. Any other justification ~~cause~~ for impracticability** ~~However, the variance issued by the Permittee~~ must be **separately** approved by the Regional Board~~'s~~ Executive Officer before it becomes **recognized and effective~~effective~~. A waiver granted to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.~~.~~**

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.~~.~~

12. ~~12.~~ LIMITATION ON ~~U~~USE OF INFILTRATION BMPS ~~S~~

~~Infiltration BMPs are not recommended for areas of industrial activity or areas subject to~~

~~high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not adversely impacted.~~ Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

~~In some locations where groundwater resources may be adversely affected by the infiltration of pollutants carried by storm water runoff, infiltration BMPs are not required. These areas are identified (HOW?) ???? What do we do in place of infiltration.~~

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

~~A~~

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

A Permittee may elect to accept a signed certification that the plan meets the criteria established herein and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria, in lieu of conducting detailed BMP review to verify treatment control BMP adequacy. The training must have been conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, or the California Water Environment Association) with the training and curriculum a~~uthorized~~ccepted by the Regional Board Executive Officer. For the certification to be valid, training must have been received not more than two years prior to the signature date on the plan.

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~~TABLE 1: SUGGESTED RESOURCES~~

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (199~~7~~9) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988~~BMP Manual Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler~~ Presents detailed ~~engineering~~ guidance for designing BMPs ~~guidance on ten different stormwater filtering systems.~~	Florida Department of the Environment~~Center for~~ 2600 Blairstone Road, Mail Station 3570~~Watershed Protection~~ Tallahassee, FL 32399 ~~8391 Main Street Ellicott City, MD 21043 410-461-8323~~850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design~~BMP~~ Manual ~~for Use of Bioretention in Stormwater Management~~ (1993~~9~~) Presents guidance for designing ~~bioretention facilities~~storm water BMPs.	Maryland Department~~Prince George's County~~ of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000~~Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785~~

Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of ~~thorough look at stormwater practices including~~, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service~~(Check in office)~~ U.S. Department of Commerce ~~Watershed Management Institute, Inc.~~ Springfield, VA 22161 800-553-6847~~410 White Oak Drive~~ ~~Crawfordville, FL 32327~~ ~~850-926-5310~~
Caltrans~~iforn~~ia Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1993~~8~~) ~~for Construction Activity, Municipal, and Industrial/Commercial~~ Presents guidance for design of storm water BMPs ~~a description of a large variety of structural and good housekeeping BMPs.~~	California Department of Transportation ~~Los Angeles~~ -P.O. Box 942874 Sacramento, CA 94274-0001~~County Department of Public Works~~ ~~Cashiers Office~~ ~~900 S. Fremont Avenue~~ ~~Alhambra, CA 91803~~ ~~626~~916-653-2975~~458-6959~~

TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff ~~of DCIA,~~ to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.

- Vegetated swales and strips ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

- Extended/dry detention basins
- **Infiltration basin ~~(Applicability and design criteria to be determined by the local jurisdiction)~~**
- **Infiltration trenches**

~~Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)~~

~~Infiltration trenches~~ • ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

- Wet ponds ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

- Constructed wetlands ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

~~-•~~

Oil/Water separators ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

~~-•~~ Catch basin inserts ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

~~•~~

-Continuous **flow** deflecti~~veon~~/ separation ~~units~~**systems** ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

~~•~~

-Storm drain inserts ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

- Media filtration ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

~~-•~~

-Bioretention facility ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

- Dry-wells ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

- Cisterns ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

~~-•~~

-Foundation planting ~~(Applicability and design criteria to be determined by the local jurisdiction)~~

- **Catch basin screens**
- **Normal flow storage/ separation systems**
- **Clarifiers**
- **Filtration systems**
- **Primary waste water treatment systems**

~~**Check against Board BMP Resolution**~~

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DRAFT

SUSMP REQUIREMENT FOR STORMWATER RUNOFF MITIGATION CALCULATIONS

[These calculations are performed as examples to show different approaches of calculating runoff capture volumes and methodologies of selecting and sizing treatment BMPs]

PREPARED BY: SHOBUZ A. IKBAL
CHECKED BY: WING K. TAM

REQUIREMENT: 85th percentile runoff capture

PROJECT: Light industrial warehouse/office with parking lot in South Central L. A.

PROJECT SIZE: 240,000 ft^2 = 5.51 acres

OPTION 1: DETENTION BASIN

(a) WEF Manual of Practice #23 – Chapter 5

Maximized detention volume, $P_o = a\ C\ P_6$ [WEF, Pg. 175]

For 85th percentile event capture for 24 hours

Regression constant, a = 1.299 [WEF, Table 5.4, Pg. 177]
Mean storm depth, P_6 = 0.67 in. [WEF, Figure 5.3, Pg. 176]
(Note: Local precipitation record can be used to calculate more accurate P_6 for the site)
C = 0.9086 [LAMC, Code 3300]

=> P_o = 1.299 x 0.9086 x 0.67 = 0.7908 inch

⇨ Required storage volume = P_o x Area of the site
= (0.7908 in / 12) x 240,000 ft^2
= 15,815 ft^3 = 118,296 gal.

➔ Basin size ≈ 40'W x 40'L x 10' D

(b) Using 0.75" As The 85th Percentile Capture For 24 Hours

P_o = 0.75 in.

⇨ Required storage volume = (0.75 in / 12) x 240,000 ft^2
= 15,000 ft^3 = 112,200 gal.

➔ Basin size = 40'W x 40'L x 9.5'D

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(c) California Stormwater BMP Handbook

For 85th percentile capture for 40 hours [Industrial Handbook, Pg. D1]

Unit basin storage volume = 0.06 ac-ft/ac [Industrial Handbook, Pg. D7]

⇨ Required storage volume = Unit basin storage x Area of site
= 0.06 ac-ft/ac x 5.51 ac
= 0.3306 ac-ft
= 14,401 ft^3 = 107,719 gal.

➔ Basin size = 40'W x 40'L x 9'D

OPTION 2: VEGETATED SWALE AND INFILTRATION TRENCH

(i) VEGETATED SWALE – For Parking Lot Runoff
[Using WEF Manual of Practice #23]

Area of the parking lot, A_p = 110,000 ft^2 = 2.525 ac.

Mean storm, P_6 = 0.67 in. [WEF, Fig. 5.3, Pg. 176]

Runoff coefficient, C = 1 [WEF, Pg. 191]

Drain time = 12 hours [WEF, Pg. 191]

Regression constant, a = 1.109 [WEF, Table 5.4, Pg. 177]

=> P_o = a C P_6 = 1.109 x 1 x 0.67 = 0.74 inch

If P_o is for 2 hour storm, i = P_o / 2 [WEF, Pg. 192]

=> i = 0.74 / 2 = 0.37 in./hr.

Frequency of this storm event is 3 months [BOE, Fig. G212A]

Average slope of the flow line = 1 %

=> Velocity, V = 0.7 ft/sec for grass [Gupta, Fig. 12.7, Pg. 625]

Travel distance for runoff, L = 500 ft + 480 ft = 980 ft. [Project site plan]

Time of concentration for runoff, t_c = L / V [Gupta, Pg. 623]
=> t_c = 980 / 0.7 = 1400 sec = 23.3 minutes

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For this t_c and 3-month frequent storm
=> Rainfall intensity, i = 0.95 in/hr [BOE, Fig. G212A]

Runoff discharge rate for this rainfall,
$Q = C\,i\,A_p$; Where, C = runoff coeff.= 0.9086 [LAMC, Code 3800]

⇨ $Q = 0.9086 \times 0.95 \times 2.52 = 2.18$ cfs

Discharge this runoff over three (3) identical swale with the following assumed characteristics: [WEF, Pg. 192]

Type: Trapezoidal
Center depth, D = 6" = 0.5 ft
Vegetation: Grass
Grass height = 4"
Longitudinal slope, S = 4%
Side slope ratio, Z = 6
Bottom width, B = 3 ft
Manning's n = 0.22
Runoff discharge, Q = 2.18 / 3 = 0.73 cfs

=> Flow depth in swale, Y = Grass ht. – 2" = 4" – 2" = 2" = 0.167 ft

Because B >> Y, hydraulic radius, R = Y [WEF, Pg. 194]

Using Manning's equation for flow velocity, $V = (1.486 / n) \times R^{2/3} \times S^{1/2}$

$V = (1.486 / 0.22) \times 0.167^{2/3} \times 0.04^{1/2}$
$= 0.41$ ft/sec < 0.9 sec OK [WEF, Pg. 192]

=> Runoff flow area = Q / V = 0.73 / 0.41 = 1.78 ft^2

Cross section area of swale $= BD + ZD^2$
$= (3 \times 0.5) + (6 \times 0.5^2)$
$= 3.0$ > Runoff flow area OK

For a 225 ft. long swale,

=> Hydraulic retention in swale, t_d = Length / Velocity

=> $t_d = 225 / 0.41 = 550$ sec
$= 9.1$ min > Minimum of 9 min. suggested for Pacific Northwest *(Note: local data can be used if available)*

=> Top width of swale, $T = B + 2DZ = 3 + 2\,(0.5 \times 6) = 9$ ft.

➔ Three swales (225' L x 9' W x 6" D) required.

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(ii) For Rooftop Runoff – INFILTRATION TRENCH
[Using WEF Manual of Practice #23]

Size of the building roof, A_r = 130,000 ft^2 = 2.98 acres
Runoff coefficient, C = 0.9086 [LAMC, Code 3300]

Requisite site conditions: [WEF, Pg. 206]

- High groundwater must be > 4 ft. below bottom of infiltration trenches
- Bedrock must be > 4 ft. below bottom of the trenches
- No fill or recompacted soil in and around the trenches
- Soil around the trenches must be of HSG Group A or B

Assumptions:

- Sandy soil on site
- Hydraulic conductivity, k = 3.3×10^{-3} ft/sec [WEF, Table 5.11, Pg. 205]
- Trench is filled with mix of uniform and graded gravel
- Porosity of trench fill, p = 35% [WEF, Table 5.12, Pg. 206]
- Width of trench, W = 3 ft [WEF, Pg. 206]

"Maximized" storm volume calculated in Vegetative Swale section,
P_o = 0.74 in. [WEF, Pg. 209]

⇨ Volume to runoff to drain into infiltration trench,
$V_r = P_o A = (0.74 / 12) \times 130{,}000 = 8017$ ft3

=> Volume of the required trench with gravel
$V_T = V_r / p = 8017 / 0.35 = 22{,}905\ ft^3$

Total area of the sides of the trenches, $A_T = 2 V_T / k t$ [WEF, Eq. 5.7, Pg. 209]

If all captured runoff (V_r) is to drain out of trench in one day,
t = 24 hours = 86,400 sec [WEF, Pg. 207]

=> $A_T = 2 \times 22{,}905 / (3.3 \times 10^{-3} \times 86{,}400) = 160.6\ ft^2$

➔ Required trench will be 3'W x 6'D x 27' L.

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OPTION 3: CATCHBASIN INSERTS

To treat the "maximized" storage volume calculated for detention basin (Option 1) in 24 hours,

⇨ Outflow rate = 15,815 ft^3 / 24 hours = 82 gpm

Commercially available inserts:

➔ a. Aquashield Model 300, capacity 855 gpm [Aquashield]

➔ b. Fossil Filter, 2' x 2' Rectangular, capacity 76 gpm [Fossil Filter]

Each of these will require a catchbasin to collect runoff and drainage pipings for outflow from the inserts.

References

Aquashield, Remedial Solutions, Inc., 1999

BOE, *Storm Drain Design*, City of Los Angeles, Department of Public Works, 1973.

Fossil Filter, Kristar Enterprise, 1996

Gupta, Ram, *Hydrology and Hydraulic Systems*, Waveland Press, Inc. 1995.

Industrial Handbook, *California Stormwater Best Management Practice Handbooks*, Stormwater Quality Taskforce, 1993.

LAMC, *Stormwater Pollution Abatement Charge,* Los Angeles Municipal Code 64.51.

WEF, *Urban Runoff Quality Management*, WEF Manual of Practice No. 23, Joint Task of the WEF and ASCE, 1998.

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DRAFT

BMP COST

Option 1: DETENTION BASIN

DETENTION BASIN (Unlined)

i. Excavation and haulaway - \$22 / yd^3 [1]

⇨ Warehouse project: 15815 ft^3 = 585 yd^3 = \$12,870

ii. Land cost - \$18 / sq.ft. [2]

⇨ Warehouse project: 40'x40' = 1600 sq.ft. = \$28,800

iii. Maintenance cost: 1 cleanout per year

Event Mean Concentration for Commercial Area – 91 mg/L TSS [3]

=> Total rainfall volume captured in the basin = 70% of 15 in. per year
= (10.5 in/12) x 240,000
= 210,000 ft^3 = 5,943,000L

⇨ TSS collected = 80% (91 mg/L x 5,943,000 L) = 432.6 kg / yr.

If sediment density is 1.5 tons/ yd^3, total TSS to be removed = 0.29 yd^3

Clean-out cost: 1 cu.yd / 3 years = \$99 / 3 yrs. = \$33/year.

➔ Total capital cost - \$28,800
➔ Annual maintenance - \$ 33

Option 2: INFILTRATION TRENCH & VEGETATED SWALE

a. INFILTRATION TRENCH – For roof runoff

i. Infiltration trench with gravel ≈ \$27.77 per ft^3 [4]

⇨ Warehouse project: 3' W x 6' D x 27'L = \$13,500

ii. Land cost: Negligible

iii. Maintenance cost: Replacement of gravel every 5 years.
≈ ½ of initial set up = \$6750 every 5 years

⇨ Annual maintenance cost = \$1,350

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b. VEGETATED SWALE – For parking lot runoff

9 ft wide swale = $6 per linear foot [5]

⇨ Warehouse project: 3 (9' W x 225' L) = 3 x ($6 x 225) = $4050

Land cost: No extra land required – Swale to be incorporated in landscaping plan.

Maintenance cost: Routine landscape upkeep will do - No additional mowing and cleaning.

➔ Total capital cost - $17,550
➔ Annual maintenance cost - $1,350

Option 3:

CATCHBASIN INSERTS – For the entire project

To treat the "maximized" storage volume calculated for detention basin in 24 hours, outflow = 15,815 ft^3 / 24 hours = 82 gpm

Aquashield Model 300, capacity 855 gpm = $1335 [6]
Fossil Filter, 2' x 2' Rectangular, capacity 76 gpm = $1,000 [6]

⇨ Warehouse project ≈ $1200

ii. Land cost: Negligible

iii. Storm drain connection cost ≈ $300

iv. Maintenance and disposal cost: 3 cleanings and 3 replacement = $495 / yr. [7]

➔ Total capital cost - $1,500
➔ Annual maintenance cost - $495

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Cost Bases

1. Earthwork estimate – Bureau of Engineering, City of Los Angeles

2. Real Estate Estimator – Department of General Services, City of Los Angeles.
   Estimate varies from $15 to $25 in S. Central L.A.

3. Watershed Model, US EPA 1983

4. Infiltration trench in DOT Parking Lot in Venice by City of Los Angeles
   Cost for 5'W x 3'D x 12'L trench = $5,000

5. Bird Rehab Center in San Pedro by Trees People for City of Los Angeles
   Cost for 6 ft wide swale = $4 per linear foot.

6. BMP Demonstration projects by City of Los Angeles

7. Rick Campos – DPS Kristar Enterprise, Cotati, CA
   Schedule A: Maintenance and disposal cost for 3 cleanings and one replacement = $200 per year.
   Schedule B: 3 cleanings and 2 replacement = $275
   ≈ $45/cleaning and $75/replacement

STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

SAMPLE CALCULATIONS

Sample calculations for a commercial development project using the numerical mitigation measure under consideration by the Regional Water Quality Control Board were performed with the assistance of City of Los Angeles staff. The case examples illustrate that, (i) the three different numerical mitigation criteria for calculating Best Management Practice (BMP) sizing dimensions produce values that are within 10 percent of one another; (ii) the sizing criteria for treatment BMPs (vegetated swales and infiltration trench) based on filtration and adsorption (not storage) are reasonable and practicable using the numerical mitigation criteria being considered by the Regional Board; and (iii) commercially available catch-basin inserts are adequately manufactured to handle and treat flow equivalent to the storage volume that is needed for a detention basin BMP.

REQUIREMENT: 85th percentile rainfall runoff capture

PROJECT: Light industrial warehouse/office with parking lot in South Central L.A.

PROJECT SIZE: 240,000 ft^2 = 5.51 acres

CASE EXAMPLE 1: DETENTION BASIN: Sample calculation demonstrates the water quality treatment volume required to size a detention basin using (a) the maximized water quality treatment volume method and (b) the 85th percentile rainfall event treatment volume for Los Angeles County and (c) the 85 percent annual runoff volume capture method.

(a) WEF Manual of Practice #23 – Chapter 5

Maximized detention volume, $P_o = a\ C\ P_6$ [WEF, Pg. 175]

For 85th percentile event capture for 24 hours

Regression constant, a = 1.299 [WEF, Table 5.4, Pg. 177]
Mean storm depth, P_6 = 0.67 in. [WEF, Figure 5.3, Pg. 176]

(Note: Local precipitation record can be used to calculate more accurate P_6 for the site)

C = 0.9086 [LAMC, Code 3300]

=> P_o = 1.299 x 0.9086 x 0.67 = 0.7908 inch

Required storage volume = P_o x Area of the site
= (0.7908 in / 12) x 240,000 ft^2
= 15,815 ft^3 = 118,296 gal.

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➔ Basin size ≈ 40'W x 40'L x 10' D

(b) Using treatment volume from all events up to and including 0.75" rainfall

P_o = 0.75 in.

⇨ Required storage volume = (0.75 in / 12) x 240,000 ft^2
= 15,000 ft^3 = 112,200 gal.

➔ Basin size = 40'W x 40'L x 9.5'D

(c) California Stormwater BMP Handbook

For 85 percent annual runoff volume capture for 40 hours [Industrial Handbook, Pg. D1]

⇨ Unit basin storage volume = 0.06 ac-ft/ac [Industrial Handbook, Pg. D7]

⇨ Required storage volume = Unit basin storage x Area of site
= 0.06 ac-ft/ac x 5.51 ac
= 0.3306 ac-ft
= 14,401 ft^3 = 107,719 gal.

➔Basin size = 40'W x 40'L x 9'

CASE EXAMPLE 2: VEGETATED SWALE AND INFILTRATION TRENCH: These calculations demonstrate sizing of alternative BMPs to achieve storm water treatment without storage capture as would be required with the detention basin BMP illustrated in case example 1. The method used is the maximized water quality treatment approach.

(i) VEGETATED SWALE – For Parking Lot Runoff
[Using WEF Manual of Practice #23]

Area of the parking lot, A_p = 110,000 ft^2 = 2.525 ac.

Mean storm, P_6 = 0.67 in. [WEF, Fig. 5.3, Pg. 176]

Runoff coefficient, C = 1 [WEF, Pg. 191]

Drain time = 12 hours [WEF, Pg. 191]

Regression constant, a = 1.109 [WEF, Table 5.4, Pg. 177]

=> P_o = a C P_6 = 1.109 x 1 x 0.67 = 0.74 inch

If P_o is for 2 hour storm, $i = P_o / 2$ [WEF, Pg. 192]

=> i = 0.74 / 2 = 0.37 in./hr.

Frequency of this storm event is 3 months [BOE, Fig. G212A]

Average slope of the flow line = 1 %

=> Velocity, V = 0.7 ft/sec for grass [Gupta, Fig. 12.7, Pg. 625]

Travel distance for runoff, L = 500 ft + 480 ft = 980 ft. [Project site plan]

Time of concentration for runoff, t_c = L / V [Gupta, Pg. 623]
=> t_c = 980 / 0.7 = 1400 sec = 23.3 minutes

For this t_c and 3-month frequent storm
=> Rainfall intensity, i = 0.95 in/hr [BOE, Fig. G212A]

Runoff discharge rate for this rainfall,
$Q = C\, i\, A_p$, Where, C = runoff coeff.= 0.9086 [LAMC, Code 3800]

⇨ $Q = 0.9086 \times 0.95 \times 2.52 = 2.18$ cfs

Discharge this runoff over three (3) identical swale with the following assumed characteristics: [WEF, Pg. 192]

Type: Trapezoidal
Center depth, D = 6" = 0.5 ft
Vegetation: Grass
Grass height = 4"
Longitudinal slope, S = 4%
Side slope ratio, Z = 6
Bottom width, B = 3 ft
Manning's n = 0.22
Runoff discharge, Q = 2.18 / 3 = 0.73 cfs

=> Flow depth in swale, Y = Grass ht. – 2" = 4" – 2" = 2" = 0.167 ft

Because B >> Y, hydraulic radius, R = Y [WEF, Pg. 194]

Using Manning's equation for flow velocity, V $= (1.486 / n) \times R^{2/3} \times S^{1/2}$

$V = (1.486 / 0.22) \times 0.167^{2/3} \times 0.04^{1/2}$
$= 0.41$ ft/sec < 0.9 sec <u>OK</u> [WEF, Pg. 192]

=> Runoff flow area = Q / V = 0.73 / 0.41 = 1.78 ft^2

Cross section area of swale = $BD + ZD^2$
$= (3 \times 0.5) + (6 \times 0.5^2)$
= 3.0 > Runoff flow area <u>OK</u>

For a 225 ft. long swale,

=> Hydraulic retention in swale, t_d = Length / Velocity

=> t_d = 225 / 0.41 = 550 sec
= 9.1 min > Minimum of 9 min. suggested for Pacific Northwest *(Note: local data can be used if available)*
=> Top width of swale, T = B + 2DZ = 3 + 2 (0.5 x 6) = 9 ft.

➔ Three swales (225' L x 9' W x 6" D) required.

(ii) For Rooftop Runoff – INFILTRATION TRENCH
[Using WEF Manual of Practice #23]

Size of the building roof, A_r = 130,000 ft^2 = 2.98 acres
Runoff coefficient, C = 0.9086 [LAMC, Code 3300]

Requisite site conditions: [WEF, Pg. 206]

- High groundwater must be > 4 ft. below bottom of infiltration trenches
- Bedrock must be > 4 ft. below bottom of the trenches
- No fill or recompacted soil in and around the trenches
- Soil around the trenches must be of HSG Group A or B

Assumptions:

- Sandy soil on site
- Hydraulic conductivity, k = $3.3x10^{-3}$ ft/sec [WEF, Table 5.11, Pg. 205]
- Trench is filled with mix of uniform and graded gravel
- Porosity of trench fill, p = 35% [WEF, Table 5.12, Pg. 206]
- Width of trench, W = 3 ft [WEF, Pg. 206]

"Maximized" storm volume calculated in Vegetative Swale section,
P_o = 0.74 in. [WEF, Pg. 209]

⇨ Volume to runoff to drain into infiltration trench,
$V_r = P_o A$ = (0.74 / 12) x 130,000 = 8017 ft3

=> Volume of the required trench with gravel
$V_T = V_r / p$ = 8017 / 0.35 = 22,905 ft^3

Total area of the sides of the trenches, $A_T = 2 V_T / k t$ [WEF, Eq. 5.7, Pg. 209]

If all captured runoff (V_r) is to drain out of trench in one day,
t = 24 hours = 86,400 sec [WEF, Pg. 207]

=> A_T = 2 x 22,905 / ($3.3x10^{-3}$ x 86,400) = 160.6 ft^2

➔ Required trench will be 3'W x 6'D x 27' L.

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CASE EXAMPLE 3: CATCHBASIN INSERTS: This calculation demonstrates that commercially available catch-basin inserts are adequately designed for flow treatment equivalent to the storage volume required in case example 1, based on manufacturers product performance claims.

To treat the "maximized" treatment volume calculated for detention basin (case example 1) in 24 hours,

⇨ Outflow rate = 15,815 ft^3 / 24 hours = 82 gpm

Commercially available inserts:

➔ a. Aquashield Model 300, capacity 855 gpm [Aquashield]

➔ b. Fossil Filter, 2' x 2' Rectangular, capacity 76 gpm [Fossil Filter]

Each of these will require a catch basin to collect runoff and drainage pipings for outflow from the inserts.

References

Aquashield, Remedial Solutions, Inc., 1999

Bureau of Engineering (BOE), *Storm Drain Design*, City of Los Angeles, Department of Public Works, 1973.

Fossil Filter, Kristar Enterprise, 1996

Gupta, Ram, *Hydrology and Hydraulic Systems*, Waveland Press, Inc. 1995.

Industrial Handbook, *California Stormwater Best Management Practice Handbooks*, Stormwater Quality Taskforce, 1993.

Los Angeles Municipal Code (LAMC), *Stormwater Pollution Abatement Charge*, Los Angeles Municipal Code 64.51.

Water Environment Federation (WEF), *Urban Runoff Quality Management*, WEF Manual of Practice No. 23, Joint Task of the WEF and ASCE, 1998.

STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

BMP COST ESTIMATES

Cost estimates for BMPs for a commercial development project using the numerical mitigation measure under consideration by the Regional Water Quality Control Board were performed with assistance of the City of Los Angeles staff. The cost estimates indicate that the capital and maintenance costs associated with treatment BMPs sized to meet the numerical mitigation measure are reasonable and amount to less than 0.5 percent of the project cost. The total cost of the project was estimated to be $ 6.5 million and includes the land acquisition, engineering and design, any clean-ups, construction, permits, etc.

CASE EXAMPLE 1: DETENTION BASIN

DETENTION BASIN (Unlined)

i. Excavation and haulaway - $22 / yd^3 [1]

⇨ Warehouse project: 15815 ft^3 = 585 yd^3 = $12,870

ii. Land cost - $18 / sq.ft. [2]

⇨ Warehouse project: 40'x40' = 1600 sq.ft. = $28,800

iii. Maintenance cost: 1 cleanout per year

Event Mean Concentration for Commercial Area – 91 mg/L TSS [3]

=> Total rainfall volume captured in the basin = 70% of 15 in. per year
= (10.5 in/12) x 240,000
= 210,000 ft^3 = 5,943,000L

⇨ TSS collected = 80% (91 mg/L x 5,943,000 L) = 432.6 kg / yr.

If sediment density is 1.5 tons/ yd^3, total TSS to be removed = 0.29 yd^3

Clean-out cost: 1 cu.yd / 3 years = $99 / 3 yrs. = $33/year.

➔ Total capital cost - $28,800
➔ Annual maintenance - $ 33

CASE EXAMPLE 2: INFILTRATION TRENCH & VEGETATED SWALE

a. INFILTRATION TRENCH – For roof runoff

i. Infiltration trench with gravel ≈ \$27.77 per ft^3 [4]

⇨ Warehouse project: 3' W x 6' D x 27'L = \$13,500

ii. Land cost: Negligible

iii. Maintenance cost: Replacement of gravel every 5 years.
≈ ½ of initial set up = \$6750 every 5 years

⇨ Annual maintenance cost = \$1,350

b. VEGETATED SWALE – For parking lot runoff

9 ft wide swale = \$6 per linear foot [5]

⇨ Warehouse project: 3 (9' W x 225' L) = 3 x (\$6 x 225) = \$4050

Land cost: No extra land required – Swale to be incorporated in landscaping plan.

Maintenance cost: Routine landscape upkeep will do - No additional mowing and cleaning.

➔ Total capital cost - \$17,550
➔ Annual maintenance cost - \$1,350

CASE EXAMPLE 3:

CATCHBASIN INSERTS – For the entire project

To treat the "maximized" storage volume calculated for detention basin in 24 hours, outflow = 15,815 ft^3 / 24 hours = 82 gpm

Aquashield Model 300, capacity 855 gpm = \$1335 [6]
Fossil Filter, 2' x 2' Rectangular, capacity 76 gpm = \$1,000 [6]

⇨ Warehouse project ≈ \$1200

ii. Land cost: Negligible

iii. Storm drain connection cost ≈ \$300

iv. Maintenance and disposal cost: 3 cleanings and 3 replacement

= $495 / yr. [7]

➔ Total capital cost - $1,500
➔ Annual maintenance cost - $495

Reference for Costs

1. Earthwork estimate – Bureau of Engineering, City of Los Angeles

2. Real Estate Estimator – Department of General Services, City of Los Angeles. Estimate varies from $15 to $25 in S. Central Los Angeles.

3. Watershed Model, US Environmental Protection Agency. 1983

4. Infiltration trench in Department of Transportation Parking Lot. Venice, Los Angeles
   Cost for 5'W x 3'D x 12'L trench = $5,000

5. Bird Rehab Center in San Pedro.y Trees People for City of Los Angeles
   Cost for 6 ft wide swale = $4 per linear foot.

6. BMP Demonstration projects by City of Los Angeles

7. Rick Campos – DPS Kristar Enterprise, Cotati, CA
   Schedule A: Maintenance and disposal cost for 3 cleanings and one replacement = $200 per year.
   Schedule B: 3 cleanings and 2 replacement = $275
   ≈ $45/cleaning and $75/replacement

STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

TWENTY-FOUR HOUR RAINFALL OCCURRENCE PROBABILITY

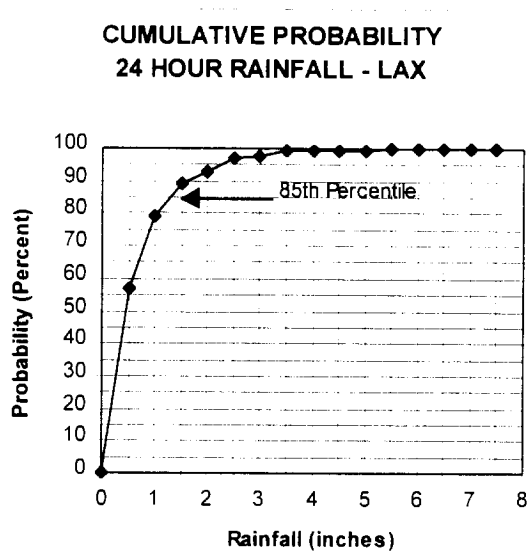
Table 1. Summary of 24-hour rainfall total depth historical record for the Civic Center station (100-year record) and the LAX station (50-year record). (Data provided by Los Angeles County Department of Public Works)

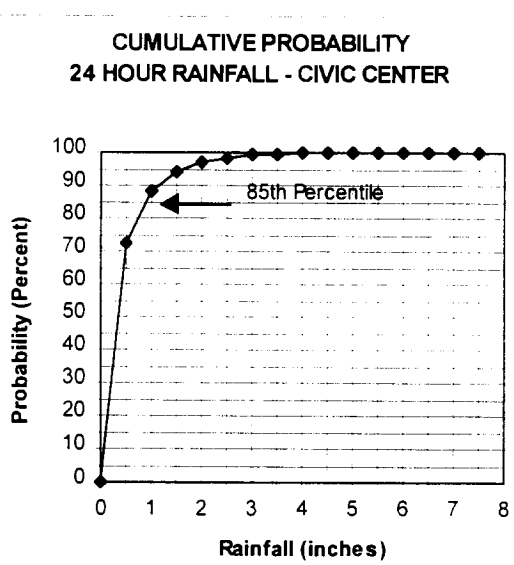
Total Volume (in) Range	No. of storms LAX	Cumulative	Cumulative Percent	No. of storms Civic Center	Cumulative	Cumulative Percent
0	0	0	0	0	0	0
0.0 and 0.5	508	508	56.6	3330	3330	72.6
0.5 and 1.0	203	711	79.3	706	4036	88.0
1.0 and 1.5	88	799	89.1	276	4312	94.0
1.5 and 2.0	36	835	93.1	141	4453	97.1
2.0 and 2.5	25	870	97.0	60	4513	98.4
2.5 and 3.0	8	878	97.9	36	4549	99.1
3.0 and 3.5	12	890	99.2	12	4561	99.4
3.5 and 4.0	1	891	99.3	14	4575	99.7
4.0 and 4.5	1	892	99.4	7	4582	99.9
4.5 and 5.0	1	893	99.6	3	4585	99.9
5.0 and 5.5	2	895	99.8	1	4586	100.0
5.5 and 6.0	0	895	99.8	2	4588	100.0
6.0 and 6.5	1	896	99.9	0	4588	100.0
6.5 and 7.0	0	896	99.9	0	4588	100.0
7.0 and 7.5	1	897	100.0	0	4588	100.0

STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

TWENTY-FOUR HOUR RAINFALL OCCURRENCE PROBABILITY





Graphs. Twenty-four hour total rainfall occurrence probability for the Civic Center station (representing all Los Angeles County) and the LAX station (representing coastal Los Angeles County). The arrow indicates 85th percentile value, which translates to 0.75 inch for countywide criterion, and about 1.4 inches for the coastal Los Angeles County.

VEGETATED SWALES AND FILTER STRIPS

Biofilters consist primarily of vegetated swales and filter strips. Swales are shallow channels with flow depths often below the height of the vegetation that grows within them. Filter strips are vegetated flat surfaces over which water flows in a thin sheet. Planted vegetation can be turf grasses, emergent wetland, or high marsh plants. Some infiltration occurs through the underlying soil cover, but that is not the primary mode of treatment. Suspended solids are removed by filtering through the vegetation and settling. Dissolved constituents may also be removed through chemical or biological mechanisms mediated by the vegetation and the soil.

PLANNING CRITERIA AND GUIDELINES. Local governments and stormwater professionals should view biofilters as an element of the stormwater management infrastructure and as a part of the treatment train. For example, roadside ditches can be designed as biofilters and as landscaping amenities. Also, when land is limited, surrounding a pond with a biofilter will treat low flows before they enter the pond. Consider retrofitting biofilters in developed areas.

Effective biofiltration depends on proper design, construction, and maintenance. Also, local jurisdictions need to provide for access easements on private land for their inspection, monitoring, and maintenance, and they need to enforce long-term maintenance commitments by private parties to the control facilities owned by private parties.

Every effort should be made to prevent sediment-laden construction runoff, oil, and grease from entering biofilters. Catch basins, detention basins, presettling devices, and oil–water separators can be installed upstream of biofilters to help remove these materials before they reach the biofilter. Any of these devices or controls can improve the performance and the life of a biofilter.

DESIGN AND INSTALLATION CRITERIA AND GUIDELINES. Provisions Applying Equally to Swales and Filter Strips. It is important to maximize water contact with the biofilter vegetation and the soil surface. Graveled and coarse sandy soils are not desirable because they have difficulty sustaining vegetation. Heavy clay soils, materials toxic to vegetation, stones, and debris should also be avoided. When suitable, use on-site materials and scarify and till compacted soils before planting.

Vegetate biofilters uniformly with fine, turf-forming, water-resistant grasses. In arid and semiarid areas, supplemental irrigation will be needed to maintain healthy filter strips. Where biofilters intercept groundwater or where there is little slope for proper drainage, emergent herbaceous wetland

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vegetation is an acceptable planting alternative. Whenever possible, use vegetation native to the region. It is important to select grass and wetland species that work best for the region, climate, and native soils. Do not assume that information from other regions can be used at every site. Also, if wildlife habitat is being provided, select vegetation accordingly.

Use grass seed and mulch application rates specified by the supplier. If at all possible, do not use animal manure as an amendment and avoid using fertilizers. If fertilizer must be used, apply only the amount needed by the selected plants in the existing soil conditions and use a slow-release fertilizer. Establish grasses when natural moisture is adequate but irrigate if necessary. If wetland plants are used, they may need to be protected from predation with netting during establishment. If possible, divert runoff, other than necessary irrigation, during the period of vegetation establishment.

Vegetate upslope areas to prevent erosion. Use barrier shrubs to reduce intrusion by people and domestic animals. Avoid trees that shade biofilter grasses, and if trees cannot be avoided, space them at least 6.5 m (20 ft) apart. Landscape beds near biofilters should be at a slightly lower elevation than the adjacent ground surface.

Provide for a 1.0 to 2.0% slope in the direction of flow, with 6.0% being the maximum and 0.5% being the minimum. When the longitudinal slope is less than 1.0 to 2.0%, install a perforated underdrain or, if moisture is adequate, establish wetland species. If the slope is greater than 2.0%, use check dams to reduce the effective slope to approximately 2.0%. Install energy dissipating riprap at the toe and for a short distance downstream at the toe of these check dams to control erosion. When the land slopes more than 6%, swales can be installed to traverse the grade at a lesser slope. Grade biofilters carefully to attain uniform longitudinal and lateral slopes and eliminate high and low spots.

If curb cuts are used to distribute the flow over a biofilter, they should be at least 0.3 m (12 in.) wide to reduce clogging. Place the pavement slightly above the adjacent biofilter elevation. Install a flow-spreading device with sediment cleanouts (such as weirs, stilling basins, and perforated pipes) to uniformly distribute flow at an inlet to a swale or across the width of a filter strip. Protect inlet areas from erosion by using stilling basins and riprap pads with rock sized large enough not to be moved by the inflow.

A high-flow bypass is not needed if the biofilter is preceded by a runoff quantity control device designed to release flow at rates that will not cause erosion or scour within the biofilter. When a bypass is used, provide it with an inflow regulating device and use a pipe or a stabilized channel to convey the flow.

Provisions for Swales. At minimum, design for the peak runoff rate during the "maximized" storm. Base this storm depth on the rainfall depth using a runoff coefficient $C = 1.0$ (that is, complete runoff, no infiltration) and a 12-hour "drain time." Relate this "maximized" depth to an approximate inten-

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sity-duration curve for the area that can then be used with the rational formula by assuming the storm occurs over 1 or 2 hours. Using the time of concentration for the catchment and its runoff coefficient C, find the design flow rate. Unless larger events will bypass the swale, enlarge its capacity for flood passage of the 10- to 100-year peak flow.

The following criteria are probably most applicable in warm and temperate, non-semi-arid climates and should be met or exceeded during the biofiltration capacity design event:

- "Maximized" runoff hydraulic residence time of 5 minutes or more;
- Maximum flow velocity less than 0.3 m/s (0.9 ft/sec);
- Manning's $n = 0.20$ for routinely mowed swales;
- Manning's $n = 0.24$ for infrequently mowed swales;
- Maximum bottom width of 2.4 m (8 ft);
- Minimum bottom width of approximately 0.6 m (2 ft);
- Maximum depth of flow no greater than one-third of the gross or emergent wetland vegetation height for infrequently moved swales or greater than one-half of the vegetation height for regularly mowed swales, up to a maximum of approximately 75 mm (3 in.) for grass and approximately 50 mm (2 in.) below the normal height of the shortest wetland plant species in the biofilter; and
- Minimum length of 30 m (100 ft).

Use a trapezoidal cross section for ease of construction with side slopes no steeper than 4:1 for ease of maintenance. Terracing needs to be used when side slopes become steeper than 3:1.

Provisions for Filter Strips. Design filter strips to carry the "maximized" storm peak runoff rate described in the section titled Provisions for Swales. Base the flow capacity design to meet or exceed the following criteria during the design storm event. The following specifications may be used:

- Hydraulic retention time of no fewer than 5 minutes;
- Average velocity not greater than 0.3 m/s (0.9 ft/sec);
- Manning's $n = 0.20$ for routinely mowed strips;
- Manning's $n = 0.24$ for infrequently mowed strips;
- Limit filter strip width to achieve uniform flow distribution;
- Average depth of flow no more than 25 mm (1.0 in.); and
- Hydraulic radius taken to be equal to the design flow depth.

In arid and semiarid areas, biofilter strips will need irrigation to maintain a dependable grass cover.

OPERATION AND MAINTENANCE OF BIOFILTERS. To keep biofilters operating properly, keep all inlet flow spreaders even and free of debris. Remove debris for aesthetic reasons. Mow grass-covered biofilters

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regularly during the growing season to promote growth and pollutant uptake. Remove cuttings and dispose of them properly or through composting. If the objective is to prevent nutrient transport, mow grasses or cut emergent wetland plants to a low height, but still above the maximum flow depth, at the end of the growing season. For trapping floatables and debris pollution control objectives, let the plants stand at a height exceeding the design water depth by at least 50 mm (2 in.) at the end of the growing season.

Remove sediment by hand with a flat-bottomed shovel during the summer months whenever sediment covers vegetation or begins to reduce the biofilter's capacity. Reseed damaged or recently maintained areas immediately with a mix used for initial establishment or use grass plugs from adjacent upslope areas. If possible, redirect flow until new grass is firmly established. Otherwise, cover the seeded areas with a high-quality erosion control fabric.

Inspect biofilters periodically, preferably monthly, especially after heavy runoff. Maintain clean curb cuts to avoid soil and vegetation buildup. Educate local residents about the importance of keeping biofilters free of lawn debris and pet waste. Base roadside ditch cleaning on hydraulic analysis. Remove only the amount of sediment necessary to restore needed hydraulic capacity, leaving as much of the vegetation in place as possible. Eventually, sufficient sediment will be trapped that the entire biofilter will need to be removed with the sediment and reconstructed to begin a new cycle of stormwater quality control.

BIOFILTER DESIGN PROCEDURE. Preliminary Steps. The design procedures for swales and filter strips are almost identical. The design steps described below are for swales, with notes provided for filter strip design when appropriate:

- P1: estimate runoff flow rate for the design event and limit the discharge to approximately 0.03 m^3/s (1.0 cu ft/sec) by dividing the flow among several swales, installing upstream detention to control release rates, or reducing the developed surface area to reduce runoff coefficient and gain space for biofiltration.
- P2: establish the slope of the proposed biofilter.
- P3: select a vegetation cover suitable for the site.

Design for Biofiltration Capacity. This analysis emphasizes biofiltration rather than efficient hydraulic conveyance, thereby promoting sedimentation, filtration, and other pollutant removal mechanisms. Typically, a lower maximum velocity is arrived at than required for slope stability, and the biofilter dimensions typically do not have to be modified after a check for stability.

- D1: estimate the height of vegetation that is expected to occur during the storm runoff season. The design flow depth should be at least 50 mm (2.0 in.) less than this vegetation height and a maximum of approximately 75 mm (3.0 in.) in swales and 25 mm (1.0 in.) in filter strips.

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- D2: select Manning's n as discussed.
- D3: typically swales are designed as trapezoidal channels (skip this step in filter strip design). When using a rectangular section, provide reinforced vertical walls. See Figure 5.5 for relationships for estimating cross-sectional area, top width, and hydraulic radius for typical channel geometrics.

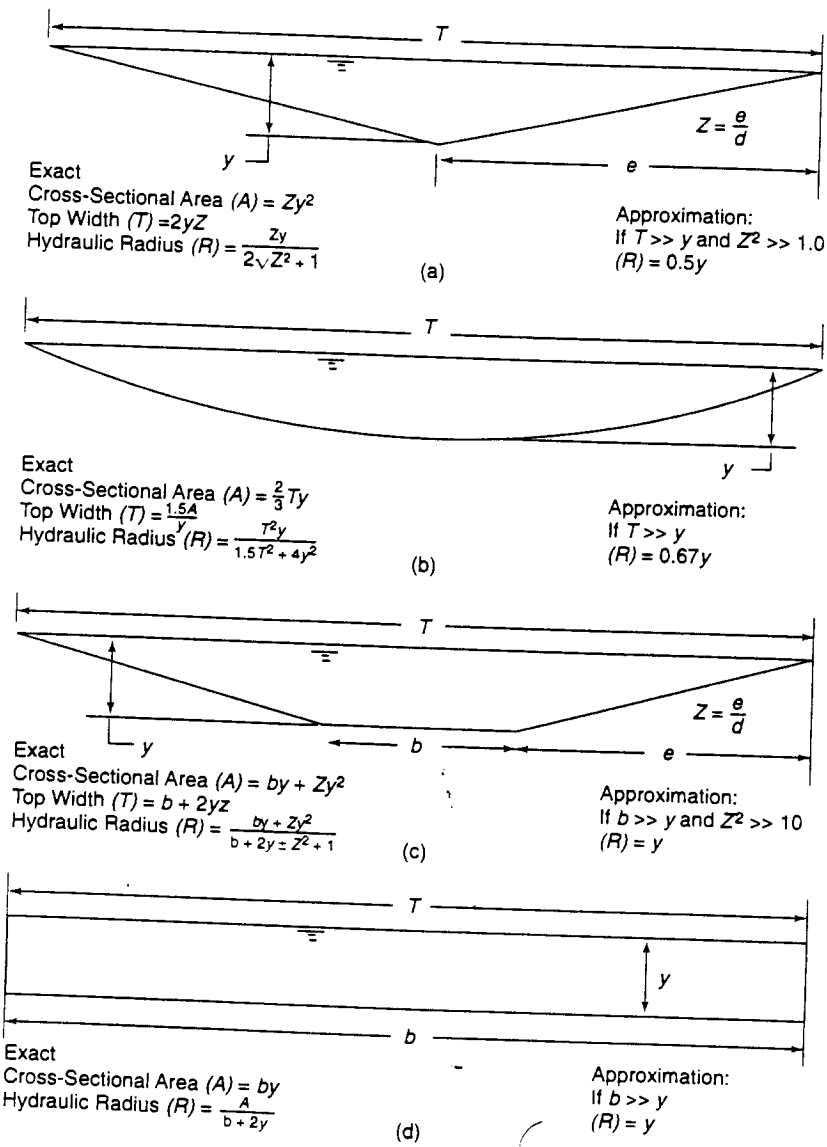

Figure 5.5 **Geometric formulas for common swale shapes: (a) v-shape, (b) parabolic shape, (c) trapezoidal shape, and (d) rectangular shape.**

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- D4: use Manning's equation to approximate initial dimensions. For trapezoidal shape, select a side slope that is no steeper than 3:1, with 4:1 or flatter preferred. Set the bottom width to be between approximately 0.6 and 2.5 m (2.0 to 8.0 ft).
- D5: compute cross-sectional area.
- D6: compute the flow velocity for the design flow rate. Limit velocities during the "maximized" design storm to less than 0.3 m/s (0.9 ft/sec). Greater velocities were found to knock grasses from a vertical position in the Pacific Northwest (U.S.), reducing filtration. Experience in other regions may be different. Adjust for local experience. If the flow velocity exceeds the limit value, repeat steps P1 through D6.
- D7: compute the swale length using the design velocity from step D6 and an assumed hydraulic retention time. A suggested retention time value in the Pacific Northwest is 9 minutes. However, it is acceptable to use other accepted regional values, preferably no fewer than 5 minutes. If the computed swale length is less than 30 m (100 ft), increase to 30 m and adjust bottom width.

Check for Stability to Reduce Erosion. The "stability" check is performed for the combination of highest expected flow and least vegetation coverage and height.

- S1: unless runoff will bypass the biofilter, perform the "stability" check for the 10- to 100-year design storm. Estimate the design discharge as in step P1.
- S2: estimate the vegetation coverage (for example, "good" or "fair") and flow depth for conditions that will exist whenever the coverage and vegetation height are the least.
- S3: estimate the degree of retardance using Table 5.7. Because emergent wetland species typically grow less densely than grasses, assume a "fair" coverage.
- S4: establish the maximum permissible velocity (V_{max}) from Table 5.8 to prevent erosion.

Table 5.7 Guide for selecting degree of retardance.

Average grass height, in.[a]	Degree of vegetation coverage	
	"Good"	"Fair"
>30	A. (Very high)	B. (High)
11–24	B. (High)	C. (Moderate)
6–10	C. (Moderate)	D. (Low)
2–6	D. (Low)	D. (Low)
<2	E. (Very low)	E. (Very low)

[a] in. × 25.40 = mm.

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Limiting the ponding depth to 0.3 m (1 ft) establishes the basin's surface area at 308 m^3 (3 320 sq ft). The total exfiltration rate then is

$$Q_{out} = (3\,320 \times 1.0 \div 12) = 7.8\ m^3/h\ (277\ cu\ ft/hr)$$

This exfiltration rate will empty the design volume in 12 hours. Doubling the basin's surface area to 716 m^2 (6 640 sq ft) will empty the design volume in 6 hours at a rate of 15.7 m^3/h (554 cu ft/hr). Note that the resultant basin area occupies almost 3% of the total catchment area.

Next, check to see if the basin will handle prolonged snowmelt periods without overtopping. Using the snowmelt rates listed previously, we find the snowmelt rate for the site is 0.71 mm/h (0.028 in./hr), equal to a 15.8-m^3/h (55-cu ft/hr) runoff rate. This is virtually identical to the design rate of 15.7 m^3/h (554 cu ft/hr), and further adjustment to the basin's size is not justified.

PERCOLATION TRENCHES. Assessing a Site for Suitability. Darcy's law provides a basis for estimating the rate at which water can percolate into the ground through the sides of a percolation trench. It is expressed as Equation 5.4 and forms a basis for judging whether a site is suitable for the installation of a percolation trench:

$$U = k \cdot I \tag{5.4}$$

Where

U = flow velocity, m/s;
k = hydraulic conductivity, m/s; and
I = hydraulic gradient, m/m.

Because the bottom of the facility is above the high seasonal groundwater, assume the hydraulic gradient to be $I = 1.0$. Determine the hydraulic conductivity of the soils adjacent to the percolation trench. Table 5.11 lists ranges in hydraulic conductivity for a variety of typically found soil types. Note that conductivities can vary four orders of magnitude for a single soil group. It is best to perform several site-specific hydraulic conductivity tests and use the

Table 5.11 Hydraulic conductivity of five soil types.

Soil type	Hydraulic conductivity	
	ft/sec	m/s
Gravel	3.3×10^{-3}–3.3×10^{-1}	10^{-3}–10^{-1}
Sand[a]	3.3×10^{-5}–3.3×10^{-2}	10^{-5}–10^{-2}
Silt	3.3×10^{-9}–3.3×10^{-5}	10^{-9}–10^{-5}
Clay (saturated)	$< 3.3 \times 10^{-9}$	$< 10^{-9}$
Till	3.3×10^{-10}–3.3×10^{-6}	10^{-10}–10^{-6}

[a] Minimum acceptable hydraulic conductivity for stormwater percolation is 2.0×10^{-5} m/s (6.5×10^{-5} ft/sec).

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lowest field measured *in situ* hydraulic conductivities for final design purposes. Even under ideal conditions, soils adjacent to the trench will clog with time. A percolation trench is expensive to construct and more expensive to rebuild. Thus, being conservative in its design is appropriate.

The same factors, except for the use of soil hydraulic conductivity, affect site suitability for a percolation facility as affect a surface infiltration basin. Thus, if the following conditions are discovered or are likely to be at the site, disposal of stormwater by percolation is not recommended:

- Seasonal high groundwater is less than 1.2 m (4 ft) below the bottom of the percolation trench;
- Bedrock or impervious soils are within 1.2 m (4 ft) of the bottom of the percolation trench;
- The percolation trench is located within or on top of fill or recompacted soils; or
- The soils adjacent to the trench are RCS hydrologic group C or D or the field saturated hydraulic conductivity of the soils is less than 2.0×10^{-5} m/s (6.5×10^{-5} ft/sec).

If the above conditions do not rule out the site, the Swedish Association of Water and Wastewater Works (1983) provides design recommendations. This procedure is described by Urbonas and Stahre (1993).

Configuring a Percolation Trench. Percolation trench design uses the pore volume of trench fill media as the detention volume. Table 5.12 lists the porosity of the more typical trench fill materials. The bottoms of these trenches tend to clog first, often shortly after installation. As a result, the bottom of the trench is considered impervious and all water is assumed to percolate out only through its walls. Typically, long and deep trenches are most efficient and require the least amount of porous media. The maximum trench depth is limited by trench-wall stability, seasonal high groundwater levels, and the depth to any impervious soil layer. Trenches 1 m (3 ft) wide and 1 to 2 m (3 to 6 ft) deep seem to be most efficient.

If a percolation trench cannot be made sufficiently large to empty its fully available water storage volume (that is, granular media pore space volume)

Table 5.12 Porosity of commonly used granular materials.

Material	Effective porosity, %
Crushed and blasted rock	30
Uniform sized gravel	40
Graded gravel, 2.0 cm (0.75 in.)	30
Sand	25
Pit run gravel	15–25

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within a 24-hour period, it is recommended that a collector pipe be installed near its bottom and the stored water be released slowly through a flow controller (that is, choked outlet). The outlet is designed to supplement the percolation outflow so that both combine to empty out the trench-full volume in 24 hours. This type of installation behaves, in part, like a detention basin.

Most important for percolation trench longevity is to filter all the stormwater entering the trench through a sand layer. Percolation trenches should not be used without first filtering its inflow or if these filter systems will not be adequately maintained. If stormwater is permitted to enter the trench without first being filtered, pore media and adjacent soils will seal with time and the facility will fail.

Figure 5.8 illustrates a percolation trench with a surface sand filter layer

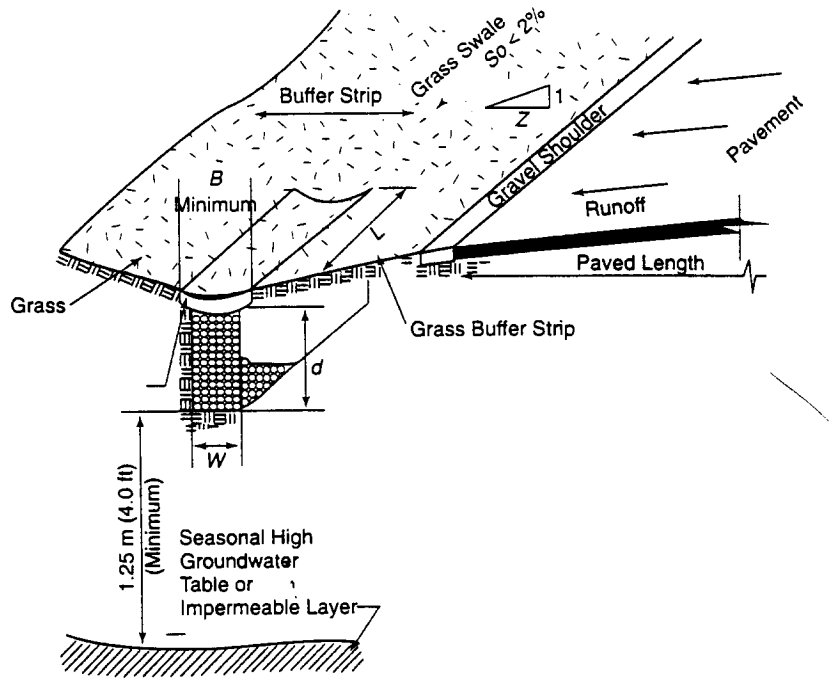

Figure 5.8 **A percolation trench with a sand filter layer for surface inflow (STORMWATER: BEST MANAGEMENT PRACTICES BY URBONAS/STAHRE, © 1993. Adapted by permission of Prentice-Hall, Inc., Upper Saddle River, N.J.). (Notes: Wrap all rock fill in geotextile fabric with coarse pores; buffer strip length > 25% paved length; length $L \leq K/(So/100)$ in which K = 0.3 m (1 ft) and So = slope, %; add trenches as needed to obtain required total length for infiltration; side slope $Z \geq 4.0$; sand or sand–turf filter layer surface area shall be sized to permit inflow to the trench with minimum of ponding; create ponding on sand–turf layer using a berm across the swale; $B > 2d$.)**

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on top. This sand filter layer has to have sufficient surface area to permit stormwater to enter the trench with minimal ponding above it. However, some ponding volume will be needed above the sand filter to buffer higher rates of runoff. Such a sand surface filter layer can be a modular porous pavement. Other filter configurations are possible, including inlets with geotextile filter bags within them (Urbonas and Stahre, 1993). All filter devices will need aggressive routine maintenance for acceptable operation.

Unlike the surface infiltration facilities, failure of a percolation trench can be unnoticed for long periods of time because the trench is out of sight. A routine inspection program is needed to discover failed percolation trenches. It is unlikely that someone will randomly observe and report a trench failure during storm periods. One or more observation wells should be provided to facilitate inspections. A record of water in the trench not draining within 2 days after a wet period ends can indicate incipient failure and should be investigated.

Sizing a Percolation Trench. Because a percolation trench is used to limit runoff from a small catchment, rational formula (Equation 5.5) may be used for its design:

$$Q = K_u \cdot C \cdot I_t \cdot A \tag{5.5}$$

Where

Q = average runoff rate for the storm duration t, m^3/s (cu ft/sec);
K_u = unit conversion factor, 1.0 for U.S. standard units (36 for the International System of Units);
C = runoff coefficient, nondimensional;
I_t = rainfall intensity for the design storm at the storm duration t, mm/h (in./hr); and
A = area of the tributary watershed, ha (ac).

Multiplying the average runoff rate, Q, by the design storm's duration, t, results in Equation 5.6, which gives the cumulative runoff volume over time t:

$$V_{in}(t) = K \cdot 3\,600 \cdot C \cdot \frac{I_t}{1\,000} \cdot t \cdot A \tag{5.6}$$

Where

$V_{in}(t)$ = total volume of *inflow* over storm duration t, m^3 (cu ft); and
t = storm duration, hour.

Because the water depth in the trench varies during storm runoff, the sides of a percolation trench are not fully inundated during the runoff event. To simplify the sizing process, the designer can assume that the average outflow rate is the result of one-half of the trench depth being inundated. This then allows the designer to find the average effective area of percolation. Also, assume the hydraulic gradient, I, equals 1.0. Thus, Equation 5.7 is derived from

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Darcy's law (that is, Equation 5.4):

$$V_{out}(t) = 3\,600 \cdot k \cdot (A_{perc} \div 2) \cdot t \qquad (5.7)$$

Where

$V_{out}(t)$ = total volume of water percolated into the ground over time t, m^3;
k = hydraulic conductivity of the soil, m/s (ft/sec);
A_{perc} = total area of the sides of the percolation trench, m^2 (sq ft);
t = duration of the percolation time, hour.

The maximum volume of water stored, V, in the trench is the difference between $V_{in}(t)$ and $V_{out}(t)$, as expressed by Equation 5.8:

$$V = \max [V_{in}(t) - V_{out}(t)] \qquad (5.8)$$

Thus, Equation 5.9 is derived by combining Equations 5.5 and 5.7 into Equation 5.8:

$$V = \max [3\,600 \cdot K_u \cdot I_t \cdot C \cdot A \cdot t - 1\,800 \cdot k \cdot A_{perc} \cdot t] \qquad (5.9)$$

Configure the trench to drain the "maximized" storm volume discussed earlier in the chapter. First, find this volume using Equation 5.2 for the 12-hour drain time and a runoff coefficient $C = 1.0$. The trench is designed to dispose of the runoff from such a storm through percolation through the sides. Because the detention time in the trench is not the issue for water quality enhancement, the maximized depth is used to define the intensity-duration function of a design storm by assuming this rainfall depth occurs within 1 hour.

The next step is to select a cross section for the trench and the type of fill material. Assume a trench length and test it for adequacy. Eventually, through a trial-and-error process, the assumed trench length agrees with the calculated one. This procedure can be reduced to a spreadsheet to facilitate the iterative solution. Figure 5.9 presents an example of such a spreadsheet. After the known parameters are entered, the iterative process begins by entering an assumed trench length and calculating the "needed trench length." New "assumed length" values are entered until a balance is achieved between the "assumed" and "needed" lengths. In this example (that is, Figure 5.8) the needed trench length was found to be 44 m (144 ft).

OTHER INFILTRATION FACILITIES. Buffer Strips and Swales. The design for buffer strips and swales is described earlier in this chapter. Both buffer strips and swales can infiltrate stormwater to the ground. However, the duration of time that runoff actually is in contact with these surfaces is relatively short, and, as a result, the volume of infiltration is limited. Nevertheless, buffer strips and swales can infiltrate significant fractions of the smaller runoff events when they are located on porous soils. Their use is encouraged,

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extended period of time and obtaining individual grab samples as well as a composite sample from each test.

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The procedures were the same for tests #6, #7 and #8 except that the 500 gallon tank was used to hold all of the water for re-circulation to the AquaShield™ Filtration System, Series 576 as previously described. The reasons for re-circulating the water during the rinse phase was for conservation purpose and to best model the influence of continued runoff contacting a contaminated surface over an extended period, thus generating a diminishing rate of contaminant flow into the AquaShield™. In other words, the water used in the last three (3) tests, had minor amounts of contamination during the rinsing of the filters. Because of this, the results of the composite samples taken during the rinse phase represents the mass of oil/diesel not held in the filters.

The total mass removal values best represent the ability of the AquaShield™ Filtration System, Series 576 to retain the oil/diesel captured in the filters. The largest value was 0.15 KG, the smallest was 0.02 KG, with an average of 0.07 KG. The largest and the smallest values were not used in determining the average amount not captured in the filters. The results of the grab samples and the composite samples taken during the rinse phase of the tests are summarized in *Table 4.*

CONCLUSIONS

This investigation confirmed the performance of the AquaShield™ Filtration System using a typical Model SD-100, Series 576 unit under controlled conditions, that had been previously documented under extreme field conditions. The accuracy and the integrity of this claim regarding the removal of 95% of oil and grease (as diesel) from contaminated water using the AquaShield™ Filtration System, has been demonstrated with the appropriate EPA test methods and confirmed through the evaluation of the data generated by those test methods.

This assessment also indicates that there is a flow proportionate removal rate, or a direct relationship between the mass of the filters in the AquaShield™ Filtration System, to the removal of oil and grease with a sustained flow of contaminated water through the system. The AquaShield™ removes 98.6%, or

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an average of 16.07 KG (from an average starting weight of 16.29 KG), of oil and grease from contaminated water flowing at 10 gpm when passed through filters weighing an average of 18.9 KG.

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The removal efficiencies (expressed as percentages) for the grab samples, the composite samples, the total mass removal, and the mass balance from each test are provided in *Table 5* for comparison. The evaluation of this data concludes that the lowest removal rate (95.4%) is from the individual grab samples as expected because they normally represent a "worst possible case" value taken at a specific moment in time during a prolonged test period.

The composite samples (96%), on the other hand, represent the total effluent over the entire test period and therefore, are more representative of the AquaShield's™ performance than the grab samples. It should be noted that the removal efficiency of the composite samples is greater than the grab samples, but only by 0.6%.

The mass removal efficiency (98.6%), also represents the whole effluent over the total test period. The mass removal calculations account for the mass of oil and grease (as diesel) captured in the filters and the amount not removed for the volume of water tested. It is clear from the assessment of this data that no less than 97% of the oil and grease that enters the AquaShield™ Filtration System (Model SD-100, Series 576), is treated, captured or removed from contaminated water.

Therefore, it can be state with a confidence level 97%, that the AquaShield™ Filtration System (Model SD-100, Series 576), sized for a 24 X 24 inch surface drain opening and a 12 inch discharge pipe, with proper installation and maintenance as described in the "Design, Operation & Maintenance Technical Manual", removes an average of 95% oil and grease in water, with the influent concentrations of 1,000 to 2,000 milligrams per liter (mg/l) or parts per million (ppm) of oil and grease and does not leach more than 0.15 kilograms (KG) of oil and grease from the filter system back into the clean water.

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AquaShield™ Filtration System
Convergence Flow Model CF-200

Table 2

"Standard" Specifications

AquaShield™ Series[E]	Pipe Size (inches)	Design Flow[A] (cfs/gpm)	Treatment Flow (cfs/gpm)	Dimensions[B] (LxWxH) (feet)	Sediment Capacity[C] (ft^3/yd^3)	Oil Removal/ Storage[D] (gallons)
60	4 - 6	0.22/100	0.22/100	5x3x4	12/0.4	86
144	8 -10	1.1/500	1.1/500	9x4x4	30/1.1	287
300	12 - 15	3.3/1500	1.9/855	10x6x5	60/2.2	517
468	18 - 21	8/3600	2.9/1305	12x6x6.5	96/3.5	759
520	24	11/4950	3.3/1485	10x8x6.5	104/3.8	860
780	30	20/9000	6.04/2718	13x8x7.5	120/4.4	1564
1200	36	30/13500	10.0/4500	15x10x8	225/8.3	2587

A) Design Flow rates are shown as approximate cubic feet per second and gallons per minute based on an "n" value of .015 and a 0.3 percent slope of the drain pipe. The filtration flow depends on site specific conditions such as actual slope of the site, hydraulic gradient, roughness coefficient of the drain pipe, and amount and duration of precipitation or washing activity, etc. Filtration is based on handling the first three-quarter inch of runoff from a 25-year storm, or specific flow rate from a washing activity. Overflow capacities are equal to the maximum flow of the designed outlet pipe to not allow backup by the AquaShield™.

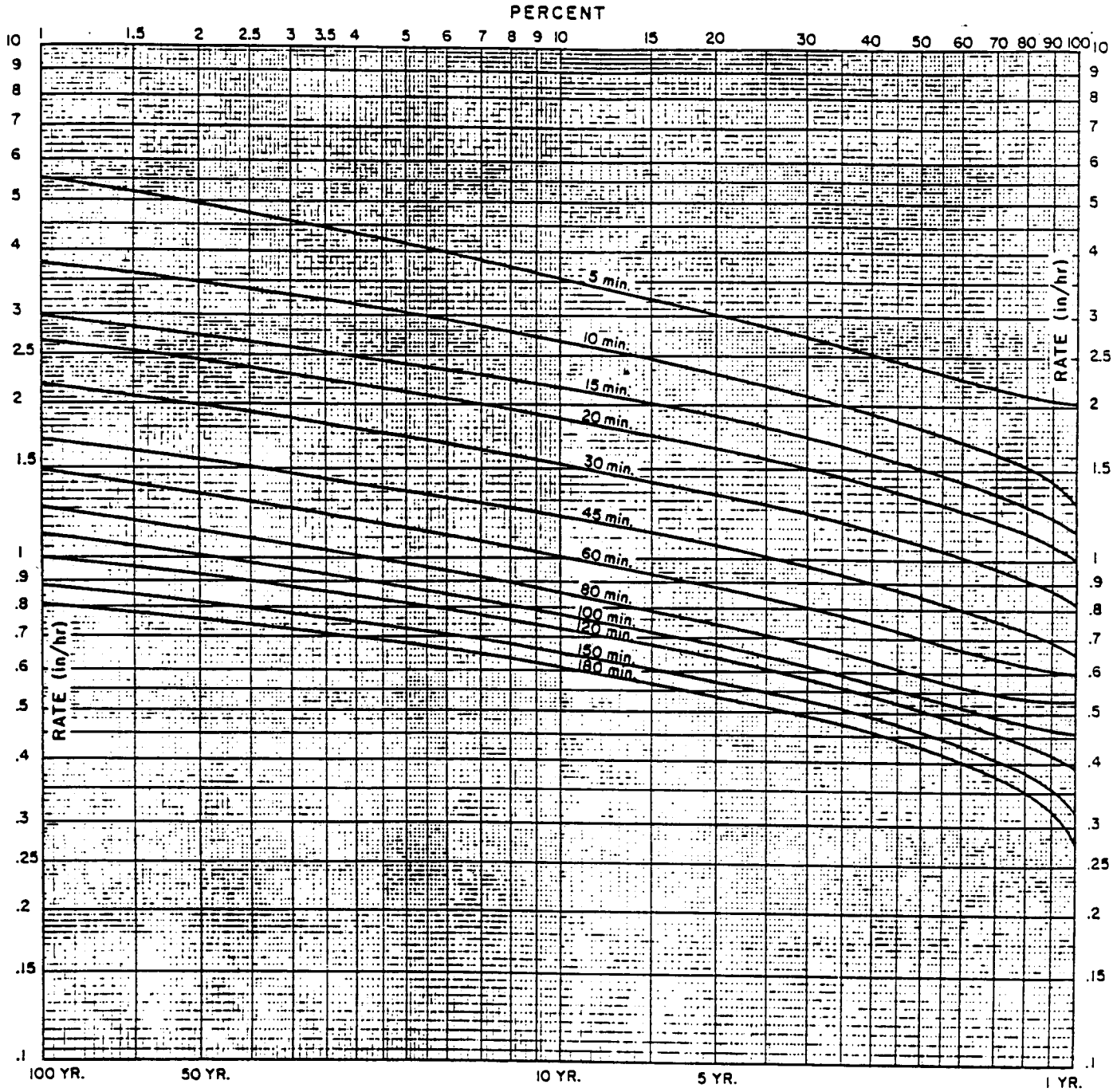
(B) Dimensions are approximate inside measurements. Excavation area should provide at least two (2) additional feet on all sides and suitable materials (sand,crushed stone) used for backfill.

(C) Sediment Capacities are approximate. Cleaning is recommended before total capacity is reached.

(D) Oil Removal/Storage capacities are approximate. Larger capacities are available upon request. Maintenance and Warranty Agreement with local distributor or Remedial Solutions, Inc. is dependant on the specific application and site conditions.

(E) Shipping weight will be provided for a specific series which includes AquaShield™ and filter media.

STORM FREQUENCY CHART



U.S.W.B. of Los Angeles, 1897-1944

Figure G 212A

F. J. DORAN — 1958
A. W. A.

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BOE - City of Los Angeles

FOSSIL FILTER™

HYDRAULIC TESTING

On June 4, 1998, tests were conducted by consulting civil engineer Robert E. Burke of Eagle Engineering of Sacramento to demonstrate the actual hydraulic capacity of operating filters as a follow-on to the test program of the City of Sacramento entitled "SACRAMENTO STORMWATER MONITORING PROGRAM; NDMP STORMWATER CONTROL MEASURE STUDY." The tests were conducted on two Fossil Filter drop-in units in the paved yard of Tenco Tractor in West Sacramento.

SITE #1: A square (24" x 24") drop inlet with a square welded steel grate mounting a square Fossil Filter (model FF2424H) with a net length of the filter elements of 76" (6.3'). The manufacturer rates the capacity of Fossil Filters as 12 GPM per linear foot of filter element. The manufacturers rated capacity of the FF2424H filter is given by the formula 12 gpm/l.f. x 6.3 l.f. = 76 GPM.

SITE #2: A round drop inlet (24" diameter) with a circular cast iron grate and mounts a round Fossil Filter (model RF24) with a net length of filter element of 47" (3.9'). The manufacturers rated capacity of the RF24 filter is given by the formula 12 gpm/l.f. x 3.9 l.f. = 47 gpm.

TEST METHODOLOGY: Water from a fire hydrant was metered and fed to the sites through a 1 1/2" fire hose. A flow rate equivalent to the rated capacity of the filters was established and the performance of the filters observed. The flow rate was then increased to the maximum flow of the hydrant and the performance of the filters observed.

OBSERVATIONS: At the manufacturers rated capacity of 12 gpm/l.f. filter, both filters flowed freely without backup or overflow; however, at the round inlet (Site #2), some water flowed along the bars of the grate into the inlet center and bypassed the filter.

At the maximum available flow (approximately 100 gpm), the square filter flowed freely without backup; however, the velocity of the water as it struck the grate caused some splashing with localized overflow of the filter's inner baffle. The round filter also flowed freely without backup; however, an estimated 15% of the water flowed along the bars of the grate to the center and bypassed the filter. With the grate removed and the entire flow entering the filter, the flow exceeded the filter's capacity and the water overflowed the inner baffle.

To recap, both Fossil Filters performed satisfactorily at their rated capacity of 12 gpm/l.f. filter without backup or overflow. At maximum available flow (125% of rated capacity), the square unit was still operating well below ultimate capacity. The round unit, at a flow rate of 100 gpm (208% of rated capacity), was overwhelmed and water overflowed the inner baffle.

CONCLUSIONS: The tests demonstrated that Fossil Filters can accomodate flows claimed by the manufacturer. With proper design and installation of the inlet structure, the filters will accomodate flows well in excess of the manufacturers rating.

FOSSIL FILTER™

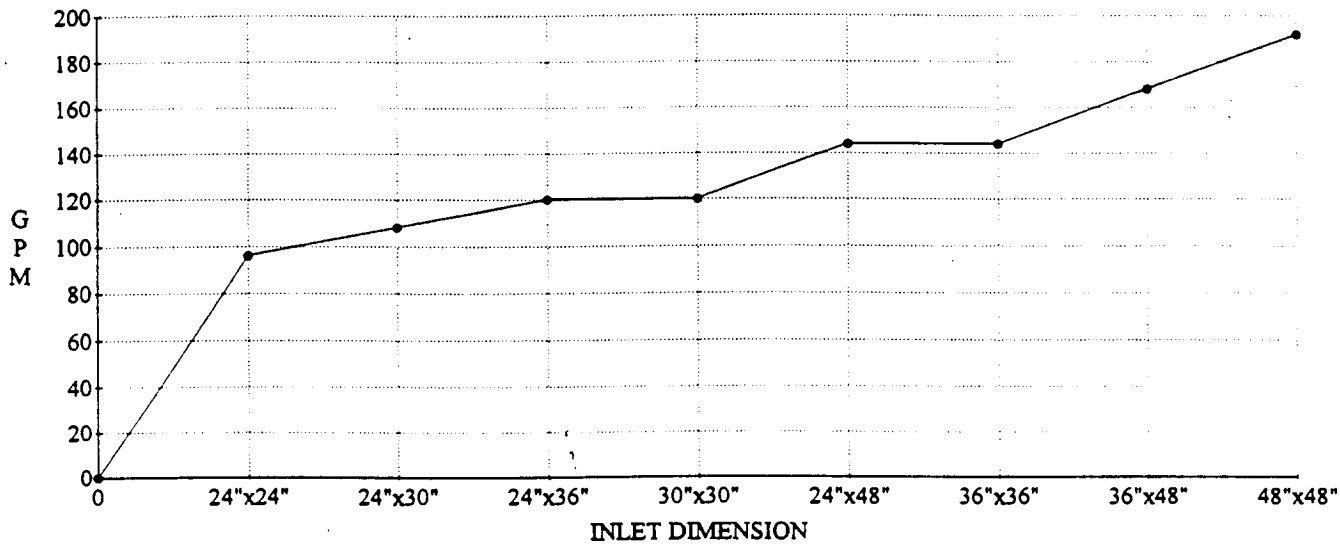
FILTRATION CAPACITY

Charts shown below reflect the *effectively filtered* hydraulic flow capacity of both rectangular grated inlets and curb inlets of various sizes.

The data shown on the charts is based on the hydraulic testing performed by Sandine & Associates (see attached letters). Testing has shown that a flow rate of **12 GPM per linear foot of *Fossil Filter™*** is effectively filtered by the installed ***Fossil Rock™*** filter media.

HYDRAULIC CAPACITY CHART

Rectangular Grated Inlet Application



HYDRAULIC CAPACITY CHART

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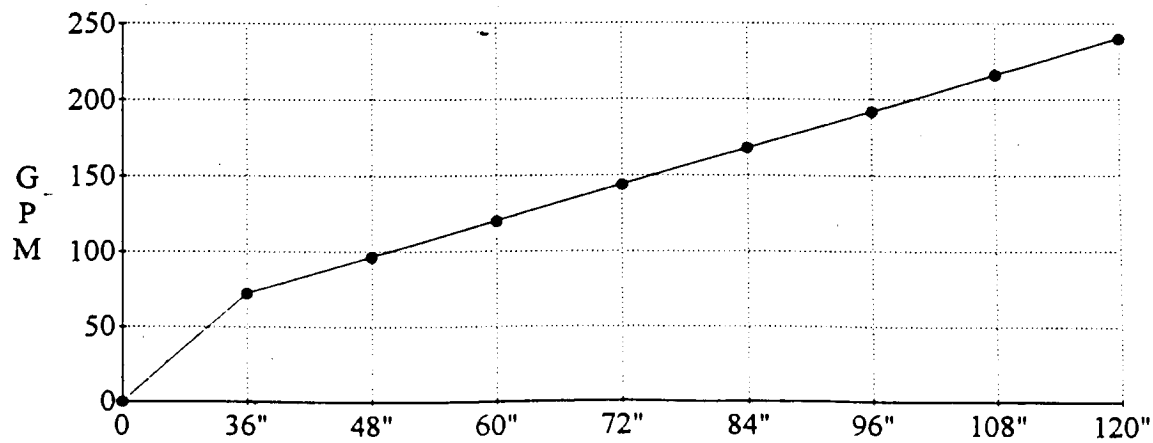
Curb Inlet Application



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Sewer Design

The collection and analysis of rainfall data and preparation of IDF curves for the site condition are done only for extensive projects. Generally, the rainfall data and the maps prepared by the National Weather Service and other government agencies are used in place of the local statistical analysis, to prepare the IDF curves for the locality selected.

In the absence of data and maps to prepare the curves, empirical relations are used for the duration of less than 2 hours. For any given frequency, the intensity is related to the duration by a relation of eq. (3.15):

$$i = \frac{A}{t + B} \quad \text{[unbalanced]} \tag{3.15}$$

where

i = intensity, in./hr

t = duration, min

A, B = constants that depend on the frequency and climatic conditions

The values for constants A and B are obtained using observed rainfall or the National Weather Service data for the locality selected. General values of the constants for the different parts of the country (Figure 3.7) are given in Table 3.8 for frequency levels of 2, 5, 10, 25, 50, and 100 years.

For application in the rational formula, the extreme (probable maximum, etc.) value of the rainfall intensity is not used because nearly complete protection of the area is not justified. The following range of design frequency is commonly used:

1. 2 to 15 years for sewers in residential areas, most commonly 10 years
2. 10 to 50 years for sewers in commercial and high-value areas
3. 50 years or more for flood-protection works

12.7.5 Time of Concentration, t_c

With regard to storm duration to be considered for runoff assessment, a term "time of concentration, t_c," is relevant. It is defined as the time required for runoff from the hydraulically most remote part of the drainage area to reach the point of reference. There is another definition of this term as well, as stated in Section 7.8.1. For various routes of flow, t_c is taken as the longest time of travel to the point of reference. Since rainfall intensity reduces with increase in storm duration, the duration should be as short as possible. However, if the rainfall duration is less than t_c, then only a part of the drainage area will be contributing to the runoff. For an entire area to contribute, the shortest storm duration should equal the t_c. Thus the time of concentration is used as a unit duration for which the rainfall intensity is determined.

In storm sewer design, in addition to the time required for the rain falling on a most remote point of the tributary area to flow across the ground surface, along streets and gutters, to the point of entry to a sewer, the time of flow through the sewer line is also important. Either the surface and sewer flow times are added together (rational method) or they are considered separately (SCS-55 method). There are many ways to estimate t_c. Some of these are designed primarily for overland flow, some primarily for channel flow, and a few for both overland and channel

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Sewer Design

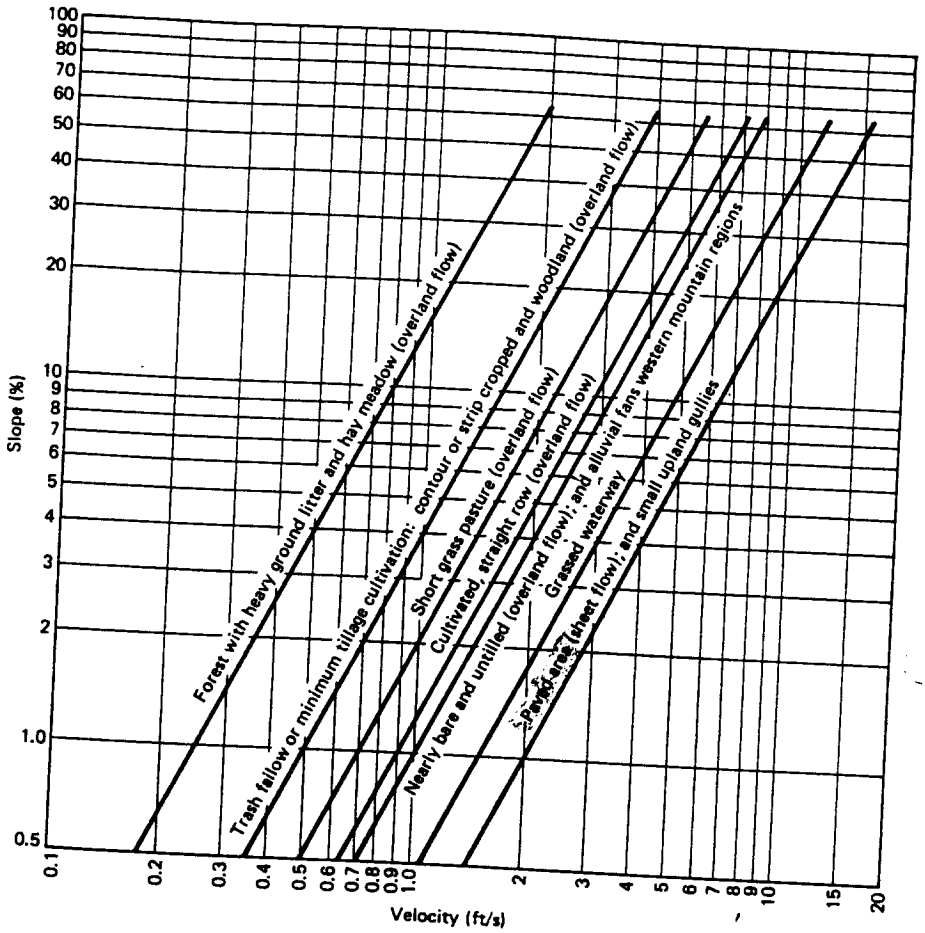

Figure 12.7 Average velocity of overland flow (from U.S. SCS, 1975b).

After a maximum of 300 ft, sheet flow usually becomes shallow concentrated flow. The average velocity for this flow can be determined from Figure 12.7 using the land slope and the type of soil cover. The travel time for shallow concentrated flow is the length divided by the average velocity.

Open channel is assumed to begin where a channel form is visible from field investigations or on aerial photographs. Manning's equation of open channel flow is used to determine the average velocity and the travel time therefrom.

Whenever a drainage area consists of several types of surfaces, the time of concentration is determined by adding the times for different surfaces.

Example 12.8

An urbanized watershed in Providence, Rhode Island, is shown in Figure 12.8. Determine the time of concentration to point C by the various methods. The average velocity of flow in storm drain = 1 m/s.

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APPENDIX D

Appendix D is used for sizing infiltration facilities (TC 1) and extended detention basins (TC 5). The sizing criteria was determined using the Storage, Treatment, Overflow, Runoff Model (STORM) as developed by the U.S. Corp of Engineers. STORM was applied to long-term, hourly rainfall data at fifteen (15) rain gauges across the State. Based on this analysis nine gauges were selected as being representative for sizing detention storage facilities (see Figure D.1). Zones were drawn to reflect these nine gauges taking into consideration rainfall data and topography. The sizing curves should apply to most areas within each zone. However, the zone boundaries are approximate and certain areas within each zone will be strongly influenced by topographic features.

Each sizing curve was developed using the following parameters:

- A drawdown time from the entire storage volume of 40 hours. This drawdown time allows quiescent conditions to establish in the basin, resulting in at least 80% sediment removal for most soils in California.
- Initial abstraction/depression storage on impervious surface of 0.06 inch.
- Runoff coefficient of 0.9 for impervious surfaces and 0.15 for pervious surfaces.

Appendix D may be used in the following manner:

1. Identify the appropriate zone for your location from Figure D.1 and Table D.1 and then select the appropriate detention storage figure for your zone.
2. Determine for the drainage area the percentage of impervious area directly connected to the storm drain system. Directly connected impervious area (DCIA) is defined as the area covered by pavement, building, and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).
3. Choose a capture goal, and read the required unit volume required for the basin. In selecting the capture goal consider the requirements of the local municipality or a point at the "knee of the curve". Once the capture goal has been established draw a horizontal line from the capture goal to the appropriate DCIA curve, then a vertical line to the unit storage volume.
4. Multiply the unit volume times the total acreage of the drainage area and convert to acre-feet or cubic feet.

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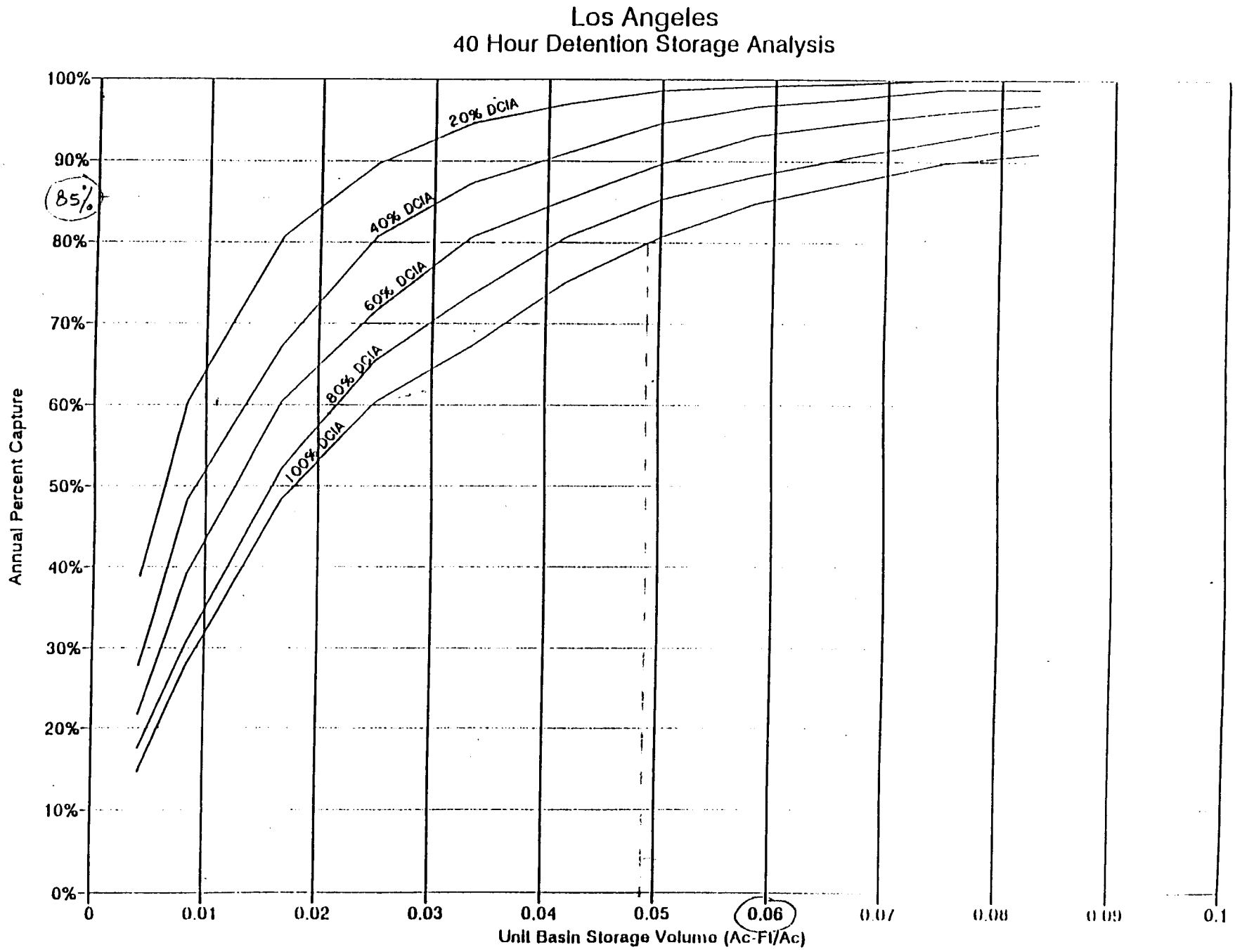
Los Angeles
40 Hour Detention Storage Analysis
Annual Percent Capture
100%
90%
85%
80%
70%
60%
50%
40%
30%
20%
10%
0%
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
Unit Basin Storage Volume (Ac-Ft/Ac)

WEF Manual

AN APPROACH FOR ESTIMATING STORMWATER QUALITY CAPTURE VOLUME. Estimating a Maximized Water Quality Capture Volume. Whenever local resources permit, the stormwater quality capture volume may best be found using continuous hydrologic simulation and local long-term hourly (or lesser time increment) precipitation records (see Chapter 3). However, it is possible to obtain a first-order estimate of the needed capture volume using simplified procedures that target the most typically occurring population of runoff events.

Figure 5.3 contains a map of the contiguous 48 states of the U.S. with the mean annual runoff-producing rainfall depths superimposed (Driscoll *et al.*, 1989). These mean depths are based on a 6-hour interevent time to define a new storm event and a minimum depth of 2.5 mm (0.10 in.) of precipitation for a storm to produce incipient runoff. After an extensive analysis of a number of long-term precipitation records from different meteorological regions of the U.S., Guo and Urbonas (1995) found simple regression equations to relate the mean precipitation depths in Figure 5.3 to "maximized" water quality runoff capture volumes (that is, the knee of the cumulative probability curve).

The analytical procedure was based on a simple transformation of each storm's volume of precipitation to a runoff volume using a coefficient of runoff. To help with this transformation, a third-order regression equation, Equation 5.1 (Urbonas *et al.*, 1990), was derived using data from more than 60 urban watersheds (U.S. EPA, 1983). Because the data were collected nationwide over a 2-year period, Equation 5.1 should have broad applicability in the U.S. for smaller storm events.

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04 \qquad (5.1)$$

Where

C = runoff coefficient, and
i = watershed imperviousness ratio; namely, percent total imperviousness divided by 100.

Equation 5.2 relates mean precipitation depth taken from Figure 5.3 to the "maximized" detention volume. The coefficients listed in Table 5.4 are based on an analysis of long-term data from seven precipitation gauging sites located in different meteorological regions of the U.S. The correlation of determination coefficient, r^2, has a range of 0.80 to 0.97, which implies a strong level of reliability.

$$P_0 = (a \cdot C) \cdot P_6 \qquad (5.2)$$

Where

P_0 = maximized detention volume determined using either the event capture ratio or the volume capture ratio as its basis, watershed in. (mm);

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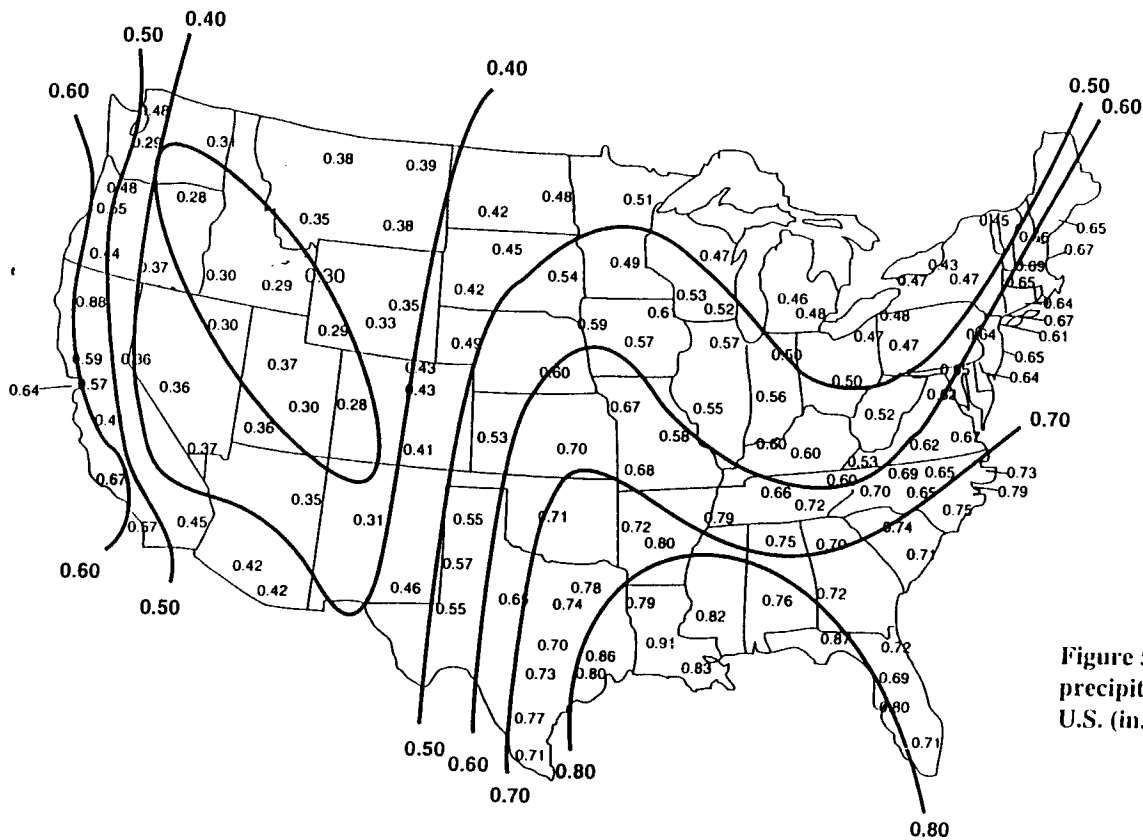

Figure 5.3 Mean storm precipitation depth in the U.S. (in. [in. × 25.4 = mm]).

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Table 5.4 **Values of coefficient a in Equation 5.2 for finding the maximized detention storage volume (Guo and Urbonas, 1995).**[a]

		Drain time of capture volume		
		12 hours	**24 hours**	**48 hours**
Event capture ratio	a =	1.109	1.299	1.545
	r^2 =	0.97	0.91	0.85
Volume capture ratio	a =	1.312	1.582	1.963
	r^2 =	0.80	0.93	0.85

[a] Approximately 85th percentile runoff event (range 82 to 88%).

a = regression constant from least-squares analysis;
C = watershed runoff coefficient; and
P_6 = mean storm precipitation volume, watershed in. (mm).

Table 5.4 lists the maximized detention volume/mean precipitation ratios based on either the ratio of the total number of storm runoff events captured or the fraction of the total stormwater runoff volume from a catchment. These can be used to estimate the annual average maximized detention volume at any given site. All that is needed is the watershed's runoff coefficient and its mean annual precipitation.

The actual size of the runoff event to target for water quality enhancement should be based on the evaluation of local hydrology and water quality needs. However, examination of Table 5.3 indicates that the use of larger detention volumes does not significantly improve the average annual removal of total suspended sediments or other settleable constituents. It is likely that an extended detention volume equal to a volume between the runoff from a mean precipitation event taken from Figure 5.3 and the maximized event obtained using Equation 5.2 will provide the optimum-sized and most cost-effective BMP facility. A BMP sized to capture such a volume will also capture the leading edge (that is, first flush) of the runoff hydrograph resulting from larger storms.

Runoff volumes that exceed the design detention volume either bypass the facility or receive less efficient treatment than do the smaller volume storms and have only a minimal net effect on the detention basin's performance. If, however, the design volume is larger and has an outlet to drain it in the same amount of time as the smaller basin, the smallest runoff events will be detained only for a brief interval by the larger outlet. Analysis of long-term precipitation records in the U.S. shows that small events always seem to have the greatest preponderance. As a result, oversizing the detention can cause the most frequent runoff events to receive less treatment than provided by properly designed smaller basins.

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STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

CALCULATIONS TO DETERMINE EQUIVALENT PERCENT VOLUME CAPTURE CRITERION

The calculation to determine the equivalent criterion using the percent volume capture method indicates that 85 percent volume capture is closest to the maximized water quality treatment volume method and the 85th percentile rainfall event treatment volume for Los Angeles County (0.75 inch). The unit basin storage volumes were determined from the California Stormwater BMP Handbook- Industrial/ Commercial, Pg. D7.

(a) For 90 percent annual runoff volume capture for 40 hours

- ⇨ Unit basin storage volume = 0.075 ac-ft/ac
- ⇨ Required storage volume = Unit basin storage x Area of site
  = 0.075 ac-ft/ac x 5.51 ac
  = 0.4133 ac-ft
  = 18,003 ft^3 = 134,665 gal.

(b) For 85 percent annual runoff volume capture for 40 hours

- ⇨ Unit basin storage volume = 0.06 ac-ft/ac
- ⇨ Required storage volume = Unit basin storage x Area of site
  = 0.06 ac-ft/ac x 5.51 ac
  = 0.3306 ac-ft
  = 14,401 ft^3 = 107,719 gal.

(c) For 80 percent annual runoff volume capture for 40 hours

- ⇨ Unit basin storage volume = 0.05 ac-ft/ac
- ⇨ Required storage volume = Unit basin storage x Area of site
  = 0.05 ac-ft/ac x 5.51 ac
  = 0.2755 ac-ft
  = 12,001 ft^3 = 89,765 gal.

(d) For 75 percent annual runoff volume capture for 40 hours

- ⇨ Unit basin storage volume = 0.04 ac-ft/ac
- ⇨ Required storage volume = Unit basin storage x Area of site
  = 0.04 ac-ft/ac x 5.51 ac
  = 0.2204 ac-ft
  = 9,601 ft^3 = 71,813 gal.

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(e) For 70 percent annual runoff volume capture for 40 hours

- ⇨ Unit basin storage volume = 0.035 ac-ft/ac
- ⇨ Required storage volume = Unit basin storage x Area of site
  = 0.035 ac-ft/ac x 5.51 ac
  = 0.1929 ac-ft
  = 8,401 ft^3 = 62,836 gal.

(f) For 50 percent annual runoff volume capture for 40 hours

- ⇨ Unit basin storage volume = 0.018 ac-ft/ac
- ⇨ Required storage volume = Unit basin storage x Area of site
  = 0.018 ac-ft/ac x 5.51 ac
  = 0.099 ac-ft
  = 4312 ft^3 = 32,257 gal.

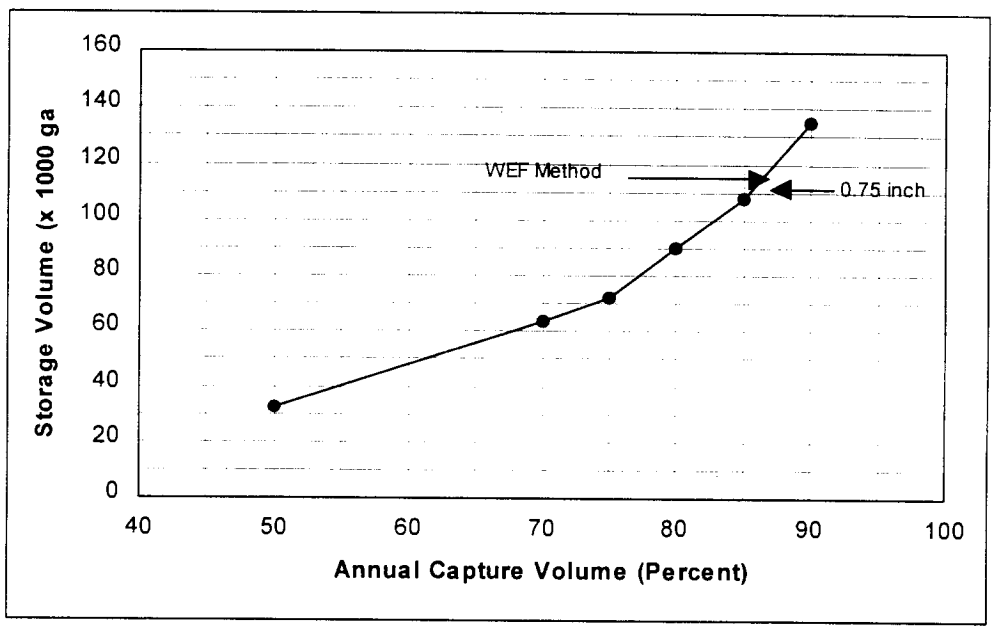

Figure. Detention Basin treatment storage volume that is required for different total annual runoff volume percent capture for a 5.5 acres site. The WEF Method is the 85th percentile 24-hour storm event capture, which requires 118,296 gal. The 0.75-inch method would require 112,200 gal. The equivalent criterion under the California Handbook method would require annual storm water volume capture of 85 percent, which calculates to 107,719 gal.

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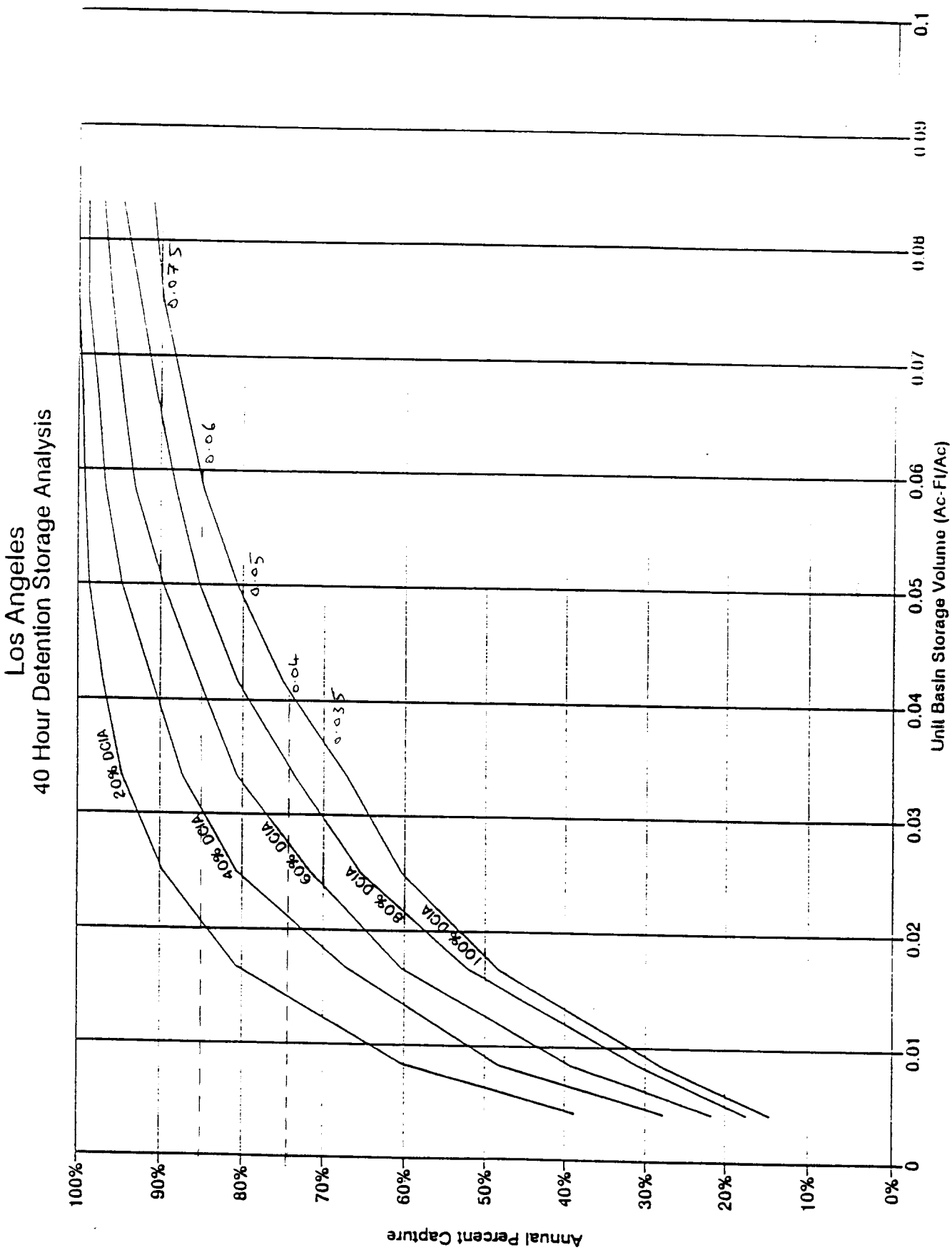
Los Angeles
40 Hour Detention Storage Analysis
Annual Percent Capture
Unit Basin Storage Volume (Ac-Ft/Ac)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.1
0.075
0.06
0.05
0.04
0.03
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA

STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

TOTAL RUNOFF VOLUME AND TWENTY-FOUR HOUR RAINFALL DEPTH

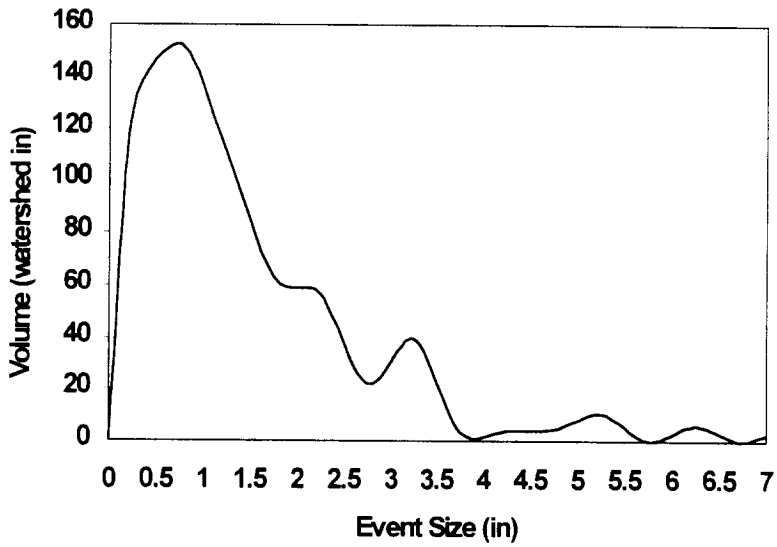

Figure. Approximate runoff volume produced by different rainfall depths based on the 50-year record of rainfall events at LAX. Small rainfall events not exceeding 1 inch produce the bulk of storm water runoff volumes. The storm water runoff volumes transport pollutants from urban areas, which impair receiving water quality.

STANDARD URBAN STORM WATER MITIGATION PLANS

NUMERICAL MITIGATION CRITERIA FOR DEVELOPMENT PLANNING

PARKING LOT SIZE EQUIVALENCY CALCULATION

LA County municipal storm water permit establishes threshold of 25 parking spaces for applicability of requirements. (LA Permit, Pt 2. Section I.E.a.ix.)

Long Beach municipal storm water permit establishes threshold of 10 parking spaces for special study. (LB Permit, Pt. 4. Section J.I.1)

Standard space for vehicle storage = 160 sq. ft. (*Start at the Source*, BASMAA (1999) Section 6.3, p 61)

When combined with support space such as access roads, driveways, curbs, overhang space, median islands, a lot can require up to 400 sq. ft. per vehicle (*Start at the Source*, BASMAA (1999) Section 6.3, p 61)

Use 200 sq. ft. as required space per vehicle with support space. The trend is to minimize support space in areas such as LA where land is at premium.

25 parking spaces lot = 200 x 25 = 5,000 sq. ft.

10 parking spaces lot = 200 x 10 = 2,000 sq. ft.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
...rne Street
..., CA 94105-3901

OFFICE OF THE
REGIONAL ADMINISTRATOR

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To D. Dickerson	From Mike Schultz
Dept./Agency RB4	Phone #
Fax # 213-576-6625	Fax # 415-744-1235

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

H. David Nahai, Chairman
Los Angeles Regional Water Quality Control Board
320 West 4th St., Suite 200
Los Angeles, CA 90013

Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality Control Board
320 W. 4th St., Suite 200
Los Angeles. CA 90013

Dear Mr. Nahai and Mr. Dickerson:

I'm pleased to provide you with the final report of EPA Region 9's review of the Los Angeles Regional Water Quality Control Board's National Pollution Discharge Elimination System (NPDES) program, conducted on June 3-5, 1998. In the 1970s and 1980s, EPA regularly reviewed delegated state environmental programs to ensure compliance with all requirements. After conducting a number of these reviews during those years, EPA Region 9 increasingly found that delegated programs in our states had few if any problems, so by the early 1990s, we had markedly reduced our state oversight activities. Last year, we resumed conducting reviews of state administered National Pollution Discharge Elimination System (NPDES) programs for several reasons. First, it had been at least five years since Region 9 had conducted reviews of state-administered NPDES programs. In part, the reviews were initiated to respond to national concerns highlighted by EPA's Office of Inspector General regarding the quality of state programs nationally. Consistency of state enforcement programs across the country - the "level playing field" concept - remains on the Inspector General's top ten list of significant issues facing EPA, and the Office of Management and Budget has expressed concern about backlogs of expired NPDES permits. For all these reasons, we re-initiated NPDES program reviews in our Region, working with the state agencies to be reviewed, to ensure effective state administration of the NPDES program.

In planning its review of the State of California, EPA focused on the Regional Boards with the largest NPDES programs–Sacramento, Los Angeles, and San Diego--and conducted its first review at the Los Angeles Regional Board. During our review of the Los Angeles Regional Board, EPA was aware of the 1997 Heal the Bay report criticizing its administration of the

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NPDES program. However, EPA's review of the Los Angeles Board is an independent, objective evaluation, based upon EPA's requirements for the NPDES program and applicable written agreements between EPA and the State of California. While our review didn't confirm or deny the specifics of Heal the Bay's review, we did note a comparable past history of weak NPDES enforcement by the Los Angeles Board. However, we also noted significant improvement by the Board over the past 2-3 years in both eliminating expired permit backlogs and in taking enforcement action. For example, since the EPA review, the Board assessed a record $2.3 million penalty against the City of Thousand Oaks for an 86 million gallon sewage spill. Also, in the past year, the Board has achieved an impressive record of enforcement actions and penalty assessments, a marked improvement over past performance, due largely to the leadership of the Regional Board, its Executive Officer, and the establishment of a separate Enforcement Unit. We commend these achievements.

Our review of the Los Angeles Board's NPDES program encompassed five main NPDES activities: permitting, compliance, pretreatment, storm water, and enforcement, over the time period from 1995 through June 1998. The enclosed Executive Summary includes commentary regarding the strengths of the Los Angeles Board's administration of the NPDES program, discussion of issues arising State-wide that require change at all the Regional Boards, the changes that are required at the Los Angeles Board, and other suggestions that EPA offers for the Los Angeles Board's consideration. In brief, the strengths in the Los Angeles Board's NPDES program include:

- Between 1995 and 1998, the Board eliminated their backlog of 70 percent-expired NPDES permits.
- The Board has an excellent review, tracking, and inspection program to assess permit compliance of major and minor NPDES permittees.
- The Board has shown leadership by developing a new data system that will replace California's current data system for dischargers.
- In the storm water program, though much more needs to be done, the Board's small staff is doing what they can to address the huge universe of regulated facilities.
- There has been significant increase in both the number of enforcement actions taken and penalties assessed, as discussed above.

Changes that need to be made by all the Regional Water Quality Control Boards in California, including the Los Angeles Board, to fully comply with all NPDES program requirements include:

- The current lack of State-wide water quality standards for toxic pollutants results in NPDES water quality permit limit problems at all the Regional Boards. Until EPA's promulgation of the California Toxics Rule and the State's adoption of the Inland Surface Waters and Enclosed Bays and Estuaries Plan's Implementation Policy, all the Regional

Water Boards should refer to EPA's *Technical Support Document for Water Quality-based Toxics Control*, and to examples of fact sheets and permits that will be provided by the State Board.

- Penalty actions need to comply with State penalty policies.
- Greater inspection presence is needed in the storm water program, which is significantly under funded State-wide.
- Pretreatment program expertise needs to be strengthened and industrial user regulation is needed.

Changes needing to be made that are specific to the Los Angeles Board to fully comply with all NPDES program requirements include:

- NPDES permits must ensure that aquatic life is protected from toxics by establishing appropriate, protective effluent limits consistent with Basin Plan objectives.
- The Los Angeles Board must carefully observe all procedural requirements in issuing NPDES permits in order to avoid potential permit challenges based on procedural grounds.
- For storm water, the Board needs to review and comment on the Los Angeles County storm water permit model program submittals, since successful implementation of this permit depends on these reviews.
- In pretreatment, the Board must complete the review and approval process for local limits programs as well as one overall pretreatment program.
- All formal enforcement actions taken by the Board must require compliance by a date certain, and contain appropriate interim effluent limits and schedule milestone dates.
- The Board's current emphasis on enforcement is commended, and needs to be continued.

Based on this review, once the required changes are made, EPA believes that the Los Angeles Board will be administering an NPDES program that meets all applicable requirements, though limited by available resources.

EPA's review provides us all with a great opportunity to ensure that our mission, to protect public health and the environment, is successfully achieved. The enclosed evaluation focuses on the legal and policy requirements of the NPDES program, but doesn't address other perhaps less tangible aspects of our shared responsibilities, such as opportunities for leadership in environmental and public health protection. The Board's enforcement action on the Thousand Oaks spill, and the Board's record of enforcement since the Thousand Oaks action, demonstrate the kind of leadership and profile that stimulates compliance and a cleaner environment. We commend the Los Angeles Board for this record of recent action, and urge you to continue this vigorous enforcement program.

Alexis Strauss and Mike Schulz of our Water Division will be pleased to discuss this review in more detail with you if you wish. We sincerely appreciate the participation and cooperation of you and your staff, as well as that of the State Water Resources Control Board, in our shared endeavors to better manage water resources in California.

Yours,

Felicia Marcus
Regional Administrator

Enclosure

cc: Winston Hickox, CalEPA
Walt Pettit, SWRCB
John Norton, SWRCB

NPDES PROGRAM IMPLEMENTATION REVIEW
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD 4
LOS ANGELES REGION



U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 9
FINAL REPORT - OCTOBER 1999

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NPDES PROGRAM IMPLEMENTATION REVIEW - FINAL REPORT
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD 4
LOS ANGELES REGION

October 1999

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Attachment--Table 2, RWQCB 4 NPDES Program Organization Chart

Attachment--Table 3, RWQCB 4 NPDES Permitted Facilities

Attachment--Table 4, RWQCB 4 Approved Pretreatment Programs & Activities

Attachment--Table 5, Inventory of RWQCB 4 Major NPDES Actions by Year

Appendix A, State-wide NPDES Program Issues

NPDES PROGRAM IMPLEMENTATION REVIEW
LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

EXECUTIVE SUMMARY

On June 3 through 5, 1998, the U.S. Environmental Protection Agency, Region 9 (EPA), conducted a review of the Los Angeles Regional Water Quality Control Board's (the L. A. Board, or Board) approved National Pollution Discharge Elimination System (NPDES) program. The review was conducted by EPA to assess the L. A. Board's implementation of the NPDES program, generally covered the time period from 1995 through 1998, and focused on five main NPDES activities: permitting, compliance, pretreatment, storm water, and enforcement. EPA conducted its review by evaluating a representative sample of the L. A. Board's NPDES program files, documents, quarterly and other reports, and by conducting interviews of the L. A. Board's NPDES program managers and staff. This report presents the results of EPA's review, summarized below.

The L. A. Board's jurisdiction covers nearly 4,000 square miles, services more than 10 million people, and includes approximately 390 surface water body segments, of which 40 percent are recognized as having impaired beneficial uses, including Santa Monica Bay, the Los Angeles River, and Malibu Creek. In addition, 11 Publicly Owned Treatment Works (POTWs) in the L. A. Board's jurisdiction receive discharges from industries comprising half of the total industries in California, accounting for a significant component of the toxics control accomplished in the State under the Clean Water Act. The L. A. Board regulates 44 major and 260 minor NPDES permitted facilities, regulates 345 enrollees under six different general permits, is responsible for 2,600 industrial facilities and 600 construction sites that are subject to storm water regulations, and regulates Ventura and Los Angeles Counties with municipal storm water permits, with 11 and 86 co-permittees, respectively.

EPA's NPDES program reviews conducted in California to date at the Los Angeles, San Diego, and Sacramento Regional Water Quality Control Boards have revealed issues which are applicable throughout the State of California. These issues, as agreed upon by the State Water Resources Control Board (SWRCB), all nine Regional Water Quality Control Boards (RWQCBs), and EPA, are listed below. EPA is working with the SWRCB and the RWQCBs to identify and implement solutions to these State-wide NPDES program needs, as discussed in more detail in Appendix A of this report.

- The current lack of State-wide water quality standards for toxic pollutants results in NPDES permit issuance problems at the RWQCBs.
- Adoption of NPDES permits containing compliance schedules for water quality based effluent limitations is not allowable, unless an authorizing provision is contained in the

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applicable water quality control plan. This issue is not applicable to the Oakland and Sacramento RWQCBs, which have the necessary authorizing provisions.

- Appropriate receiving water limitations language, for which acceptable model language has been developed by EPA, the SWRCB, and the California Storm Water Quality Task Force, needs to be included in all forthcoming municipal storm water permits.
- Permit fact sheets/statements of basis need to clearly establish that permits are consistent with applicable statutes, regulations, and policy.
- Copies of inspection reports of major permittees, as well as copies of responses from permittees about violation follow-up, must be sent by all RWQCBs to EPA.
- Compliance review of Discharge Monitoring Reports (DMRs) is often not timely.
- Quarterly Non-Compliance Reports (QNCRs) need improvement in quality and content.
- Field presence/compliance assessment at NPDES major/minor facilities is not adequate.
- A greater inspection presence in the storm water program for both industrial and construction sites needs to be established by all RWQCBs.
- Pretreatment program expertise needs to be increased, industrial user regulation by the State is needed, and industrial user compliance problems must be addressed by the State.
- All RWQCB penalty actions need to comply with State penalty policies.

EPA's review conducted at the L. A. Board identified both specific NPDES program strengths and areas for improvement, as discussed below, applicable to their implementation of the NPDES program.

PERMITS

Strengths

In Fiscal Year (FY) 1994/1995, the L. A. Board had a NPDES permit backlog (individual permits including storm water) with nearly 70 percent of their permits requiring reissuance. In 1995, the L. A. Board implemented a watershed permitting approach, whereby priorities for permit issuance are being established consistent with emphasis on priority watersheds. At the end of FY 1997/1998, the L. A. Board was reissuing all permits in accordance with its workplan schedule for permit issuance, with only a few minor permits remaining backlogged. This permit backlog reduction is a significant accomplishment. In addition, the L. A. Board is coordinating the setting of water quality standards with NPDES permitting using a priority watershed approach, which results in better permits. The L. A. Board is establishing water quality based effluent limitations for toxic chemicals in NPDES permits based on "reasonable potential," when a pollutant causes, or has the reasonable potential to cause or contribute to an exceedance of narrative or numeric water quality standards. Also, where "reasonable potential" is established and numeric water quality objectives for toxic chemicals are lacking, the L. A. Board is using the Basin Plan narrative toxicity objective in conjunction with numeric criteria for toxic chemicals to establish water quality based effluent limitations which, in most cases, ensures protection of beneficial uses.

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Required Changes

Though the L. A. Board is implementing an NPDES permitting program which is effective overall, the following changes must be made in order to fully comply with all requirements.

State-wide Issues

The current lack of State-wide water quality standards for toxic pollutants, and the absence of a plan of implementation for establishing water quality based effluent limits for toxics and whole effluent toxicity, results in NPDES permit issuance problems at all the RWQCBs, including the L. A. Board. EPA promulgation of the California Toxics Rule (CTR) and the State's adoption of the Inland Surface Waters and Enclosed Bays and Estuaries Plan's Implementation Policy are expected to address this issue for most constituents. In the interim, to ensure permits are issued as required, all the RWQCBs should refer to EPA's *Technical Support Document for Water Quality-based Toxics Control* (*Technical Support Document, or TSD*), and to fact sheets and permits that will be provided as examples by the SWRCB.

During the period prior to adoption of the CTR and the State's Implementation Policy, all RWQCBs should develop a permitting process to ensure consistent establishment of water quality based effluent limits using Basin Plan objectives and other protective numeric criteria. In addition, during the period prior to adoption and implementation of Total Maximum Daily Loads (TMDLs) for 303(d) listed waters, all RWQCBs should develop a permitting process which ensures consistent establishment of water quality based effluent limits for discharges to 303(d) listed waters without TMDLs, where discharges are found to contain pollutants causing or contributing to non-attainment of water quality standards.

Adoption of NPDES permits by the RWQCBs containing compliance schedules for water quality based effluent limitations is not allowable unless an authorizing provision is contained in applicable water quality control plans, an issue applicable to all RWQCBs except Oakland and Sacramento which have the necessary authorizing provisions. Several of the L. A. Board's tentative permits that were reviewed contained unauthorized compliance schedules for water quality based effluent limitations. These concerns, however, have been fully addressed, and Time Schedule Orders (TSOs) for these facilities were issued by the L. A. Board to meet this requirement.

All RWQCBs including the L. A. Board need to ensure that permit fact sheets/statements of basis clearly establish that permits are consistent with applicable statutes, regulations, and policy (e.g., reasonable potential, antibacksliding, establishing mixing zones, determining dilution credits, etc.). Along with summary explanations, fact sheets/statements of basis need to provide additional explanation detailing the basis for requiring water quality based effluent limitations, including reasonable potential procedures and the method used to implement water quality objectives/criteria as effluent limits.

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Appropriate receiving water limitations language, for which acceptable model language has been developed by EPA, the SWRCB, and the California Storm Water Quality Task Force, needs to be included in all forthcoming municipal storm water permits from the RWQCBs, including the L. A. Board. EPA notes the June 17, 1999, adoption by the SWRCB of a policy requiring all RWQCBs to include this model language in permits.

Issues Specific to the L. A. Board

The L. A. Board must establish metals effluent limits in the "total recoverable" form rather than the "dissolved" form. When recent toxic chemical effluent data indicate the "reasonable potential" to exceed the Basin Plan narrative toxicity objective protecting aquatic life beneficial uses, the L. A. Board must establish water quality based effluent limits for that toxic chemical using numeric Basin Plan objectives (or other protective numeric criteria when numeric objectives are lacking) that will protect aquatic life beneficial uses. When recent chronic Whole Effluent Toxicity (WET) data indicate the "reasonable potential" to exceed the Basin Plan narrative toxicity objective, the L. A. Board must establish water quality based effluent limitations for either chronic toxicity or for the pollutant(s) causing the toxicity.

The L. A. Board must conduct a second public notice when changes to tentative permits are "substantial," or when permit changes cannot reasonably be considered a "logical outgrowth" of public comments received during the comment period. The L. A. Board's major permit modifications must be public noticed and subject to appeal procedures. This includes changes to permit monitoring programs which result in less stringent permit conditions. Also, in accordance with case law, the L. A. Board's expired permits may not be modified. These issues may be of State-wide concern in addition to those State-wide issues discussed in Appendix A.

Two of the six permits reviewed in depth by EPA that were issued by the L. A. Board with pollutant effluent limits did not require monitoring for those pollutants; the L.A. Board must ensure that all permit effluent limits require monitoring. NPDES permits and related information need to be submitted by the L. A. Board to EPA.

COMPLIANCE

Strengths

The L. A. Board has an excellent review and tracking program to assess compliance of its 44 major and 260 minor NPDES permittees. The overall inspection and sampling coverage of NPDES permitted facilities is good, and generally meets EPA requirements. The L. A. Board's quarterly violations summary report, which includes a listing of all violations (not just NPDES) and is prepared for submittal to its Board, is useful, and the L. A. Board is commended for including this report on its internet site, an excellent way to convey compliance information to the public. The new data system (SWIM, formerly know as ERIS) that the L. A. Board developed to replace the State-wide data system (the Waste Discharger System) is outstanding,

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and is expected to be a major step forward in data management for the entire State. The L. A. Board is to be commended for its leadership in data management in support of the State-wide program. The L. A. Board's tracking, follow-up, and review process of Discharge Monitoring Reports (DMRs) is excellent, and staff is very knowledgeable of the compliance status of the permittees. EPA's review of selected field notes indicate that staff are knowledgeable about inspection techniques and the inspections are thorough.

Required Changes

State-wide Issues

The L. A. Board's inspection coverage generally meets EPA requirements. However, State-wide, compliance assessment at NPDES major and minor facilities is not adequate. State-wide issues include use of appropriate sampling methods, adequacy of field inspection notes, and depth of on-site review. Notes taken during inspections must be retained by inspectors at all the RWQCBs for at least three years. Copies of inspection reports of major permittees, as well as copies of responses from permittees about violation follow-up, must be sent by all RWQCBs to EPA.

The QNCRs submitted by the RWQCBs need improvement in quality and content. The L. A. Board must report all appropriate violations on the QNCR, including violations of non-monthly averages.

Issues Specific to the L. A. Board

The L. A. Board needs to implement a solution to the BKK Corporation technical noncompliance problem. Since the review, EPA notes that the L. A. Board rescinded BKK's permit and enrolled it under the General Industrial Storm Water Permit.

The L. A. Board needs to implement proper compliance evaluation of report submittals. At a minimum, the language in all future permits needs to be reflective of the way reports will be tracked for compliance. The L. A. Board is now implementing practices to ensure that permittees are notified of their respective "date certain" report due dates, and the ERIS/SWIM system is now being used to track report receipt.

The SWRCB needs to be notified by the L. A. Board of changes in inspection schedules if they will result in less than 100 percent inspection coverage of majors for the inspection year, to afford EPA the opportunity to conduct remaining inspections if so desired.

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STORM WATER COMPLIANCE AND ENFORCEMENT

Strengths

The L. A. Board has knowledgeable and dedicated staff that are accomplishing an admirable level of work in spite of a large universe of regulated facilities and a severely limited resource base. The Ventura County permit implementation and compliance program is well implemented, with an adequate level of Board oversight; the L. A. Board nominated this permit for an EPA national award. The L. A. Board staff inspected 100 percent of active construction sites within the Ventura watershed at least once prior to the onset of the 1997-98 rainy season, and re-inspected approximately 80 percent during the rainy season. The L. A. Board is to be commended for this pre/post rainy season inspection protocol. Los Angeles Coastal Watershed Unit staff have started to perform in-depth audits of individual co-permittees under the Los Angeles County MS4 program. The L. A. Board is to be commended for developing and implementing an improved storm water inspection tracking system in September 1998.

Required Changes

State-wide Issues

A greater inspection presence in the storm water program for both industrial and construction sites needs to be established by all RWQCBs, including the L. A. Board. Activities conducted by the L. A. Board during 1997-98 in the Ventura watershed construction program are a good model for the L. A. Board's other watershed units to strive for. Within the industrial program, the L. A. Board needs to continue and more actively seek out non-filing facilities. EPA recognizes that increased efforts are underway.

Issues Specific to the L. A. Board

The L. A. Board must review and comment upon the Los Angeles County MS4 model program submittals. Without timely Board action, implementation of this MS4 permit is not possible.

PRETREATMENT

Strengths

The L. A. Board is responsible for the regulatory oversight of 11 pretreatment programs. The Board's Pretreatment Compliance Inspections (PCIs), audits, and accompanying reports appear to be complete, including appropriate findings, requirements, and recommendations. The *Self-Monitoring Program Summary Review Sheet* is a comprehensive log which is used by some staff to record pretreatment program reviews, status, and activities. This *Review Sheet* is excellent and recommended for use by all staff.

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Required Changes

State-wide Issues

The SWRCB, the L. A. Board, or some combination of RWQCBs must develop the necessary program expertise in industrial wastewater treatment, the Federal categorical standards and pretreatment regulations, and industrial user permitting and oversight, in order to effectively implement the pretreatment program. State-wide, pretreatment priority and work commitments need to be addressed. The L. A. Board needs to establish procedures to ensure that audits and pretreatment compliance inspections (PCIs) are appropriately scheduled, and that EPA and the SWRCB are notified quarterly of schedule revisions and shortfalls, as required by the Clean Water Act Section 106 annual workplan. State-wide, lack of pretreatment enforcement is of concern, especially where water quality problems exist due to pretreatment noncompliance; the L. A. Board must ensure that pretreatment enforcement activities are conducted, and are timely.

Issues Specific to the L. A. Board

The L. A. Board needs to review quarterly and annual pretreatment reports, in preparation for PCIs and audits, and for submittal of Water Enforcement National Data Base (WENDB) data elements. The L. A. Board needs to ensure that all PCI and audit reports are issued and timely; that adequate and timely PCI and audit follow-up investigation is conducted; and that PCI reports, audit reports, and WENDB data elements are submitted to EPA.

The L. A. Board needs to complete the review of the Burbank local limits and formally approve the limits, as modified if necessary. In response to EPA's formal reviews of the City of Los Angeles local limits, the Board needs to approve these local limits. Also, the Board needs to complete the pretreatment program review and approval process for the Ventura Waterworks District No. 1 (Moorpark facility).

ENFORCEMENT

Strengths

Since the time this review was conducted, EPA notes a significant improvement in both the number of enforcement actions taken and the penalties assessed by the L. A. Board. This is based on the Board's intention to issue 140 ACLs and to assess over $1.5 million in fines this year.

The L. A. Board's establishment of the Water Quality Standards and Enforcement Unit in August 1997 is commended. This Unit increases and improves the Board's focus and efforts on enforcement case development. The L. A. Board generally initiates formal enforcement actions to address NPDES violations when warranted, largely in conformance with SWRCB/RWQCB policy, and imposes and collects some civil penalties. Since the time of this review, EPA notes

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that the L. A. Board assessed a record $2.3 million penalty against the City of Thousand Oaks for an 86 million gallon sewage spill, recovering economic benefit. The L. A. Board has adopted a "progressive enforcement approach" in which enforcement actions are generally escalated according to a discharger's response to a previous Board action. Consistent with EPA policy and the Clean Water Action Plan, the L. A. Board is emphasizing enforcement actions for violations due to sewage spills. The L. A. Board has established a sound citizen complaint tracking system, and has also established a binder that contains all enforcement actions available for public review.

Required Changes

State-wide Issues

Penalty actions at all RWQCBs need to comply with applicable State penalty policies. Economic benefit amounts must not be reduced or rescinded as an incentive toward achieving compliance or as an off-set for supplemental environmental projects.

All RWQCBs need to place more emphasis on initiating formal enforcement actions within the storm water program. In particular, industries that are subject to, but that have not yet filed for coverage under, the General Industrial Storm Water Permit should be targeted. EPA acknowledges the L. A. Board's efforts which have resulted in an annual report submittal rate of 90 percent. For the remaining non-submitting facilities, the L. A. Board has been implementing a progressive enforcement strategy that has been effective in bringing facilities into compliance.

Issues Specific to the L. A. Board

The L.A. Board should ensure that all applicable violations are included in the "Report of Violations and Enforcement Actions" so that it complies with the SWRCB Enforcement Policy that all applicable violations are brought to the attention of the Regional Boards. EPA's review determined that staff exercise discretion when determining what violations to include in this report. Board staff should ensure that they send to EPA copies of all relevant enforcement documents related to NPDES major facilities, including Notices of Violation, formal enforcement actions, civil penalty settlement correspondence, civil penalty agreements, referrals for judicial action, and case closures.

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OTHER NPDES PROGRAM SUGGESTIONS

During the conduct of this review of the L. A. Board's NPDES program, EPA identified a number of suggestions for improving their administration of the program. These suggestions are based upon both EPA's experience in implementing the NPDES program and national program perspective. EPA believes these suggestions will result in a more effective program at the L. A. Board. Though not explicitly required by law, regulation, or national policy, EPA urges the L. A. Board to implement the following:

Permits

The L. A. Board should consider encouraging public agencies that develop general public education programs on reduction of discharge of toxic materials to include pesticides in their programs. This could be accomplished by specifically mentioning pesticides in both the *residential public education* and *public agency activities* sections of the MS 4 permits. This would be expected to result in lessening the adverse impact on water quality stemming from routine household use of pesticides. Also, in addition to procedures for evaluating exfiltration from the sanitary sewer, the L. A. Board is encouraged to persuade permittees to include procedures for evaluating malfunctioning septic systems in their programs, as EPA's Part 2 MS4 guidance recommends. The L. A. Board should include each of the annual reporting requirements, as listed in the regulations, in MS4 permits so that permittees will not mistakenly only respond to the specific requirements as set forth in the permit.

To protect beneficial uses: (1) NPDES permits issued by the L. A. Board should contain toxicity conditions which require sensitivity screening for acute toxicity using a vertebrate and an invertebrate test species, and (2) NPDES permits issued by the L. A. Board should contain toxicity conditions which require increased effluent monitoring for toxicity following the measurement of effluent toxicity at critical levels, as denoted by the exceedance of an effluent limit or benchmark where no effluent limit has been established. This approach is similar to existing permit conditions which specifically require increased monitoring when a monthly average effluent limit is exceeded.

To protect beneficial uses and to facilitate water quality based permitting, the L. A. Board should develop an implementation procedure for the chronic mixing zone provision contained in Chapter 4 of the Basin Plan.

Compliance

The L. A. Board should consider establishing an automated system to track its follow-up on citizen complaints and spills. EPA notes that the data system called SWIMS, when implemented, will accommodate this tracking activity.

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The L. A. Board should consider having all inspectors use bound notebooks for note-taking during inspections as contemporaneous, bound notes are potentially of more value in civil and criminal enforcement proceedings.

Pretreatment

All L. A. Board pretreatment program oversight staff should use the *Self-Monitoring Program Summary Review Sheet*.

Enforcement

The L. A. Board's Watershed Units that are responsible for the day-to-day oversight of regulated facilities and the new Enforcement Unit should develop and implement procedures to further improve on-going communication. This will ensure that a facility's total compliance history is considered when developing enforcement cases, and will also ensure that any enforcement strategies are not hindered by lack of other information regarding a facility. All compliance information is relevant and needs to be considered in the development of an enforcement action.

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INTRODUCTION

On June 3 through 5, 1998, the U.S. Environmental Protection Agency, Region 9 (EPA), conducted a review of the Los Angeles Regional Water Quality Control Board's (RWQCB 4) approved National Pollution Discharge Elimination System (NPDES) program. The review was conducted by EPA to assess RWQCB 4's implementation of the NPDES program, in accordance with Federal laws, regulations, and policies, as agreed upon by EPA and California, and described in the following documents:

1. NPDES Memorandum of Agreement between the U. S. Environmental Protection Agency and the California State Water Resources Control Board (September 1989), and
2. Final FY 1995/1996, FY 1996/1997, and FY 1997/1998 Section 106 Workplans.

The EPA review focused on five main NPDES activities: permitting, compliance, pretreatment, storm water, and enforcement, and generally covered the time period from 1995 to 1998. EPA conducted its review by evaluating a representative sample of RWQCB 4's NPDES program files, documents, quarterly and other reports, and by conducting interviews of RWQCB 4's NPDES program managers and staff. The EPA evaluation of RWQCB 4's NPDES program took place both at EPA's offices in San Francisco (document review) and at RWQCB 4's offices in Monterey Park. The EPA review is documented on checklists which correlate with the requirements of the above-listed documents. This report presents the results of EPA's review of RWQCB 4 regarding the approved California NPDES program.

EPA's review participants included the following Region 9 Water Division staff:

Mike Schulz, Associate Director
Robyn Stuber, Environmental Scientist, Permitting Review
Robert Wills, Environmental Engineer, Compliance and Pretreatment Program Review
Jeremy Johnstone, Environmental Engineer, Enforcement and Storm Water Review
Jenée Gavette, Environmental Protection Specialist, Pretreatment Compliance and Enforcement Review
Dyi-You Shieh, Environmental Engineer, Compliance/Enforcement Review
Eugene Bromley, Environmental Engineer, Storm Water Permitting Review
Laurie Kermish, Attorney, from Region 9's Office of Regional Counsel

A draft review report was issued in September 1998, with comments received from the SWRCB on October 30, 1998, from RWQCB 4 dated November 6, and from RWQCB 4 staff on December 1, 1998. All comments have been discussed with the SWRCB and RWQCB 4, and the results of these discussions are incorporated into this final report. We wish to extend our thanks to the staff and managers at RWQCB 4 for their hospitality and cooperation in the conduct of this NPDES review.

OVERVIEW OF THE STATE WATER RESOURCES CONTROL BOARD AND THE REGIONAL WATER QUALITY CONTROL BOARDS

The California State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs) exercise the regulatory and adjudicatory powers of the State of California in the field of water resources. To implement the State's water quality program, a regional or watershed approach to water issues was created in 1949 and greatly expanded in 1969 when the Porter-Cologne Water Quality Control Act was signed into law. Through this regional approach, the State has been divided into nine major watershed areas with the establishment of a RWQCB in each area. The RWQCBs have primary authority and responsibility for implementing four major functions to protect water quality by ensuring the adoption and implementation of water quality control plans--planning, permitting, monitoring, and enforcement.

The SWRCB was created in 1967 to combine into one agency regulatory powers covering both water rights and water quality issues, thus complementing the authority of the RWQCBs. The SWRCB may issue water quality control plans in areas of State-wide significance (i.e., an Ocean Plan, a Bay Delta Plan, a Tahoe Plan) and also ensures consistency through the adoption of State-wide policies. The SWRCB also administers key elements of the Federal Clean Water Act, such as storm water general permitting and the non-point source pollution control program, and conducts oversight of the RWQCBs, including approval of water quality control plans. The SWRCB is authorized to review most actions (or inaction) by the RWQCBs, and to adopt water quality orders when appropriate.

The SWRCB and each of the RWQCBs are headed by Boards consisting of members appointed by the Governor to four-year terms. Each Board is made up of nine volunteers from diverse backgrounds (i.e., wastewater, law, public-at-large, engineering, etc.) to ensure equal representation of each RWQCB's regulated community who are appointed by the Governor to their positions as Board members. The RWQCBs and their appointed Boards each have discrete approval or issuance authorities, as set forth in the attached Table 1.

During the last half of 1997, the SWRCB and RWQCBs added 18 new positions State-wide for enforcement activities. In addition, the SWRCB created the Compliance Assurance and Enforcement (CA&E) Unit to coordinate and evaluate enforcement activities taken State-wide. Key staff were assigned and an organizational structure was identified in each of the nine RWQCBs to assure that enforcement and compliance actions are increased. The CA&E Unit had three major tasks: (1) improve management reporting of compliance assurance and enforcement activities, (2) track the use of the special enforcement staff resources, and (3) develop a strategy to direct State compliance assurance and enforcement activities in the coming years. These three tasks have been completed, and the Compliance Assurance and Enforcement Strategy was issued in June of 1998, about the same time as EPA's review was conducted. The Strategy contains

many recommendations for improving compliance and enforcement activities, many of which are expected to address issues identified in this review.

BACKGROUND AND REVIEW OBJECTIVES

The State of California and EPA have entered into the Memorandum of Agreement (MOA) and annual Clean Water Act Section 106 Workplans to ensure an effective and well-coordinated program of water quality control in California. These agreements delineate the respective responsibilities of California and of EPA for the operation of a cooperative State-Federal NPDES program, including permitting, compliance, and enforcement in accordance with the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act (CWA) of 1987 (P.L. 100-4).

These agreements recognize that the issuance of NPDES permits, conduct of inspections, and issuance of enforcement actions necessary for the protection and enhancement of waters in California are the primary responsibility of RWQCBs, and require that RWQCBs issue permits which are consistent and compatible with the CWA and its regulations and policies. The agreements recognize EPA's substantial interest and oversight role in the issuance of NPDES permits and related enforcement matters, and describe EPA's primary role in providing financial and technical assistance, including policy guidance, to RWQCBs. The agreements also require EPA's and the RWQCB 's full cooperation to promote and conduct an enforcement program capable of providing maximum effectiveness in achieving Federal and State objectives for the regulation of water quality as follows:

1. regulating all discharges subject to the NPDES and pretreatment programs, except those reserved to EPA, in conformance with Federal and State law, regulations, and policy;
2. maintaining technical expertise, administrative procedures, and management control, such that implementation of the NPDES and pretreatment programs consistently conforms to State laws, regulations, and policies;
3. implementing federal program revisions;
4. providing technical assistance to the regulated community to encourage voluntary compliance with program requirements;
5. assuring that no person or entity realizes an economic benefit from non-compliance;
6. maintaining an adequate public file at the appropriate RWQCB Office for each permittee. Such files must, at a minimum, include copies of: the permit application, issued permit, public notice and fact sheet, discharge monitoring reports, all actions, and other pertinent information and correspondence;
7. comprehensively evaluating and assessing compliance with schedules, effluent limitations, and other conditions in permits;
8. taking timely and appropriate enforcement actions in accordance with the CWA, applicable Federal regulations, and State law; and
9. implementing pretreatment program responsibilities.

The agreements also recognize that the SWRCB is responsible for supporting and overseeing the RWQCBs' management of the NPDES and pretreatment programs in California, as follows:

1. evaluating RWQCB performance in the areas of permit content, procedure, compliance, monitoring and surveillance, quality assurance of sample analyses, and program enforcement;
2. providing that the SWRCB shall act on its own as necessary to assure that the program is administered in conformance with Federal and State legislation, regulations, policy, the MOA, and the State annual 106 workplan;
3. providing technical assistance to the RWQCBs;
4. developing and implementing regulations, policies, and guidelines as needed to maintain consistency between State and Federal policy and program operations, and to maintain consistency of program implementation throughout all nine RWQCBs and over time;
5. reviewing decisions of the RWQCBs upon petition from aggrieved persons or upon its own motion;
6. assisting the RWQCBs in the implementation of federal program revisions through the development of policies and procedures;
7. performing any of the functions and responsibilities ascribed to the RWQCBs, and
8. implementing pretreatment program responsibilities.

U.S. EPA and the State of California have been cooperatively engaged in the operation of the approved California NPDES program since 1973. During this time, formal and informal reviews and various EPA oversight activities have been conducted to determine the effectiveness of RWQCB NPDES programs. Though it has been at least five years since EPA has conducted an NPDES program review of a RWQCB, EPA is ultimately responsible to the U.S. Congress and the American public. Thus, EPA needs first-hand knowledge that EPA-approved programs are effective and compliant with all applicable laws, regulations, and policies. This review was conducted to achieve this objective.

This report consists of several components. First is an overview of the RWQCB 4 NPDES program, which briefly describes RWQCB 4's organizational structure relevant to NPDES administration. The results of EPA's review are then presented for each of five areas of the NPDES program: permits, compliance, storm water, pretreatment, and enforcement. Each of these five sections discusses EPA's evaluation of RWQCB 4's NPDES activities, including which actions were reviewed by EPA, and provides EPA's conclusions (strengths and changes required by law, regulation, and/or national policy) for improving administration of RWQCB 4's approved NPDES program, including discussion of program issues of State-wide concern. The sixth section of the report includes EPA's suggestions for improving RWQCB 4's NPDES program.

NPDES PROGRAM OVERVIEW FOR RWQCB 4

The Surface Water Division (SWD), one of three divisions/program offices of RWQCB 4, is responsible for the implementation and operation of RWQCB 4's NPDES program, including permitting, compliance, and enforcement activities for all of its NPDES-permitted facilities. The SWD's Assistant Executive Officer reports to the RWQCB 4 Executive Officer (EO). At the time of the review, the SWD was divided into two sections, Watershed Regulatory and Regional Programs, as illustrated in the attached Table 2. The Watershed Regulatory section was divided into four units, including a data and information management unit and three watershed units--Los Angeles Coastal, Ventura Coastal, and Los Angeles Inland. Watershed Unit staff were individually responsible for all permitting, compliance, and informal enforcement activities related to each NPDES facility to which they are assigned. The Regional Programs Section's Standards and Enforcement Unit was responsible for all formal enforcement actions related to NPDES facilities. The attached Tables 3 and 4 lists RWQCB 4 NPDES-permitted facilities. The attached Table 5 lists the numbers of Notices of Violation (NOVs), Time Schedule Orders (TSOs), Cease and Desist Orders (CDOs), Clean-up and Abatement Orders (CAOs), Administrative Civil Liability Complaints (ACLCs), and penalty amounts proposed, assessed, and collected by RWQCB 4 for Fiscal Years 1995 through 1998.

The SWRCB has developed NPDES program cost factors to serve as the basis for determining NPDES program needs in California; these cost factors should be used in determining RWQCB 4's resource needs in administering all aspects of its NPDES program. It should be noted that California's NPDES program has been historically underfunded, resulting in insufficient resources at all the RWQCBs, including RWQCB 4. Therefore, the RWQCBs shifted priorities and redirected resources, in RWQCB 4's case, through implementation of a watershed management approach (see RWQCB 4 Staffing for the NPDES Permitting Program section of this report). In 1999, the California state legislature recognized that there were inadequate resources to support the NPDES program and provided additional resources state-wide, including RWQCB 4.

RWQCB 4's jurisdiction covers nearly 4,000 square miles, services more than 10 million people and includes approximately 390 surface water body segments, of which 40 percent are recognized as having impaired beneficial uses, including Santa Monica Bay, Los Angeles River, and Malibu Creek. In addition, 11 Publicly Owned Treatment Works (POTWs) in RWQCB 4 receive discharges from industries comprising 50 percent of the total industries in California, accounting for the vast majority of toxics control accomplished in California under the Clean Water Act. RWQCB 4 regulates 44 major and 260 minor NPDES permitted facilities, regulates 345 enrollees under six different general permits, is responsible for 2,600 industrial facilities and 600 construction sites that are subject to storm water regulations, and regulates Ventura and Los Angeles Counties with municipal storm water permits, with 11 and 86 co-permittees, respectively.

STATE-WIDE NPDES PROGRAM NEEDS

EPA's NPDES program reviews conducted to date at RWQCBs 4 (Los Angeles), 5 (Sacramento), and 9 (San Diego) have revealed issues which are applicable throughout the State of California. These issues, as agreed upon by the SWRCB, all nine RWQCBs, and EPA during meetings held in January and February 1999 in Sacramento, are listed below, and discussed in more detail in Appendix A of this report. EPA is working with the SWRCB and the RWQCBs to identify and implement solutions to these State-wide NPDES program needs. These issues are:

- The current lack of State-wide water quality standards for toxic pollutants, and the absence of a plan of implementation for establishing water quality based effluent limits for toxics and whole effluent toxicity, results in NPDES permit issuance problems at the RWQCBs.
- Adoption of NPDES permits containing compliance schedules for water quality based effluent limitations is not allowable, unless an authorizing provision is contained in the applicable water quality control plan.
- Permit fact sheets/statements of basis need to clearly establish that permits are consistent with applicable statutes, regulations, and policy (e.g., reasonable potential, antibacksliding, establishing mixing zones, determining dilution credits, etc.).
- Appropriate receiving water limitations language, for which acceptable model language was recently developed by EPA, the SWRCB, and the California Storm Water Quality Task Force, needs to be included in all forthcoming municipal storm water permits.
- Copies of inspection reports of major permittees, as well as copies of responses from permittees about violation follow-up, must be sent by all RWQCBs to EPA, in accordance with the Memorandum of Agreement (MOA) between EPA and State of California.
- Compliance review of Discharge Monitoring Reports (DMRs) is often not timely, especially for minors.
- The Quarterly Non-Compliance Reports (QNCRs) submitted by the RWQCBs need improvement in quality and content.
- Field presence/compliance assessment at NPDES major and minor facilities is not adequate. Issues include use of appropriate sampling methods, adequacy of field inspection notes, and depth of on-site review.
- A greater inspection presence in the storm water program for both industrial and construction sites needs to be established by all RWQCBs; this program element is significantly under-funded State-wide.
- Pretreatment program expertise, in general, needs to be strengthened State-wide. Industrial user regulation by the State is needed. Industrial user compliance problems, especially when the pretreatment authority is for whatever reason unable to exert authority over the industrial user, must be addressed by the State.

- All RWQCB penalty actions need to comply with EPA and State policies which call for recovery of economic benefit resulting from noncompliance.

PERMITS

RWQCB 4's scope of responsibility for NPDES permit issuance encompasses the following:

• Individual Permits:	44 majors[1]
	260 minors
• General Permits (non-storm water):	six categories (345 enrollees)
• Municipal Storm Water Permits:	Ventura County (11 co-permittees)
	Los Angeles County (86 co-permittees)
• Industrial/commercial storm water Notices of Intent (NOIs):	2,600 industrial/600 construction

EPA Evaluation Procedures

EPA's NPDES permit review consisted of four parts:

1. An in-depth review of a subset of RWQCB 4-issued permits--City of Los Angeles, Donald C. Tillman Water Reclamation Plant (WRP) (tentative permit); City of Simi Valley Water Quality Control Facility (WQCF); Las Virgenes Municipal Water District's Tapia Water Reclamation Facility (WRF); Chevron U.S.A., Inc.'s El Segundo Refinery; and the Los Angeles County Municipal Separate Storm Sewer System (MS4) permit--and a spot check of other individual permits to verify that permits are written in accordance with applicable law, regulations, and policy.
2. A review of the Memorandum of Agreement (MOA) to ensure that requirements are followed and that the MOA accurately reflects the needs of California's approved NPDES program.
3. An on-site review of RWQCB 4's permit files to ensure that administrative records are complete and contain required information.
4. A general review of overall program effectiveness in terms of permit backlog, staffing, training, etc.

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[1] Major municipal discharges have a design flow greater than one million gallons per day (mgd) or an EPA/State-approved industrial pretreatment program. Major industrial discharges are determined based on specific ratings criteria that have been developed by EPA and the State. Minor discharges are all remaining discharges

The NPDES permits selected for in-depth review or that were spot checked were for facilities located in Ventura or Los Angeles Counties. These two counties contain some of the largest concentrations of population and commercial activity in the world. The permits selected for in-depth review were chosen because the facilities are significant major dischargers representing different discharge categories. Also, the permits selected for in-depth review or that were spot-checked reflect water quality-based permitting practices subsequent to the 1994 invalidation of California's Inland Surface Water Quality Control Plan and Enclosed Bays and Estuaries Water Quality Control Plan, and the initiation of RWQCB 4's watershed permitting approach. Tillman WRP and several spot-checked permits were tentative permits under consideration for adoption by the RWQCB 4's Board during its June 1998 meeting. Therefore, any EPA comments on these tentative permits would have been timely for permit reissuance. Subsequent to the exit briefing, EPA objected to provisions of three tentative permits, the Donald C. Tillman WRP; the City of Los Angeles/Los Angeles-Glendale Water Reclamation Plant; and the City of Burbank Public Works Department/Burbank Water Reclamation Plant and Steam Power Plant. In response to EPA's objections, the RWQCB's Board adopted these permits with all required revisions, fully addressing EPA's concerns.

The purpose of the on-site permit file review was to view the administrative records for Tillman WRP, Simi Valley WQCF, Tapia WRF, and El Segundo Refinery. The NPDES permit files that EPA reviewed were current, orderly, and readily available for review.

RWQCB 4 Staffing for the NPDES Permitting Program

While in previous years RWQCB 4 has had an appreciable backlog of expired permits, under the watershed permitting approach (and Watershed Management Initiative, or WMI), permit issuance has been prioritized using a rotating watershed approach. RWQCB 4 has established 11 watershed management areas which are scheduled for permitting activities on a seven-year cycle. This cycle began in 1995, with the Ventura River and Calleguas Creek Watersheds, and will be completed in 2002, with the Los Angeles/Long Beach Harbors and Dominguez Channel Watersheds. The focus of permitting activities by RWQCB 4 during FY 1997/1998 and FY 1998/1999 is the Los Angeles River Watershed.

In the Watershed Regulatory Section (WRS), 12 staff and four supervisors are responsible for all surface water core regulatory activities in 11 watershed management areas, including NPDES permit reissuance. WRS priority activities for FY 1998/1999 include:

- permit reissuance and processing new individual permit applications;
- conducting inspections, tracking violations, and recommending enforcement (as appropriate);
- working with stakeholder groups in "off-year" watersheds on development and implementation of watershed management plans and monitoring programs;

- working with municipal storm water permittees on implementation of MS4 permits; and
- outreach to industrial/construction general storm water permit non-filers, etc.

While most WRS staff are experienced at writing NPDES permits, EPA encourages WRS staff to attend relevant training courses to update and broaden their expertise as training funds become available. At the request of RWQCB 4, Region 9 will be pleased to conduct a one-day whole effluent toxicity (WET) training course at the RWQCB 4 offices during FY 1999.

NPDES Permits--EPA Conclusions

Watershed Management Initiative (WMI) Schedule for Permit Issuance

In FY 1994/1995, RWQCB 4 had a NPDES permit backlog (individual permits including storm water) with nearly 70 percent of their permits requiring reissuance. In 1995, RWQCB 4 implemented its watershed permitting approach in accordance with the WMI, whereby priorities for permit issuance have been established consistent with emphasis on priority watersheds. At the completion of FY 1997/1998, RWQCB 4 is reissuing all permits in accordance with their WMI schedule for permit issuance, with only a few minor permits remaining backlogged. This is a significant accomplishment.

Storm Water Permitting

The Los Angeles County storm water permit (MS4) was reissued in July 1996. EPA was heavily involved in developing the draft permit and endorsed its reissuance. This review utilizes storm water permitting guidance available in 1996, which EPA used at that time to evaluate the reissued permit. The most important component of an MS4 permit is the storm water management program (SWMP). This permit specifies highly detailed and well thought-out requirements for the SWMP. RWQCB 4 is commended for its efforts in the development of these requirements, and for its extensive outreach to interested parties in the development of the SWMP and other permit requirements.

EPA suggests that RWQCB 4 include each of the requirements for an annual report as specified at 40 CFR 122.42(c) in its MS4 permits. Although the Los Angles County MS4 permit requires compliance with 40 CFR 122.42(c), the list of annual reporting components which is included in the permit omits any reference to budget information. A permittee may mistakenly only respond to the specific requirements as set forth in the permit. The suggested change would reduce the chance for such an omission.

EPA suggests that RWQCB 4 consider encouraging public agencies that develop general public education programs on reduction of discharge of toxic materials to include pesticides in their programs - this would be expected to result in lessening the adverse impact on water quality stemming from routine household use of pesticides. Part 2 V.C.1.b.i.aa of the Los Angeles

County MS4 permit omits mention of pesticides in its outline of the residential public education program. EPA recommends that pesticides be specifically mentioned as they are in Part 2.IV.C.4.a for public agency activities.

Also, in addition to procedures for evaluating exfiltration from the sanitary sewer, RWQCB 4 should persuade permittees to include procedures for evaluating malfunctioning septic systems in their programs. EPA's Part 2 MS4 guidance manual recommends that failing septic systems be investigated as a potential source of pollutants in storm water runoff. The Santa Monica Bay EPI study also cited failing septic systems as potential sources of the pathogens which have generated concerns in Santa Monica Bay recreational waters.

In addition, the reissued Los Angeles County MS4 permit provides that the County is to propose "model" programs which, upon approval by the Executive Officer or RWQCB 4's Board, are then to be adopted by the co-permittees. In light of the current problems hindering implementation of the terms of the reissued permit (see discussion on pages 28-30 of this report, Storm Water Compliance Activities), neither EPA nor RWQCB 4 should endorse this type of permit in the future. Any permits which rely on action by the regulatory agency before requirements are triggered may experience similar implementation problems due to the uncertainties of future resources and changing priorities.

Finally, EPA has objected to "precedential" receiving water limits which were adopted by the SWRCB in January 1998, and incorporated into recent MS4 permits (the RWQCB 2 Vallejo and the RWQCB 9 Riverside County MS4 permits). The "precedential" language requires that storm water management plans be designed, implemented, and, if necessary, upgraded to prevent only those exceedances which "cause or substantially (in more than a de minimus amount) contribute to a continuing or recurring exceedance of any applicable water quality standard." EPA believes that receiving water limitations must address all exceedances of water quality standards--not just those that are substantial, continuing, or recurring. The Los Angeles County MS4 permit contains its own unique receiving water limits language which provides that implementation of Best Management Practices (BMPs) required by the permit constitute compliance with receiving water limits. EPA accepted this language when the permit was reissued and has not reconsidered its acceptability since that time. However, the revised receiving water limitation language, which EPA developed with the SWRCB and the California Storm Water Quality Task Force, needs to be included in all forthcoming MS4 permits issued in the State, including those in RWQCB 4.

Application of Secondary Treatment Standards

In response to CWA requirements, EPA has established performance standards for secondary treatment at 40 CFR 133.102 which describe national minimum levels of effluent quality required for five-day Biochemical Oxygen Demand (BOD_5) and Suspended Solids (SS) (both effluent concentration and percent removal from influent) as well as pH. All publicly

owned treatment works with permits reviewed or spot checked by EPA contained appropriate secondary treatment standards, including some which were more stringent than the Federal minimums in order to fully protect beneficial uses. In some of these permits, while EPA found that secondary treatment standards for effluent pH were not contained in the permit's "Discharge Limitations" section, they were found in the "Standard Provisions, General Monitoring, and Reporting Requirements" section ("Attachment N" to these permits).

Application of Effluent Limitations Guidelines

National effluent limitations guidelines set forth effluent limits for industrial categories (i.e., refineries, foundries, etc.). The guidelines, as developed by EPA, represent a reasonable level of wastewater treatment which is within the economic means of specific categories of industrial facilities. The industrial permit reviewed by EPA (El Segundo Refinery) included all effluent limits required by applicable effluent limitations guidelines. WRS staff are commended on their implementation of the guidelines given the complex circumstances surrounding the discharge of process and non-process wastewaters by this facility (described in the fact sheet and permit findings).

Implementation of Water Quality Standards

EPA recognizes that a number of the RWQCB 4 water quality standard permitting problems that are discussed below are partially attributable to the lack of State-wide water quality standards for toxic pollutants. EPA's promulgation of the California Toxics Rule (CTR) and the State's adoption of the Inland Surface Waters and Enclosed Bays and Estuaries Plan's Implementation Policy are expected to address this issue for most constituents. In the interim, to ensure permits are issued as required, all RWQCBs should refer to EPA's *Technical Support Document* and to fact sheets and permits that will be provided as examples by the SWRCB, as discussed in Appendix A, State-wide issues.

The regulations at 40 CFR 122.44(d) require that numeric water quality based effluent limitations be established for discharged pollutants which cause, have the reasonable potential to cause, or contribute to an exceedance of narrative or numeric water quality standards. In the permits reviewed in-depth or spot checked, fact sheets/permit findings indicate that "reasonable potential" served as the basis for many of the water quality based effluent limitations. Fact sheets/statements of basis need to clearly detail: (1) the procedure by which reasonable potential was determined for the discharge (e.g., the statistical approach from EPA's *Technical Support Document for Water Quality-based Toxics Control (Technical Support Document*; TSD) for water quality-based toxics control, percent of objective approach detected in effluent approach, etc.); (2) which effluent pollutants were evaluated for reasonable potential; and (3) other important characteristics of effluent pollutant data sets evaluated for reasonable potential (e.g., operational time period which data represent, size of data set, etc.). In addition, EPA recommends that the WRS use a consistent approach for determining reasonable potential.

In some of the permits reviewed in depth, EPA found that some water quality based effluent limitations were not based on appropriate numeric criteria, for example: (1) for protection of an "aquatic life" beneficial use, effluent limits were established based on less stringent Maximum Contaminant (MCL) objectives, rather than on more stringent protective aquatic life criteria; and (2) while daily maximum limits were established based on available acute aquatic life criteria, no monthly average limits were established based on available chronic aquatic life criteria. EPA also found that the averaging period for a given numeric objective/criterion was not consistently applied to permits. For example, the averaging period for the same objective should not be "daily maximum" in one permit and "monthly average" in another permit. EPA suggests that the WRS develop procedures to ensure consistent implementation of objectives/criteria with respect to beneficial use protection, reasonable potential determinations and effluent limit averaging period (see also EPA's *Technical Support Document*, Chapter 3, Effluent Characterization, and Chapter 5, Permit Requirements).

In all inland surface water discharge permits reviewed in depth or spot checked, the metals effluent limits were not properly developed. The "form" required for most metals effluent limits in these permits was the "dissolved" form rather than the "total recoverable" form, as defined in 40 CFR 136. Expressing water quality objectives/criteria for metals in the dissolved form poses the need to "translate" between dissolved and total recoverable metal forms for the purpose of NPDES permits, so that total recoverable effluent limits for metals can be established as required by 40 CFR 122.45(c). This translation is necessary because chemical conditions in ambient waters frequently differ substantially from those in effluents, and there is no assurance that effluent particulate metal will not dissolve after discharge.

A "translator" is the ratio of dissolved to total recoverable metal concentrations as an effluent mixes with the receiving water, and is used to estimate the concentration of total recoverable metal in an effluent (i.e., the wasteload allocation based on a TMDL or estimated using a water quality objective/criterion) that equates to a dissolved instream concentration equal to the dissolved objective/criterion[2]. This "total recoverable" wasteload allocation represents the maximum release that will still allow attainment of the "dissolved" objective/criterion. Total recoverable metal effluent limits are established based on this wasteload allocation. Where site-specific "translators" have not been developed, EPA recommends using criteria conversion factors as default translators. EPA notes that Water Effect Ratios (WERs) should be used to

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[2] $WLA_t = \frac{[C_t(Q_u+Q_e)-Q_uC_u]}{Q_e}$, where

WLA_t	=	total recoverable wasteload allocation
C	=	concentration
C_t	=	total recoverable instream concentration equal to the dissolved criterion (i.e., "dissolved" criterion ÷ translator)
Q	=	flow
u	=	upstream
e	=	effluent

develop site-specific objectives/criteria, not "dissolved" effluent limits, as allowed in RWQCB 4 permit conditions. Also, in some permits, EPA found that hardness values for the "effluent" rather than the "ambient water body" were used to determine applicable water quality criteria for some metals. EPA recommends that ambient hardness values be used to determine applicable water quality criteria for metals.

Implementation of Whole Effluent Toxicity

EPA recognizes that a number of the whole effluent toxicity (WET) permitting problems discussed below are partially attributable to the lack of a State-wide implementation policy for toxicity. Progress in addressing these issues is expected once the State adopts its Implementation Policy for toxics standards for inland surface waters, enclosed bays, and estuaries of California.

EPA recommends that permits require sensitivity screening using a vertebrate and an invertebrate for acute toxicity test species, as recommended in the *Technical Support Document*. Most permits reviewed in depth or spot checked required both acute and chronic WET monitoring, and most inland surface water discharge permits required chronic toxicity monitoring in the receiving water. While these permits required sensitivity screening using a vertebrate, invertebrate, and alga for chronic toxicity test species, they did not require sensitivity screening using a vertebrate and an invertebrate for acute toxicity test species. In addition, permits should require that all WET and receiving water testing be conducted using the most current acute and chronic toxicity test methods manuals approved under 40 CFR 136.

In all inland surface water discharge permits reviewed or spot checked, EPA found that chronic toxicity limits (using the Basin Plan's narrative objective for toxicity) are applied to the "receiving water" rather than the "effluent." Subsequent to the EPA review exit briefing, further analyses indicated that for at least one of these facilities where there had been chronic toxicity problems with the effluent (Tillman WRP; see Enforcement Case Studies section of this report), the permit was reissued with receiving water limits for chronic toxicity rather than effluent limits. EPA wishes to emphasize that receiving water limits for chronic toxicity may be used to complement, but cannot substitute for water quality-based effluent limits for chronic toxicity when required by "reasonable potential" regulations at 40 CFR 122.44(d)[3]. Where effluent data for chronic toxicity demonstrate the "reasonable potential" to exceed the Basin Plan's narrative objective for toxicity, regulations at 40 CFR 122.44(d) require water quality based effluent limits for chronic toxicity or for the pollutant(s) causing the toxicity. Where receiving water limits for chronic toxicity are warranted, EPA recommends that the permit clearly establish the distance downstream of the effluent discharge within which chronic toxicity may occur, consistent with Basin Plan chronic toxicity mixing zone provisions (<250 feet).

[3] While this statement is made in the context of our review of implementation of whole effluent toxicity in permits, it also applies to any pollutant discharged under the NPDES

Several permits reviewed in depth contained "Toxicity Identification Evaluation (TIE) trigger" conditions following exceedances of 1 TUc in the receiving water; EPA supports using the magnitude of 1 TUc as a benchmark for triggering investigation into the causes of toxicity and as the basis for establishing water quality-based limits for chronic toxicity when reasonable potential is demonstrated.

All permits reviewed in depth contained "TIE trigger" conditions based on the observance of "consistent toxicity," or toxicity observed over "n" consecutive months; however, these permits did not require accelerated effluent monitoring for toxicity following the exceedance of an effluent limit or benchmark where no effluent limit has been established. Where accelerated effluent monitoring is not required following such an exceedance, EPA is concerned that critical levels of effluent toxicity may continue for an unacceptably long period of time before any action to reduce effluent toxicity is required by the permit. This is of special concern where effluent monitoring requirements for toxicity are infrequent in relation to the frequency of exceedances that trigger action by the permittee to reduce or identify the cause(s) of toxicity. Region 9's recommendations for accelerated effluent monitoring following the measurement of effluent toxicity at critical levels may be found in the *Regions 9 and 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs* (Denton and Nerves, 1996).

Finally, understanding that ammonia, in conjunction with other toxicants, may be responsible for toxicity at critical levels, EPA recommends that standard permit language specifying the conditions under which ammonia can be removed during a toxicity test be updated. When the suspected toxicant is ammonia, recommended procedures for identifying and evaluating the cause(s) of toxicity are outlined in pages 5-7 through 5-9 of *Regions 9 and 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs.*

Other Permitting and Documentation Requirements

In two of the six permits reviewed in depth (Simi Valley WQCF and Tapia WRF), effluent or receiving water monitoring requirements for some pollutants with effluent limits or receiving water limits (e.g., chronic toxicity) were omitted from the monitoring and reporting program. This should not be allowed. Despite these two cases, EPA believes that only on occasion do these types of omissions occur and that it is routine procedure for RWQCB 4 to include monitoring requirements for all pollutants with effluent limits and for ambient toxicity when a permit contains a toxicity "receiving water limit" or "receiving water objective".

The fact sheet (or statement of basis) and supporting documentation serve as the primary basis for defending a permit in an administrative appeal and, ultimately, in the courts. Regulations at 40 CFR 124.8 require that fact sheets contain the following information

- the type and quantity of pollutants treated and discharged;
- a summary of the basis for the tentative permit conditions including reference to applicable statutory or regulatory provisions and appropriate supporting references to the administrative record; and
- any calculations or other necessary explanations of the derivation of specific effluent limits and conditions.

The fact sheets prepared by the WRS provide summary explanations for permit requirements, and special attention is given to the source document for water quality based effluent limitations. Additional explanation detailing the basis for requiring water quality based effluent limitations needs to be provided in the fact sheet, including reasonable potential procedures and the methodology used to implement water quality objectives/criteria as effluent limits.

For some permits reviewed in depth, fact sheets/permit findings did not indicate whether antibacksliding requirements at Section 402(o) of the CWA (see also 40 CFR 122.44(l)) and Section 303(d) of the CWA have been met. Permit fact sheets/statements of basis need to clearly document whether antibacksliding requirements are met.

In general, fact sheets/permit findings for the reviewed and spot checked permits did not appear to establish whether the permit is consistent with State and federal antidegradation policies. The fact sheet/statement of basis needs to document whether the permitted discharge is consistent with State and federal antidegradation policies.

As discussed above, the need for greater specificity in fact sheets is a State-wide issue. To ensure permits are issued as required, all RWQCBs should refer to EPA's *Technical Support Document* and to fact sheets and permits that will be provided as examples by the SWRCB, as discussed in Appendix A, State-wide issues.

Standard Permit Conditions

Standard permit conditions in 40 CFR 122.41 and 122.42 delineate the legal, administrative, and procedural requirements for all NPDES permits. Standard conditions may be incorporated into the permit verbatim, or by specific reference to the regulations. The use of standard conditions helps ensure uniformity and consistency of all NPDES permits issued by authorized States or EPA. NPDES permits adopted by RWQCB 4 contain these standard permit conditions in the "Standard Provisions, General Monitoring, and Reporting Requirements" section (NPDES permit "Attachment N"). EPA reviewed "Attachment N" dated April 21, 1997, and concluded that it should be updated with respect to violation penalties, sludge conditions, and reporting requirements. EPA also noted that at least two different versions of "Attachment N" (i.e., April 21, 1997 and May 14, 1997) are being used by the WRS. Because attachments

may change over time, EPA requests that signed major permits sent by RWQCB 4 to EPA include all attachments, including "Attachment N."

Memorandum of Agreement (MOA)

The MOA requirements are generally followed by RWQCB 4. While tentative permits seem to be provided to EPA for review within time frames specified under the MOA, all permit attachments and fact sheets/statements of basis do not accompany these submittals. EPA requests that the practice of sending to EPA all permit attachments and fact sheets for major permits be reinstated.

EPA has noted that during the public comment period, as RWQCB 4 enters into negotiations with the permittee and other interested parties, substantial changes may be made to the noticed tentative permit prior to adoption by the RWQCB's Board. In accordance with 40 CFR 124.10 and case law which establishes the standard for re-initiating public notice, a second public notice may be required when RWQCB 4 changes to tentative permits are "substantial" or when the changes can not reasonably be considered a "logical outgrowth" of the public comments received during the public comment period. While this can be a fact-specific judgment call, re-noticing may avoid procedural challenges and bring out any lingering substantive concerns. This issue may be of State-wide concern, in addition to those State-wide issues discussed in Appendix A.

Permit Modification Procedures

In its review, EPA noted that permit modifications, especially modifications to monitoring and reporting programs which result in less stringent permit conditions, are frequently made by the Executive Officer. Many of these modifications are major modifications as defined by regulations at 40 CFR 122.62, and must be properly public noticed and subject to appeal procedures (see also the MOA). During the in-depth review of major permits, EPA found that RWQCB 4 improperly modified one of the permits subsequent to its expiration date (Tillman, Order No. 91-102 issued 9/9/91, as modified in 1998). Improper modifications undermine permit enforceability, therefore, EPA requires that all permit modifications be conducted in accordance with applicable regulations. This issue may be of State-wide concern, in addition to those State-wide issues discussed in Appendix A.

Compliance Schedules

As established by 40 CFR 122.47 and applicable case law, NPDES permits cannot contain compliance schedules for achieving water quality based effluent limitations unless an authorizing provision is included in a State's water quality standards. The primary water quality standards document in the Los Angeles Region is the Basin Plan. The Basin Plan contains an authorizing compliance schedule provision for ammonia objectives, but not for other effluent

pollutants routinely regulated in NPDES permits. Several permits reviewed in depth or spot checked by EPA contained unauthorized compliance schedules for water quality based effluent limitations without an authorizing provision in the applicable water quality control plan. EPA requires that when an authorizing compliance schedule provision is not included in the applicable water quality control plan, the permit must be issued with a companion enforcement order containing appropriate compliance schedule conditions. This was one of the bases for EPA's subsequent objections to the reissuance of permits for Tillman WRP, Glendale WRP, and Burbank WRP and SPP. EPA's concerns were fully addressed by RWQCB 4, and Time Schedule Orders (TSOs) for these facilities have been issued. This issue is of State-wide concern, as discussed in Appendix A.

EPA CONCLUSIONS SUMMARY--PERMITS

Strengths

1. In FY 1994/1995, RWQCB 4 had a NPDES permit backlog (individual permits including storm water) with nearly 70 percent of their permits requiring reissuance. At the completion of FY 1997/1998, RWQCB 4 was reissuing all permits in accordance with its workplan schedule for permit issuance, with only a few minor permits remaining backlogged. This is a significant accomplishment.
2. RWQCB 4 is coordinating the setting of water quality standards with NPDES permitting using a rotating priority watershed approach.
3. RWQCB 4 is establishing water quality based effluent limitations for toxic chemicals in NPDES permits when the RWQCB finds that a discharge causes, has the reasonable potential to cause, or contribute to an exceedance of narrative or numeric water quality objectives (i.e., has "reasonable potential").
4. Where reasonable potential is established and numeric water quality objectives for toxic chemicals are lacking, RWQCB 4 is using the Basin Plan narrative toxicity objective in conjunction with protective numeric criteria for toxic chemicals (e.g., NTR criteria, Gold Book criteria, etc.) to establish water quality based effluent limitations which in most cases ensure protection of beneficial uses. Lack of State-wide water quality standards for toxic pollutants is a State-wide issue, discussed below.
5. RWQCB 4's NPDES permit files were orderly, current, and readily available for review.

Required Changes--State-wide Issues

1. The current lack of State-wide water quality standards for toxic pollutants, and the absence of a plan of implementation for establishing water quality based effluent limits for toxics and whole effluent toxicity, results in NPDES permit issuance problems at all the RWQCBs, including RWQCB 4. EPA Promulgation of the California Toxics Rule (CTR) and the State's adoption of the Inland Surface Waters and Enclosed Bays and Estuaries Plan's Implementation Policy are expected to address this issue for most

constituents. In the interim, to ensure permits are issued as required, all RWQCBs should refer to EPA's *Technical Support Document* and to fact sheets and permits that will be provided as examples by the SWRCB. During the period prior to adoption and implementation of the CTR and the toxic standards for inland surface waters, enclosed bays, and estuaries, all RWQCBs should develop a permitting process to ensure consistent establishment of water quality based effluent limits using Basin Plan objectives and other protective numeric criteria. In addition, during the period prior to adoption and implementation of Total Maximum Daily Loads (TMDLs) for 303(d) listed waters, all RWQCBs should develop a permitting process which ensures consistent establishment of water quality based effluent limits for discharges to 303(d) listed waters without TMDLs where discharges are found to contain pollutants causing or contributing to non-attainment.

2. Adoption of NPDES permits by the RWQCBs containing compliance schedules for water quality based effluent limitations is not allowable (in accordance with 40 CFR 122.47 and applicable case law [i.e., Star-Kist Caribe, Inc., NPDES Appeal No. 88-5]) unless an authorizing provision is contained in the applicable water quality control plan (e.g., Basin Plan, Ocean Plan, etc.) EPA requires that when an authorizing compliance schedule provision is not included in the applicable water quality control plan, the permit must be issued with a companion enforcement order containing appropriate compliance schedule conditions. RWQCB 4's Basin Plan contains an authorizing compliance schedule provision for ammonia objectives, but not for other effluent pollutants routinely regulated in NPDES permits. Several RWQCB 4 tentative permits reviewed in depth or spot checked by EPA contained unauthorized compliance schedules for water quality based effluent limitations without an authorizing provision in the applicable water quality control plan. EPA's concerns were fully addressed and Time Schedule Orders (TSOs) for these facilities were issued by RWQCB 4 to meet this requirement.

3. All RWQCBs including RWQCB 4 need to ensure that permit fact sheets/statements of basis clearly establish that permits are consistent with applicable statutes, regulations, and policy (e.g., reasonable potential, antibacksliding, establishing mixing zones, determining dilution credits, etc.). Along with summary explanations, RWQCB 4's fact sheets need to provide additional explanation detailing the basis for requiring water quality based effluent limitations, including reasonable potential procedures and the methodology used to implement water quality objectives/criteria as effluent limits.

4. Appropriate receiving water limitations language, for which acceptable model language was developed by EPA, SWRCB, and the California Storm Water Quality Task Force, needs to be included in all forthcoming municipal storm water permits from all the RWQCBs, including RWQCB 4.

Required Changes--RWQCB 4

1. In accordance with 40 CFR 122.45(c), RWQCB 4 must establish metals effluent limits in the "total recoverable" form rather than the "dissolved" form.

2. In accordance with 40 CFR 122.44(d), where recent toxic chemical effluent data indicate the "reasonable potential" to exceed the Basin Plan narrative toxicity objective protecting aquatic life beneficial uses, RWQCB 4 must establish water quality based effluent limits for that toxic chemical using numeric Basin Plan objectives (or other protective numeric criteria when numeric objectives are lacking) that will protect aquatic life beneficial uses. For example, a MCL objective should not be used to protect aquatic life beneficial uses where aquatic life criteria are available and more stringent than the MCL.
3. In accordance with 40 CFR 122.44(d), when recent chronic WET data indicate the "reasonable potential" to exceed the Basin Plan narrative toxicity objective, RWQCB 4 must establish water quality based effluent limitations for either chronic toxicity or for the pollutant(s) causing the toxicity.
4. In accordance with 40 CFR 124.10 and case law which establishes the standard for re-initiating public notice, RWQCB 4 must conduct a second public notice when RWQCB 4 changes to tentative permits are "substantial" or when permit changes can not reasonably be considered a "logical outgrowth" of the public comments received during the comment period. This issue may be of State-wide concern, in addition to those State-wide issues discussed in Appendix A.
5. In accordance with 40 CFR 122.62, RWQCB 4's major permit modifications must be public noticed and subject to appeal procedures. This includes changes to permit monitoring programs which result in less stringent permit conditions. EPA notes that this issue may be of State-wide concern, in addition to those State-wide issues discussed in Appendix A.
6. In accordance with applicable case law, RWQCB 4's expired permits may not be modified (Tillman). EPA notes that this issue may be of State-wide concern, in addition to those State-wide issues discussed in Appendix A.
7. In accordance with 40 CFR 122.44(i), permits issued by RWQCB 4 with pollutant effluent limits must require monitoring for those pollutants.
8. NPDES permits and related information need to be submitted by RWQCB 4 to EPA in accordance with the MOA.

COMPLIANCE

EPA Evaluation Procedures

Activities conducted at EPA prior to the June 1998 RWQCB 4 office visit included the review of data (obtained quarterly from the State's Waste Discharger System (WDS) data system) in EPA's Permits Compliance System (PCS) data system, review of the quarterly non-compliance reports (QNCRs) submitted by RWQCB 4 from FY 1995 through 2nd quarter FY 1998, and review of the self-monitoring reports (SMRs) for the same period.

Field activities at the RWQCB 4 office included interviews with the unit chiefs (also referred to as "seniors") in the Watershed Regulatory Section (WRS) and 11 other staff of the WRS, review of files maintained by the staff, and review of staff inspection notebooks. Subsequent to the field review, supplemental information was gathered from telephone conversations with one of the above and two additional staff members.

WRS staff are responsible for all activities from permitting through compliance and informal (and occasionally formal) enforcement. Therefore, it was not possible to estimate the resources utilized in individual program activities such as inspections or SMR review.

Compliance Tracking--Procedures

RWQCB 4 has developed and is piloting a new data system, the Environmental Reporting Information System (ERIS, now known as SWIM), to replace the existing State-wide WDS. ERIS/SWIM has expanded capability as compared to WDS in terms of programs it can handle, ease of use, and ready expansion of data fields. ERIS/SWIM is also designed to receive electronic data submission from dischargers and automatically compare submitted data to requirements, thus eventually relieving staff from doing manual compliance determinations.

SMRs and other reports required by NPDES permits are received and date-stamped at a central location. The receipt date is entered into ERIS/SWIM and the report is routed to the appropriate senior; the senior then routes it to the staff responsible for the facility. The staff reviews the reports and, exercising discretion, prepares a Level 1 letter (signed by a senior) if the report is inadequate. The staff will also generate a Level 1 letter in the case of non-receipt of a due report; it is expected that ERIS/SWIM will generate non-receipt letters in the future after due dates are coded. See the Enforcement Procedures section of this report for discussion of "Levels".

Monitoring files are kept at the individual staff person's office. The staff reviews the SMRs using the actual permit or a summary sheet as a compliance reference, and enters information about the review (date, violations, etc.) onto a SMR summary review sheet (orange sheet kept on top of the SMRs in the monitoring file). For violations which warrant action other than a telephone call, a Level 1 or Level 2 letter (EO signature level, similar to a Notice of Violation) is prepared and routed up to a senior for review and transmittal to the facility, or a recommendation for Level 3 action (formal enforcement, which includes clean-up and abatement orders (CAOs), cease and desist orders (CDOs), administrative civil liability complaints (ACLCs), and civil and criminal litigation) is routed up to a senior for review/transmittal to the Standards and Enforcement Unit for action. On occasion, depending upon workload, WRS staff will prepare the Level 3 action.

All outgoing correspondence, regardless of signature level, is accompanied by a green mail checklist sheet which serves as the route slip/concurrence sheet for the document and is

routed to/through the unit and section chiefs. The mail checklist is stored in a central location for approximately three months after the document is signed. If no problems occur with the document, the mail checklist is recycled.

Telephone conversations with permittees are recorded on a Record of Communication form and are filed in the facility correspondence file. This includes "dings" for minor violations when the staff person decides that a Level 1 letter is not warranted. Phone complaints received from the public are normally handled by staff responsible for the facility and the complaints are written up on a *Spill/Complaint Report* form. Follow-up is documented on the form which is then filed in the correspondence file. If the complaint is about a storm water problem which normally would be handled by a municipal separate storm sewer system (MS4) program, the complaint is forwarded to the MS4 agency for follow-up. Currently, RWQCB 4 is entering records of spills and complaints into its violation and enforcement tracking system and are included in the EO's report to RWQCB 4's Board. However, the current system does not accommodate automated tracking to ensure that follow-up is accomplished. EPA notes that the State-Wide Information Management System (SWIMS), when implemented, can accommodate automated tracking of follow-up

Monthly, WRS staff members give information to the unit chiefs on SMRs received and reviewed, with highlights of problems noted. The unit chief includes this information in a monthly report to the WRS section chief. Quarterly, WRS staff also prepares a form regarding all violations noted (all programs, not just NPDES), actions taken, and other information. The completed forms are given to the permit coordinator who is responsible for a number of tracking systems and reports for violations, spills, enforcement actions, and public information requests. The permit coordinator consolidates the violations information into a quarterly violations summary report which is sent to the EO as an attachment to the quarterly report. This report is made available to the public on the RWQCB 4 web site (http://www.swrcb.ca.gov/~rwqcb4).

Quarterly, WRS staff prepares the Quarterly Non-Compliance Report (QNCR) for each of their assigned facilities, as necessary. The permit coordinator compiles each individual QNCR into one report and sends it to EPA. Questions from EPA regarding content are referred to the appropriate staff person.

Compliance Tracking--Conclusions

The monitoring files reviewed by EPA were complete, well organized, and the summary review sheets were completed promptly. The WRS staff interviewed by EPA had a good knowledge of the compliance status of the facilities for which they were responsible. There is little chance that non-reporting can occur without action or that noncompliance will be unobserved. There are some problems, however, which need correction in the reporting of noncompliance.

Some of the staff are not entering certain violations on the forms which comprise RWQCB 4's quarterly violations summary report, the QNCR, or both. In some cases, staff may be using discretion in deciding that the violations are not important enough to report. This is counter to the intent of the report. Discretion can be factored in at the actions part of the report, but all violations should be reported. In one case, BKK Corporation, staff was making compliance determinations based on an interpretation of the permit rather than the permit itself. The metals limits in the 1991 permit did not state what form (total, total recoverable, dissolved) the limits took. Without such delimitation, the plain meaning is total metals. It is not proper to factor in discretion when determining compliance. RWQCB 4 needs to implement a solution to the BKK Corporation technical noncompliance problem. Since the review, EPA notes that RWQCB 4 rescinded BKK's permit and enrolled it under the General Industrial Storm Water Permit.

In another case, Ventura RCSD-Santa Paula, no information was provided on the QNCR for this facility even though it was in significant noncompliance (SNC) with BOD limits for the October 1997 through March 1998 period. The staff person said that it was not included because the information regarding noncompliance had been forwarded to the Standards and Enforcement Unit for action. The facility still should have been reported as SNC on the QNCR.

A potential problem observed was the way in which reports from the permittees are being tracked. The date that a report is physically received at the RWQCB 4 office is the official logged date for compliance purposes. However, a review of RWQCB 4 permits indicates that most, if not all, reporting requirements are phrased as "transmitted" or "submitted" without definitions being provided for these terms. The plain meaning of these terms is "sent." Thus, rather than track by receipt date, the WRS should be tracking against "sent" or postmarked date. This is hard to do, as few reports are sent certified mail and postmarks are often illegible or missing. However, enforcement could be compromised by using the wrong triggering date. RWQCB 4 has implemented procedures to ensure that permittees are notified of their respective "date certain" report due dates. The ERIS/SWIM system is now being used to track report due dates and receipt.

The WRS has experienced some difficulties in the preparation of the QNCR, especially since 1996, when EPA added non-mouthly averages to the coverage. Neither the permit coordinator responsible for the QNCR nor staff have had training on preparation of the QNCR and none were familiar with the 1996 coverage expansion. Adequate preparation of the QNCR (quality and content) is of State-wide concern, as discussed in Appendix A, State-wide issues.

Inspections--Procedures

Each WRS inspector provides the WDS coordinator with a schedule of inspections to be accomplished during the upcoming inspection year (July 1 through June 30). The scheduled dates are entered into WDS and serve as a reference for future accomplishment reports.

Inspections are generally conducted without notice or with a one-day notice to all facilities, except for Department of Defense facilities (which require additional pre-notice) and power plants (which need enough notice to arrange for an environmental representative to be at the facility). Almost all of the annual inspections of major facilities are sampling inspections.

The inspector sets up the automatic sampler for the effluent sample on the first day of the inspection, conducts the inspection, and retrieves the 24-hour composite sample on the second day. A sample of the influent, when needed, is obtained by splitting a sample taken by the permittee. Samples are delivered, using chain-of-custody procedures, to the State laboratory in Los Angeles for analysis. The State lab provides the sample bottles (with preservatives, if necessary, already in the containers) and cleans the automatic samplers after use.

Inspection findings are recorded either in a bound notebook or on loose-leaf paper during the inspection. The inspectors check the standard items during the inspection, including facility site review, operations and maintenance, records, and reporting and compliance schedules. Laboratory analytical procedures are not evaluated as part of the inspection as the permits require the use of State-certified labs for self monitoring and analysis. Compliance with EPA sludge regulations is also not normally evaluated, with the exception of the Tapia wastewater treatment plant where sludge problems have been observed.

Once back at the office, the inspector completes the Facilities Inspection Report (SWRCB Form 001). The report usually does not contain any narrative description of the findings of the inspection unless non-compliance was observed; an exception to this may be if it was the inspector's first visit to the facility. The inspector may wait for the sampling results to come back from the State lab (usually one month) or may indicate "pending" on Form 001. A copy of Form 001 is then sent to RWQCB 4's WDS coordinator for data entry. After data input, the WDS coordinator indicates by a check mark on Form 001 that the data has been entered and keeps the form in a file. When the lab results are received, information about compliance or non-compliance is written on the form and the form is filed by the inspector in the facility inspection file. The lab results are also filed in the inspection file. It is left to staff discretion whether or not this information is submitted to the WDS Coordinator for entry into a "comment" field of the WDS system. The notes from the inspection may or may not be retained, depending upon the inspector and whether notes were taken on bound or loose-leaf paper.

When non-compliance is noted, either during the inspection or as a result of sample analysis, a narrative report is added to Form 001 and the report is sent to the permittee by cover letter (usually Level 1; see the Enforcement Procedures section of this report for discussion of Levels) requiring that the permittee explain the reasons for noncompliance and the actions taken to prevent recurrence. Depending upon the response, the inspector may recommend escalated action.

The APM, in Chapter 4, states that inspections conducted to fulfill EPA requirements will be documented using both Form 001 and EPA Form 3560-3, and that for majors the latter EPA Form will be sent to EPA. The inspectors do not complete the EPA Inspection Report Form 3560-3 for any inspections as EPA told the State that Forms 001 and 3560-3 contain basically the same information, so completion of the latter is not necessary. Copies of inspection reports have not been sent to EPA since 1992 when inspection data started being entered into WDS. The APM also states that copies of inspection reports will be sent to the facilities inspected, whereas RWQCB 4 only sends a report to facilities if violations are noted during the inspection. As of the time of this review, RWQCB 4 had not sent copies of inspection reports to the SWRCB for approximately two years.

Quarterly, the WDS coordinator prepares a report for each inspector which compares the inspection schedule in WDS with accomplishments. Copies of the quarterly reports are sent to the seniors and the section chief. This serves as a reminder to staff regarding remaining workload and also as a reminder to submit Forms 001 for data entry.

Inspections--EPA Conclusions

RWQCB 4 is doing a good job in conducting NPDES inspections. During inspection years (IYs) 1995 through 1997, 126 of 132 scheduled inspections of major facilities were conducted, for a 95 percent completion rate. This is very close to the regulatory requirement of 100 percent coverage [40 CFR 123.26(e)(5)]. Of these 126 inspections, 80 percent were sampling inspections which significantly exceeds the minimum requirement. One inspection was missed during IY 1995, none were missed during IY 1996, and five were missed during IY 1997. Of the latter IY, four were missed because of increased emphasis on permitting in that particular watershed, and the other facility was inspected the first month in the following inspection year. However, even though it was known that the inspections would not be conducted, no information regarding commitment changes was provided to the SWRCB and, therefore, to EPA. This eliminated EPA's opportunity to increase the coverage to 100 percent if it chose to do so, by conducting the inspections with EPA staff or contractors.

With regard to minor facilities, RWQCB 4 inspected over 97 percent of the facilities during the five-year period IY 1993 through IY 1997, which meets the EPA policy requirement of inspecting minor facilities at least once during the five year life of each permit.

Although detailed inspection reports are not routinely prepared, a review of selected field notes indicates that staff are knowledgeable about inspection techniques and the inspections are thorough. On-the-job inspector training is supplemented by formal training, such as training by sampler manufacturers, when available. Having ready access to a State lab for sample containers and cleaned samplers is a considerable asset in lessening the workload involved in sampling inspections.

Inspection reports of major facilities are not being sent to EPA as required by the MOA. For EPA to maintain its oversight role, general knowledge is needed of on-going violations and of the State and permittee actions regarding those violations. Thus, receiving copies of inspection reports which note violations is important. Also important is receiving copies of report transmittal letters which detail the action needed by the permittee as well as copies of the responses from the permittees. For inspections where no violations were noted, there is no additional information about the inspection other than what is contained in Form 001 which is entered into WDS. As this WDS data is subsequently transferred to PCS where it is available to EPA, EPA considers the inspection report to have been "sent" to EPA, and the requirement of the MOA is satisfied. This issue is of State-wide concern, as discussed in Appendix A, State-wide issues.

EPA has no requirement that reports for inspections with no violations observed should be sent to the permittee. While all EPA guidance indicates that inspection reports are normally sent to the permittees, RWQCB 4 may choose to do otherwise. The primary purpose served by sending such a report, other than courtesy, is to provide the permittee with an official record that an inspection was conducted and that no violations were found. Balanced against this would be the time involved for the additional replies and whether sufficient information may have been provided to the permittee by the inspector during the closeout interview. Regardless, inspectors should be careful to complete the portion of Form 001 which indicates which compliance areas were observed/evaluated during the inspection, and note which areas were not evaluated. This minimizes the possibility of a permittee claiming, should violations be found later, that the inspector had observed and determined facility compliance with all compliance areas.

Inspectors' use of loose-leaf paper rather than bound notebooks to record field observations is of some concern, but more troubling is that some inspectors do not keep field notes of inspections conducted where no violations are found. 40 CFR 123.26 requires that "Investigatory inspections shall be conducted, samples shall be taken and other information shall be gathered in a manner that will produce evidence admissible in an enforcement proceeding or in court". Reasonable implementation of this regulation calls for records retention for at least three years. The field notes will support findings in an inspection report as well as oral testimony because these records are the actual record of the inspection and contemporaneous recordings of observations. The notes also serve as the primary evidence in any action that may be taken. For example, a permittee may request inspector's notes of inspection findings to defend itself against an enforcement action. This issue is of State-wide concern, as discussed in Appendix A, State-wide issues. Common practice for inspectors is to keep their notebooks for their entire career. Using bound notebooks with numbered pages, with care taken so that all pages are accounted for (including, where appropriate, marking pages or portions of pages "deliberately left blank"), is the "gold standard" of note taking for field inspectors, and is strongly encouraged.

EPA CONCLUSIONS SUMMARY--COMPLIANCE

Strengths

1. RWQCB 4 has an excellent review and tracking program to assess compliance of its 44 major and 260 minor NPDES permittees. Inspection coverage of both major and minor permits is good and generally meets EPA requirements. Inspections of majors almost always includes sampling which exceeds EPA's requirements. The system developed for scheduling and reporting inspections provides a good tool for tracking accomplishments/work to be done.
2. The tracking, follow-up, and review process of SMRs is excellent, and staff is very knowledgeable of the compliance status of the permittees. The files are complete and easy to access, even though being kept at individual work stations. RWQCB 4's quarterly violation summary report is an excellent means for keeping management up-to-date on compliance, and making it available on the Internet is an excellent way to convey compliance information to the public.
3. The new ERIS/SWIM data system will be a great step forward in data management for the State of California. RWQCB 4 is to be commended for its leadership in data management in support of the State-wide program.
4. EPA's review of selected field notes indicate that staff are knowledgeable about inspection techniques and the inspections are thorough.

Required Changes--State-wide Issues

1. RWQCB 4's inspection coverage is generally adequate. However, State-wide, field presence/compliance assessment at NPDES major and minor facilities is not adequate. Issues include use of appropriate sampling methods, adequacy of field inspection notes, and depth of on-site review. Notes taken during inspections must be retained by inspectors at all the RWQCBs for at least three years, as required by 40 CFR 123.26
2. Copies of inspection reports of major permittees, as well as copies of responses from permittees about violation follow-up, must be sent by all RWQCBs to EPA, in accordance with the Memorandum of Agreement (MOA) between EPA and the State.
3. The QNCRs submitted by the RWQCBs need improvement in quality and content. RWQCB 4 must report all appropriate violations on the QNCR, including violations of non-monthly averages, in accordance with 40 CFR 123.45 and EPA guidance.

Required Changes--RWQCB 4

1. RWQCB 4 needs to implement a solution to the BKK Corporation technical noncompliance problem, per 40 CFR 122.45(c) and 40 CFR 123.45. Since the review, EPA notes that RWQCB 4 rescinded BKK's permit and enrolled it under the General Industrial Storm Water Permit.

2. RWQCB 4 needs to implement proper compliance evaluation of report submittals, as required by 40 CFR 123.45(a)(2)(ii)(D). At a minimum, the language in all future permits needs to be reflective of the way reports will be tracked for compliance. RWQCB 4 is now implementing practices to ensure that permittees are notified of their respective "date certain" report due dates, and the ERIS/SWIM system is now being used to track report receipt.
3. The SWRCB needs to be notified by RWQCB 4 of changes in inspection schedules if they will result in less than 100 percent inspection coverage of majors for the inspection year (July 1 through June 30), in accordance with the MOA, to afford EPA the opportunity to conduct remaining inspections if so desired.

STORM WATER COMPLIANCE AND ENFORCEMENT

EPA Storm Water Evaluation Procedures

EPA's storm water compliance review consisted of two parts: (1) interviews and discussions with RWQCB 4 staff and management to discuss activities, priorities, resources issues, and other challenges, and (2) a review of selected files at RWQCB 4's offices. In particular, the Los Angeles County and Ventura County MS4 program files were spot checked for purposes of completeness, and for RWQCB 4 action on permittee submittals.

Storm Water Staffing

RWQCB 4 staff are responsible for tracking dischargers' compliance with the following storm water permits: two municipal storm water program permits covering the Counties of Los Angeles (with 86 co-permittees, including Los Angeles County) and Ventura (with 11 co-permittees, including Ventura County), both issued by RWQCB 4, and two General Permits, issued by the SWRCB, one each regulating storm water discharges from industrial and construction sites. Regarding these latter two permits, there are approximately 2,600 and 600 facilities/sites, respectively, that are subject to these two permits within RWQCB 4's jurisdiction.

As of the time of this review, RWQCB 4 received five person years from the SWRCB to implement the storm water program, including oversight of municipal, industrial, and construction permit compliance. Storm water compliance resources are distributed within each of the WRS's watershed units, as well as in the Standards and Enforcement Unit. At the time of this review, 1.5 person years were allocated within the Los Angeles Coastal Unit for oversight of the Los Angeles County MS4 program alone. This allocation includes an estimated 0.75 person years expended in support of on-going litigation with the City of Long Beach, which filed suit against RWQCB 4 in connection with issuance of the Los Angeles County MS4 permit. RWQCB 4 estimates that they require significantly more resources to properly implement their responsibilities in regard to the storm water program, and have submitted requests to the

SWRCB for the additional resources. Storm water staffing levels is a State-wide concern, as discussed in Appendix A, State-wide issues.

Storm Water Compliance Activities

WRS compliance activities in the municipal storm water program include review, comment, and approval, as appropriate, of submittals made pursuant to permit requirements. WRS staff also spend a significant portion of their time involved in periodic outreach and management meetings with co-permittees and other regulated entities (industrial facilities). In 1997-98, the WRS committed to evaluate 10 co-permittees program submittals for compliance with the Los Angeles MS4 permit conditions[4]. However, there was a significant lack of overall progress in implementing the terms and conditions of this storm water permit (as re-issued in July 1996) because the WRS had not reviewed and approved the model program components submitted by Los Angeles County, the lead permittee. The MS4 permit was structured such that a number of storm water management program components (e.g., illicit connections/illegal discharges, industrial/commercial best management practices (BMPs), etc.) are to be proposed by the County as "model" programs. Only after Executive Officer/Board approval of individual model programs are the other co-permittee cities required to adopt the model program within their own jurisdiction. As of the time of the EPA review, five major model programs submitted by the County had not yet been reviewed and/or approved by the WRS, thus hindering overall progress towards achieving permit objectives.

Compliance activities in the industrial storm water program include annual report tracking, review, and referral for enforcement (generally informal) for annual report non-submittal. Staff also responds to telephone and written inquiries from the public, and inspects sites to verify Notices of Termination and Notices on Non-Applicability, to investigate possible non-filers or to determine permit compliance status of permittee facilities. According to RWQCB 4's records, during State FY 1996/1997 (the last complete year that such records were available), WRS staff accomplished, among other things, review of 671 annual reports, issuance of 676 letters for non-submittal of annual reports, inspection of 50 industrial sites, processing of 154 Notices of Termination, and response to 1,113 phone inquiries.

Compliance activities in the construction storm water program largely consist of conducting inspections of construction sites and engaging in occasional outreach activities. For State FY 1997/1998, the Ventura Coastal Watershed Unit established and accomplished the goal of conducting pre-rainy season inspections at each active site within the watershed (approximately 40). Staff also performed follow-up inspections during the rainy season at approximately 80 percent of the active sites.

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[4] Co-permittees are required to comply with the requirements of the last (1990) permit until such time as individual elements under the re-issued (1996) permit go into effect.

Storm Water Compliance--EPA Conclusions

RWQCB 4 storm water program staff are both very knowledgeable and dedicated. They accomplish a great deal in spite of a resource base that is both severely underbudgeted and diverted from compliance activities due to the litigation brought by the City of Long Beach. Oversight of the Los Angeles County MS4 program has been adversely affected by this diversion of staff. Oversight of the Ventura County MS4 program appears to be adequate. Staff working in the Ventura Coastal Unit admirably conducted a significant number of inspections of construction sites prior to and during the past rainy season.

Going into the review, EPA was particularly concerned about the lack of compliance oversight of the Los Angeles County MS4 program. Overall progress under the terms and conditions of the storm water permit had been severely hindered due to the inability of RWQCB 4 to review/approve model program components submitted by the County as the lead permittee. Since the NPDES permit is structured such that compliance with permit requirements is dependant upon this RWQCB 4 action, EPA believed that it was important that RWQCB 4 find the means to provide a prompt and thorough review of model program components as submitted. Since the time of the review, EPA was able to assist by providing contractor resources to RWQCB 4 to help in the review of some of the outstanding model program component submittals. Also, to its credit, RWQCB 4 staff have conducted audits of certain individual co-permittee city storm water management programs.

Within the industrial and construction program areas, RWQCB 4 needs to establish a greater field presence, both to provide an appropriate level of compliance oversight of permitted facilities and sites, and to identify entities that are operating without having filed for appropriate permit coverage. This latter point is important both as an equity issue and also as a possible source of future budgetary resources for RWQCB 4's storm water staff, as a portion of permit filing fees are returned to the RWQCB from the SWRCB in the form of storm water program person years. EPA remains concerned about the lack of resources for implementation of the storm water program State-wide, as discussed in Appendix A, State-wide issues.

Finally, RWQCB 4's storm water files are generally both voluminous and very well organized. At the time of this review, the inspections tracking system was limited to gross reporting of statistics, such as the total number of inspections of industrial facilities in a given time period. However, RWQCB 4 has since developed a tracking system to account for individual inspections and dates which was activated on September 1, 1998.

See also the conclusions summaries for permitting and enforcement for additional information on the RWQCB 4 storm water program.

EPA CONCLUSIONS SUMMARY--STORM WATER

Strengths

1. RWQCB 4 is fortunate to have such knowledgeable and dedicated staff working in its storm water program. Staff is accomplishing an admirable level of work given its severely limited resource base.
2. The Ventura County municipal program is well implemented, with an adequate level of oversight by RWQCB 4 staff; RWQCB 4 nominated this permit for an EPA national award.
3. RWQCB 4 staff inspected 100 percent of active construction sites within the Ventura watershed at least once prior to the onset of the 1997-98 rainy season, and re-inspected approximately 80 percent during the rainy season. RWQCB 4 is to be commended for this pre/post rainy season inspection protocol.
4. Los Angeles Coastal watershed unit staff have started to perform in-depth audits of individual co-permittees under the Los Angeles County MS4 program.
5. During the review, the need was identified for a better inspection tracking system, to account for individual inspections and dates rather than just total number of inspections. RWQCB 4 is to be commended for developing and implementing such a tracking system in September 1998.
6. The storm water program's files are voluminous, but well organized.

Required Changes--State-wide Issues

1. A greater inspection presence in the storm water program for both industrial and construction sites needs to be established by all RWQCBs, including RWQCB 4. Activities conducted by RWQCB 4 during 1997-98 in the Ventura watershed construction program are a good model for the other RWQCB 4 watershed units to strive for.
2. Within the industrial program, RWQCB 4 needs to continue and more actively seek out non-filing facilities. EPA recognizes that increased efforts are underway.

Required Changes--RWQCB 4

1. RWQCB 4 must review and comment on the Los Angeles County MS4 permit model program submittals. Without timely RWQCB 4 action, implementation of this MS4 permit is not possible.

PRETREATMENT

EPA Pretreatment Evaluation Procedures

The review conducted at EPA of FY 1995 through FY 1998 records included Discharge Monitoring Reports (DMRs) from all RWQCB 4 approved pretreatment programs. Field activities at RWQCB 4 included review of selected records, including RWQCB 4 and SWRCB quarterly activity reports, RWQCB 4's Watershed Management Initiative (WMI) information, Pretreatment Compliance Inspection Reports (PCIs) and audits, pretreatment-related records for nine of the 11 pretreatment programs as indicated in the attached Table 4, and an interview with the Watershed Regulatory Supervisor.

Pretreatment Staffing

RWQCB 4 is responsible for the regulatory oversight of 11 approved pretreatment programs as listed in the attached Table 4. Pretreatment program oversight is assigned to six WRS staff members according to the watershed and associated permittees for which they are responsible. Each staff member is responsible for overall oversight of one to three pretreatment programs. RWQCB 4's WMI chapter identifies pretreatment inspections and audits as a Category I core activity.

In RWQCB 4, and throughout California, nearly all industrial wastewaters discharge into POTWs under the regulation of pretreatment programs. The 11 pretreatment programs in RWQCB 4 regulate over 50 percent of all significant industrial users (IUs) in California, including mostly large and old facilities, most of which must comply with complicated Federal standards. These programs account for a significant component of the toxics control accomplished in California under the Clean Water Act.

The complexity of the pretreatment program and its importance to RWQCB 4 requires in-depth experience and expertise. Implementation and oversight of the pretreatment program requires a working knowledge of the Federal pretreatment implementation regulations as well as the nearly 30 categories of Federally-regulated industries. For each regulated industry, an understanding is required of Federal rules, development documents which support the rules, industrial processes and methods, and technologies for wastewater treatment and handling. The SWRCB, RWQCB 4, or some combination of RWQCBs must develop the necessary pretreatment program expertise described above, as well as in industrial user permitting and oversight, in order to fulfill the requirements of the APM and to effectively implement the pretreatment program. This issue is of State-wide concern, as discussed in Appendix A

Pretreatment Compliance Tracking

Quarterly and annual pretreatment reports submitted by the permittees are not consistently tracked (receipt) or reviewed by RWQCB 4. Of the nine pretreatment programs reviewed by EPA, only two pretreatment programs' annual and quarterly reports were tracked and reviewed, as indicated by the inclusion of a *Self-Monitoring Program Summary Review Sheet* in the files.

RWQCB 4's report tracking and review process requires change in order to comply with the SWRCB's Pretreatment Program Administrative Procedures Manual (APM). The APM calls for review of quarterly and annual reports, especially for submittal of Water Enforcement National Data Base (WENDB) data elements (see discussion below) and in preparation for PCIs and audits. Consistent tracking and review will ensure report receipt as required by the NPDES permit, as well as indicate Industrial User (IU) compliance status and adequate/inadequate program response and implementation. The *Self-Monitoring Program Summary Review Sheet* is a comprehensive log which is used to record program reviews, status, and activities, and is recommended for use by all RWQCB 4 pretreatment program oversight staff.

Pretreatment PCIs and Audits

The schedule for conducting PCIs and audits is included each year in California's annual CWA Section 106 grant workplan. The WMI documents set forth the following standard for pretreatment audits and inspections: all pretreatment facilities will be audited once during a 5-year period, and for years when an audit is not conducted, a PCI will be conducted. This is compatible with EPA guidance. During FY 1994/1995, four PCIs/audits were scheduled and conducted, but only two reports were issued; during FY 1995/1996, eight PCIs/audits were scheduled, but only two were conducted and had reports issued; during FY 1996/1997, eight PCIs/audits were scheduled, but only three were conducted and had reports issued. RWQCB 4 did not formally revise its PCI/audit schedule, which is required on a quarterly basis by the CWA Section 106 workplan, so that the SWRCB could notify EPA when PCI/audit commitments were not going to be met.

EPA reviewed five PCI/audit reports. This review indicated that the PCI/audits were thorough, including findings from the last PCI/audit, and review and evaluation of legal authority, local limits, IU characterization, control mechanism, compliance monitoring, enforcement program, and program resources. EPA's file review indicated that in only three cases were PCI/audit checklists used to conduct the inspections. While checklist use is not required by the APM, regular use will ensure ongoing consistency and thoroughness in the manner in which PCI/audits are conducted.

PCI/audit reports are complete, including findings, recommendations, and requirements. Of the seven reports issued by RWQCB 4, PCI reports were issued approximately three months after each PCI was conducted; audit reports were issued approximately four months after each

audit was conducted, with the exception of one which was issued three years after the audit. This delay was attributed to RWQCB 4's backlogged permit reissuance activities. The APM and 106 workplan require that PCI reports be completed within 60 days from the inspection, and that audit reports be completed within 90 days from the audit. Three reports were not issued for two audits and one PCI conducted by RWQCB 4 during FY 1994/1995. However, they were reported to EPA as conducted/complete. According to EPA policy, a PCI or audit is not considered "complete" or "conducted" unless a report is issued.

The PCI/audit reports were transmitted to the pretreatment program permittees by letters signed by the watershed unit chiefs. In most cases, a 45-day response from the permittee was requested. There was some follow-up to some reports in the form of correspondence, submittals, and further RWQCB 4 review and evaluation, but this was not the case for all reports. It is also noted that RWQCB 4 has not taken any pretreatment-related enforcement actions (formal or informal) during the three-year review period, even though PCI/audit reports included findings along with "requirements" which the pretreatment permittee needed to implement in order to be in full compliance with pretreatment regulations and requirements. The APM requires that in the event of non-compliance by a discharger, the RWQCB should issued a Notice of Violation (NOV, an informal action) and conduct follow-up investigations.

Copies of PCI reports, audit reports, and completed WENDB forms (for entry into PCS) for PCIs, audits, and annual report reviews are not consistently submitted to EPA in accordance with the 106 workplan.

RWQCB 4 maintains formal files for approximately half of its approved pretreatment program permittees. Of these, most were in good order and current, but in some cases PCI and audit reports were missing and had to be located. Some files included the *Self-Monitoring Program Summary Review Sheet* as described above. RWQCB 4 must establish and maintain complete and current public files for each NPDES permittee's approved pretreatment program.

Pretreatment PCIs and Audits--EPA Conclusions

PCI and Audit Scheduling

RWQCB 4 does not formally revise its PCI/audit schedule on a quarterly basis, as required by the CWA Section 106 workplan, so that the SWRCB can notify EPA when PCI/audit commitments cannot be met. RWQCB 4 needs to establish procedures to ensure that audits and PCIs are scheduled in accordance with WMI principles and that the EPA/SWRCB is notified quarterly of schedule revisions and shortfalls.

PCIs, Audits, Reports, and Follow-up

PCIs, audits, and their reports appear to be complete and include findings, requirements, and recommendations. Most PCI and audit reports are issued three to four months after the inspection, instead of the required two and three month interval. Three reports were not issued for two audits and one PCI conducted by RWQCB 4 during FY 1994/1995, though they were reported to EPA as conducted/complete. PCI and audit reports are transmitted by letter. RWQCB 4 needs to ensure that all PCI and audit reports are issued and timely, that adequate and timely PCI and audit follow-up investigation and enforcement is conducted, and that PCI reports, audit reports, and WENDB data elements are submitted to EPA. Lack of pretreatment enforcement is of State-wide concern, as discussed in Appendix A, State-wide issues.

Pretreatment Files

RWQCB 4 maintains formal files for approximately half of its permittees with approved pretreatment programs for which it has oversight responsibility. Of these, most were in good order and current, though RWQCB 4 needs to establish and maintain complete and current public files for all of its approved pretreatment programs, either in the permittee's facility file or in a separate pretreatment file. The *Self-Monitoring Program Summary Review Sheet* should be completed and included in all pretreatment files.

Pretreatment Program Approvals and Modifications

Program approvals and modifications generally have a lower priority than other RWQCB 4 NPDES activities, and thus have lagged in recent years. No formal approvals/modifications, including approvals of local limits, had been done during the three-year time period covered by this review. Thus, there was a backlog of actions needed (approval of local limits for the City of Los Angeles, and Burbank programs, and approval of a full-level program for Ventura Waterworks District No.1--Moorpark).

PRETREATMENT CONCLUSIONS SUMMARY

Strengths

1. PCIs, audits, and their reports are complete, including appropriate findings, requirements, and recommendations.
2. The *Self-Monitoring Program Summary Review Sheet* is a comprehensive log which is used by some staff to record program reviews, status, and activities. This *Review Sheet* is excellent and recommended for use by all staff.

Required Changes--State-wide Issues

1. The SWRCB, RWQCB 4, or some combination of RWQCBs must develop the necessary program expertise in industrial wastewater treatment, the Federal categorical standards and pretreatment regulations, and industrial user permitting and oversight, in order to fulfill the requirements of the APM and to effectively implement the pretreatment program.
2. State-wide, pretreatment priority and work commitments need to be addressed. RWQCB 4 needs to establish procedures to ensure that audits and PCIs are scheduled in accordance with WMI principles, and that EPA and the SWRCB are notified quarterly of schedule revisions and shortfalls, as required by the annual 106 workplan.
3. Lack of pretreatment enforcement State-wide is of concern, especially where water quality problems exist due to pretreatment noncompliance. RWQCB 4 must ensure that pretreatment enforcement activities are conducted, as described above, and are timely.

Required Changes--RWQCB 4

1. RWQCB 4 needs to review quarterly and annual pretreatment reports, in preparation for PCIs and audits, and for submittal of WENDB data elements as required by the MOA.
2. RWQCB 4 needs to ensure that all PCI and audit reports are issued and timely; that adequate and timely PCI and audit follow-up investigation is conducted; and that PCI reports, audit reports, and WENDB data elements are submitted to EPA, in accordance with the MOA and the APM.
3. RWQCB 4 needs to complete the review of the Burbank local limits and formally approve the limits, as modified if necessary. In response to EPA's now completed formal reviews of the City of Los Angeles local limits, RWQCB 4 needs to approve these local limits. Also, RWQCB 4 needs to complete the pretreatment program review and approval process for the Ventura Waterworks District No. 1 (Moorpark facility).
4. RWQCB 4 needs to ensure that all records for all of its approved pretreatment programs are filed as required by the MOA.

ENFORCEMENT

EPA Evaluation Procedures

EPA's NPDES enforcement review consisted of three parts:

1. A review of the Memorandum of Agreement (MOA), applicable portions of the SWRCB's Administrative Procedures Manual [Water Quality Enforcement Policy (Resolution No. 96-030, as amended by Resolution 97-085) and "Guidance to Implement the Water Quality Enforcement Policy"], the Regional Board's Enforcement Strategy

(Order No. 97-005) and implementing guidance, and applicable portions of recent CWA Section 106 Workplans.

2. A review of case files on a subset of recent enforcement actions to verify that appropriate procedures are being adhered to.
3. A review of a selection of other NPDES permitted facility files based upon a screening of discharger self monitoring reports (SMRs) to determine how the WRS responds to violations.

Enforcement Procedures

RWQCB 4's enforcement process to ensure discharger compliance is provided in the SWRCB's Administrative Procedures Manual (APM), Water Quality, Chapter 6, which consists of the SWRCB's Water Quality Enforcement Policy (Resolution No. 96-030, as amended by Resolution No. 97-085) and "Guidance to Implement the Water Quality Enforcement Policy," dated April 1996 and amended September 1997. In March 1997, RWQCB 4 adopted Order No. 97-005, which formally adopted the SWRCB enforcement policy as its own.

According to the SWRCB's "Guidance to Implement the Water Quality Enforcement Policy," enforcement cases may be initiated from any of the following means: (1) review of SMRs, (2) compliance inspections, (3) direct facility reporting, (4) complaints, (5) file review, and/or (6) interagency notifications.

The Water Quality Enforcement Policy sets forth specific types of violations that are to be considered for possible enforcement action by the RWQCBs:

1. major NPDES facilities in Significant Non-Compliance (SNC) with Technical Review Criteria (TRC) per 40 CFR 123.45;
2. major NPDES facilities in SNC of monthly average effluent limitations in any four months in a six month period per 40 CFR 123.45;
3. any incidence of acute toxicity which violates Waste Discharge Requirements (WDRs), Basin Plans, or other provisions of law;
4. violations of narrative toxicity standards contained in WDRs or Basin Plans due to chronic toxicity;
5. violations of prohibitions contained in WDRs, Basin Plans, or enforcement orders;
6. spills (unauthorized discharges);
7. failure to submit reports;
8. violations of compliance schedule milestones;
9. failure of a POTW to implement its approved pretreatment program, and/or
10. failure to comply with terms and conditions of a storm water permit.

In taking an enforcement action, the SWRCB's Guidance to Implement the Water Quality Enforcement Policy specifies that the following types of actions are available:

1. Informal Enforcement
   - Telephone contact/follow-up letter
   - Notice of Non-Compliance Letter
2. Time Schedule Orders (TSO)
3. Notices to Comply
4. Cease and Desist Order (CDO)
5. Cleanup & Abatement Orders (CAO)
6. Modification or Rescission of WDR
7. Administrative Civil Liability (ACL)
8. Referrals for Judicial Action
   - Attorney General
   - District Attorney

In establishing its own enforcement strategy to implement the requirements of Resolution 96-030, RWQCB 4 has developed what it refers to as a "progressive enforcement policy" in which enforcement actions are generally escalated according to a discharger's response to a previous RWQCB 4 action. RWQCB 4 reserves its ability to bypass lower threshold actions if the nature of a particular set of violations so warrants. Under its progressive enforcement policy, RWQCB 4 has identified the following levels of enforcement:

Level 1: warning letters (Notices of Non-Compliance letters), issued by the section/unit chief;
Level 2: formal Notice of Violation, issued by the EO;
Level 3: administrative enforcement actions, issued by the EO (CAOs) or pursuant to Board Order;
Level 4: referrals for judicial enforcement made pursuant to Board Order

Enforcement matters had been handled within each of the respective programmatic or watershed units. However, in August 1997, the Executive Officer (EO) established a new Standards and Enforcement Unit (SEU) within the Surface Water Division, which, among other things, is responsible for the development and pursuit of all of the formal enforcement actions that are recommended to the EO or to RWQCB 4's Board for issuance. Originally a team of two plus a supervisor, the SEU had six staff at the time of this review, including a supervisor and one staff person who is dedicated to matters relating to the industrial storm water program. "Informal" enforcement--the drafting of violation letters and Notices of Violation--is still largely left to the individual WRS project officer for a given facility.

Enforcement Action Case Studies

Enforcement case files of six major NPDES permitted facilities were reviewed by EPA, in accordance with the NPDES program review checklists developed for this review and the APM. The files were selected from among the 18 actions forwarded to EPA in May 1998, and were selected so as to review one each of several different types of formal actions. EPA also reviewed facility files for three NPDES major facilities, for which enforcement had not been taken but which appeared to merit consideration due to the nature of violations reported in SMRs. The results are summarized below.

Order 95-020, Administrative Civil Liability Complaint (ACLC), Village Properties Co

RWQCB 4 issued an ACLC on April 21, 1995, for violations of the California General Construction Activities Storm Water NPDES Permit (NPDES Permit No. CAS000002). Specifically, the ACLC alleged failure to develop and implement a Storm Water Pollution Prevention Plan (SWPPP), failure to develop and implement a monitoring program, and discharge in a manner which caused, or threatened to cause, a condition of pollution, contamination, or nuisance on at least 19 days. The ACLC cited a total maximum civil liability of $17,824,000, and recommended that RWQCB 4's Board impose an administrative civil liability in the amount of $226,200, with $26,200 ($15,000 penalty plus $11,200 staff costs) to be made due and payable, and the remaining $200,000 to be suspended, conditioned upon the discharger's compliance with the terms and conditions of the General Permit. The ACLC estimated an economic benefit of non-compliance (cost savings) in excess of $105,000, although the recommended cash penalty of $15,000 would not recover it. Village Properties (Baldwin Co.) filed for bankruptcy protection sometime after issuance of the ACLC. In subsequent discussions, RWQCB 4 agreed to settle for $35,000. There was nothing in the files dated later than February 1996 which indicated whether or not the penalty was paid. Discussions with RWQCB 4 and SWRCB staff indicated that a decision was made to not pursue the penalty through the bankruptcy process.

Order No. 95-115, Cease and Desist Order, Ojai Valley Sanitary District

RWQCB 4's Board adopted this CDO on August 21, 1995. The purpose of the Order was to extend the final date for compliance with effluent limits from July 1, 1996, to January 1, 1998. The discharger had been under a CDO establishing a final compliance date since May 21, 1990 (Order No. 90-063). The original July 1, 1996, date was the result of a previous CDO (Order No. 90-063, amended in 1992 to extend the original compliance date from July 1993 to July 1996). Order No. 95-115 also required compliance with interim milestone dates. A review of the file indicated that all interim milestone dates were complied with as reported by the discharger, and that final compliance was achieved with dedication of a new treatment facility in October 1997. When RWQCB 4 adopted the renewal order (Order No. 96-04) for Ojai Valley, that Order had a provision rescinding the CDO Order No. 90-063 which had been amended by Orders No. 92-093 and No. 95-115.

Order No. 97-136, Time Schedule Order (TSO), Las Virgenes Municipal Water District (MWD), Tapia Water Reclamation Facility (WRF)

This TSO was issued at the time of the reissuance of the facility's NPDES Permit (No. CA0056014) on November 3, 1997, because the facility was unable to immediately comply with new effluent limits established for nitrate (as N) or dichlorobromomethane. The TSO set interim effluent limits for these constituents, and also established a time schedule that required the discharger to investigate measures to reduce concentrations of these two constituents in its effluent. The TSO also set a final compliance date of October 10, 2002, for compliance with the permitted effluent limit for nitrate. However, there was no final date for compliance with the

effluent limit established for dichlorobromomethane, instead stating that the interim limit "is in effect until such time as the Discharger has completed the study required in this Order and has implemented the necessary measures to reduce the pollutant in the discharge, and the Executive Order (sic) has determined that the constituent limit is achievable." Las Virgenes MWD has complied with milestone dates that had passed as of the time of the EPA review. WRS committed to the discharger that it would review the December 1997 workplans by the end of January 1998; there was no record in the file that the WRS review had been done.

Order No. 98-016, Cleanup and Abatement Order (CAO), City of Thousand Oaks, Unit W Sewer Interceptor

RWQCB 4's EO issued this CAO on February 9, 1998, to address a February 3, 1998 washout of the City's Unit W sewer interceptor during a storm event and the resulting discharge of raw sewage into the South Fork of Arroyo Conejo. The Order required an assessment of the extent of contamination resulting from the spill; implementation of a cleanup and abatement program; submittal of a written report on the February 3, 1998 event; submittal of a long term corrective action plan; and monthly status reports. According to the EO's Report of April 13, 1998 (prepared for the RWQCB's Board meeting), the discharger had complied with all of the requirements of the CAO to that date. RWQCB 4 also issued an ACLC seeking payment of penalties for the February 3, 1998 event. (EPA is aware of the results of the Board hearing on this ACLC, which occurred after this review was completed.)

City of Los Angeles, Tillman Water Reclamation Plant (WRP)

This facility's file was selected for review based upon a review of Discharge Monitoring Reports (DMRs) at EPA's office that indicated a recent history of violations of the chronic toxicity limit. The facility violated the limit for chronic toxicity during the following months: January through March, May through July, September, and November 1997; and January and March 1998. A review of this facility's files at RWQCB 4's offices revealed that the facility had acknowledged each monthly violation in submitting applicable DMRs. Further, the facility completed a toxicity identification evaluation and toxicity reduction evaluation (TIE/TRE) in February 1998, identifying "seasonal diazanon" as the likely causative agent. A review of staff reports dated 1998 to RWQCB 4's Board did not indicate that the Board had been kept informed of the continuing toxicity violations, but that is perhaps attributable to a clause in the facility's permit stating that if the discharger is implementing a TIE it shall not be considered in violation of the chronic toxicity effluent limit. The discharger requested an alternate, narrative effluent limit. The permit was re-issued in June 1998, and the chronic toxicity effluent limit was replaced with chronic toxicity "receiving water limits" for chronic toxicity, rather than effluent limits (see discussion in this report at NPDES Permitting, Other Permitting and Documentation Requirements). A review of the files also indicated several (approximately five instances during 1995 through 1997) violations of the effluent limit established for residual chlorine. There was no record that violations were reported by staff to RWQCB 4's Board in accordance with

required procedures (the SWRCB's Water Quality Enforcement Policy (Resolution No. 96-030, as amended by Resolution No. 97-085). However, the WRS area engineer assigned to this facility was aware of the violations and stated that the facility was presently undergoing a rehabilitation of its chlorination/dechlorination control system, which is due to be completed in 1999.

Shell Oil Los Angeles Refinery/Carson Plant

This facility's file was also selected for review based upon a review of DMRs at EPA's office that indicated a recent history of violations of the chronic toxicity limit. In July 1997, the facility completed a Phase I TIE Report to address previously recurring toxicity in the bioassay test organism *Selanastrum*. The report identified the ionic nature of the discharge as the root cause of the observed toxicity, and recommended a change in test species to the Fathead minnow. However, the discharger reported violations of the toxicity limit in December 1997 and from January through April 1998 even with the change in test species. Additionally, the facility also reported violations of effluent limits for the following parameters: zinc (February 1998), silver (April 1998), and xylene and toluene (March 1998). There was no record that the violations were reported by staff to RWQCB 4's Board (only the toxicity violations were required to be reported per policy). The WRS staff assigned to this facility were familiar with the violations, and stated that the facility had ceased operating as a petroleum refinery, had changed to use as a bulk distribution plant, and thus now only discharged storm water, no longer having any process wastewater. The facility had, therefore, requested that its NPDES permit be terminated, and that it be placed under coverage of the California General Industrial Activities Storm Water NPDES Permit.

Texaco Refining/Marketing Inc. Los Angeles Plant

This facility's file was selected for review based upon a review of DMRs at EPA's office that indicated a recent history of violations of several effluent limits in 1997 and 1998. The facility had also been identified in a report by a local environmental group[5] as having had a significant number of spills (this assertion was not independently verified in the course of the EPA program review). A review of the facility file indicated that RWQCB 4 had in the past sent a number of informal and formal notices of violation (Levels 1 and 2) for the above-referenced effluent limit violations. Discussions with RWQCB 4 staff indicated that an enforcement action was being developed against this facility for the above-noted effluent limit violations, demonstrating a good example of RWQCB 4's progressive enforcement approach. However, the SEU indicated that they were not considering the facility's spills history in their assessment, and were unaware of the extent of this history, stating that this information had not been provided to

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5 Omission Accomplished: The Lack of a Regional Water Board Enforcement Program, 1992-1997, Heal the Bay, January 1998

them. Additionally, during the EPA site review, a draft renewal NPDES permit was mailed by the WRS without the knowledge of the SEU.

Enforcement--EPA Conclusions

EPA's review found that RWQCB 4 enforcement activities largely meet the requirements of the approved NPDES program. RWQCB 4 has adopted a "progressive enforcement approach" in implementing the SWRCB's Enforcement Policy, although not always followed in the past, in particular regarding the issuance of Level 1 and 2 non-compliance notices. At the time of this review, RWQCB 4 had taken a few formal enforcement actions in the past, and had collected some civil penalties. In August 1997, the EO created the Standards and Enforcement Unit, primarily responsible for initiating and undertaking formal enforcement actions. The number of formal actions has increased significantly since the creation of this unit. Since the time this review was conducted, EPA notes a significant improvement in both the number of enforcement actions taken and the penalties assessed by RWQCB 4, i.e., RWQCB 4 expects to issue 140 ACLs and assess over $1.5 million in fines this year. A summary of formal enforcement actions may be found in the attached Table 5. Also, enforcement files were generally complete and well organized, although most enforcement-related documentation is not being forwarded to EPA, as required by the MOA.

EPA's review found that the following RWQCB 4 enforcement activities require change to comply with applicable regulations and national policy.

Civil Penalties and Economic Benefit

During the review, EPA found that, while RWQCB 4 imposes and collects some penalties, it rarely included an assessment of, nor attempted to recover, the economic benefit of non-compliance in its penalty actions. The need for State enforcement actions to comply with State penalty policies including recovery of economic benefit through penalties is of State-wide concern, as discussed in Appendix A.

However, EPA notes that, since the time of the review, RWQCB 4 assessed a record $2.3 million penalty, which did recover economic benefit, against the City of Thousand Oaks for an 86 million gallon sewage spill. During 1999, RWQCB 4 has also initiated several ACL actions with complaints which appear to include assessment of the economic benefit of non-compliance. RWQCB 4 staff have also attended EPA's training class in BEN, the Agency's computer model for estimating economic benefit, thus providing them with the ability to determine, calculate, justify, and recover economic benefit in a consistent, fair, and equitable manner in accordance with the SWRCB's and RWQCB 4's enforcement and penalty policies and EPA national policy requirements.

EPA also noted during the review that RWQCB 4 has a history of supporting the use of supplemental environmental projects (SEPs) as a major part of its penalty actions. EPA also supports the use of SEPs, to the extent that they are consistent with EPA's "Interim Revised Supplemental Environmental Projects Policy," dated May 3, 1995. In general, EPA's policy states that SEPs may be used as a supplement to a cash penalty, which in turn "should recover, at a minimum, the economic benefit of non-compliance, plus 10 percent of the gravity component, or 25 percent of the gravity component only, whichever is greater" (Revised SEP Policy, Section E.1., page 11).

Also, although ACLCs adequately document the discharger's liability and the justification for the proposed penalty assessment, case files themselves do not appear to contain record of final payment of the ACLC penalty by the violator. This information must be retrieved from a SWRCB database. It would be advisable for the case officer to track the discharger's compliance with requirements to pay the penalty and, where appropriate, compliance with other requirements established as a condition of suspending a portion of the ACLC. These tracking activities should be documented in the files.

Violations Reporting

The SWRCB enforcement policy requires that specific types of violations be reported by RWQCB 4 to its Board. RWQCB 4 accomplishes this requirement with a quarterly "Report of Violations and Enforcement Actions." However, as noted in the case file reviews above, not all of the applicable violations are being brought to the attention of the Board as required. This may be attributable to the fact that the forwarding of violations to the compiler of the quarterly report has largely been left to individual staff's discretion. It is anticipated that this problem will be corrected with the implementation of the new automated database that is under development by RWQCB 4 (ERIS/SWIM), discussed in the Compliance Section of this report, from which the quarterly reports will be compiled in the future.

Final Compliance Dates

In the matter of the Las Virgenes Tapia WRP, one of the six case files reviewed by EPA, the adopted TSO did not contain a final compliance date for the effluent limit set for dichlorobromomethane. RWQCB 4 must ensure that all TSOs, CAOs, and CDOs require compliance with the applicable NPDES permit, establish a final compliance date, and set appropriate interim effluent limits and schedule milestones.

EPA CONCLUSIONS SUMMARY--ENFORCEMENT

Strengths

1. RWQCB 4's creation of and resource commitment to the new Standards and Enforcement Unit is commended, as is the significant improvement in both the number of enforcement actions taken and the penalties assessed by RWQCB 4 this year.
2. RWQCB 4 generally initiates formal enforcement actions (TSOs, CAOs, CDOs) to address NPDES violations when warranted, largely in conformance with SWRCB and RWQCB 4 policy.
3. RWQCB 4 imposes and collects some civil penalties through issuance of ACLCs. Since the time of this review, EPA notes that RWQCB 4 assessed a record $2.3 million penalty, which recovered economic benefit, against the City of Thousand Oaks for an 86 million gallon sewage spill.
4. RWQCB 4 has adopted a "progressive enforcement approach."
5. RWQCB 4 is currently emphasizing enforcement actions for violations due to raw sewage spills. This is consistent with EPA policy and the Federal government's Clean Water Action Plan.
6. RWQCB 4 has established a sound citizen complaint tracking system.
7. RWQCB 4 has established a binder that contains all enforcement actions available for public review.

Required Changes--State-wide Issues

1. Penalty actions at all RWQCBs need to comply with applicable State penalty policies, including recovery of economic benefit resulting from noncompliance. Economic benefit amounts must not be reduced or rescinded as an incentive toward achieving compliance or as an off-set for supplemental environmental projects.
2. All RWQCBs including RWQCB 4 need to place more emphasis on initiating formal enforcement actions in the storm water program. In particular, industries that are subject to, but that have not yet filed for coverage under, the General Industrial Storm Water Permit should be targeted. EPA acknowledges RWQCB 4's efforts which have resulted in an annual report submittal rate of 90 percent. For the remaining non-submitting facilities, RWQCB 4 has been implementing a progressive enforcement strategy that has been effective in bringing facilities into compliance. (See also the Storm Water section of this report.)

Required Changes--RWQCB 4

1. In one instance, an adopted Time Schedule Order did not contain a final compliance date. All formal enforcement actions taken by RWQCB 4 must require compliance by a date certain, and contain appropriate interim effluent limits and schedule milestone dates.
2. RWQCB 4 should ensure that all applicable violations are included in the "Report of Violations and Enforcement Actions" so that it complies with the SWRCB Enforcement Policy that all applicable violations are brought to the attention of the RWQCB 4's Board.
3. RWQCB 4 staff should ensure that they send to EPA copies of all relevant enforcement documents related to NPDES majors, including NOVs, formal actions (TSOs, CAOs, CDOs, and ACLCs), civil penalty settlement correspondence, civil penalty agreements, referrals for judicial action, and case closures.

OTHER NPDES PROGRAM SUGGESTIONS

During the conduct of this review of RWQCB 4's NPDES program, EPA identified a number of suggestions for improving RWQCB 4's administration of the program. These suggestions are based upon both EPA's experience in implementing the NPDES program and national program perspective. EPA believes these suggestions will result in a more effective program at RWQCB 4. Though not explicitly required by law, regulation, or national policy, EPA urges RWQCB 4 to implement the following:

Permits

1. RWQCB 4 should consider encouraging public agencies that develop general public education programs on reduction of discharge of toxic materials to include pesticides in their programs (i.e., pesticides should be specifically mentioned in Section V of the MS4 permit, in addition to Section IV). This would be expected to result in lessening the adverse impact on water quality stemming from routine household use of pesticides. (See page 9.)
2. In addition to procedures for evaluating exfiltration from the sanitary sewer, RWQCB 4 is encouraged to persuade permittees to include procedures for evaluating malfunctioning septic systems in their programs. (See page 10.)
3. The L. A. Board should include each of the annual reporting requirements, as listed in 40 CFR 122.42(c), in MS4 permits so that permittees will not mistakenly only respond to the specific requirements as set forth in the permit. (See page 10.)
4. The WRS should develop procedures to ensure consistent implementation of objectives/criteria with respect to beneficial use protection, reasonable potential determinations and effluent limit averaging period (see also EPA's *Technical Support*

Document, Chapter 3, Effluent Characterization, and Chapter 5, Permit Requirements). (See page 11.)

5. To protect beneficial uses, NPDES permits issued by RWQCB 4 should contain toxicity conditions which require sensitivity screening for acute toxicity using a vertebrate and an invertebrate test species. (See pages 11-12.)
6. To protect beneficial uses, NPDES permits issued by RWQCB 4 should contain toxicity conditions which require accelerated effluent monitoring for toxicity following the measurement of effluent toxicity at critical levels, as denoted by the exceedance of an effluent limit or benchmark where no effluent limit has been established. This approach is similar to existing permit conditions which specifically require accelerated monitoring when a monthly average effluent limit is exceeded. (See pages 14.)
7. To protect beneficial uses and to facilitate water quality based permitting, RWQCB 4 should develop an implementation procedure for the chronic mixing zone provision contained in Chapter 4 of the Basin Plan. (See page 13.)

Compliance

1. RWQCB 4 should consider establishing an automated system to track its follow-up on citizen complaints and spills. EPA notes that SWIMS, when implemented, will accommodate this tracking activity. (See page 21.)
2. RWQCB 4 should consider having all inspectors use bound notebooks for note-taking during inspections as contemporaneous, bound notes are of more value in civil and criminal enforcement proceedings. (See pages 23, 25.)

Pretreatment

1. All RWQCB 4 pretreatment program oversight staff should use the *Self-Monitoring Program Summary Review Sheet*. (See pages 32, 33.)

Enforcement

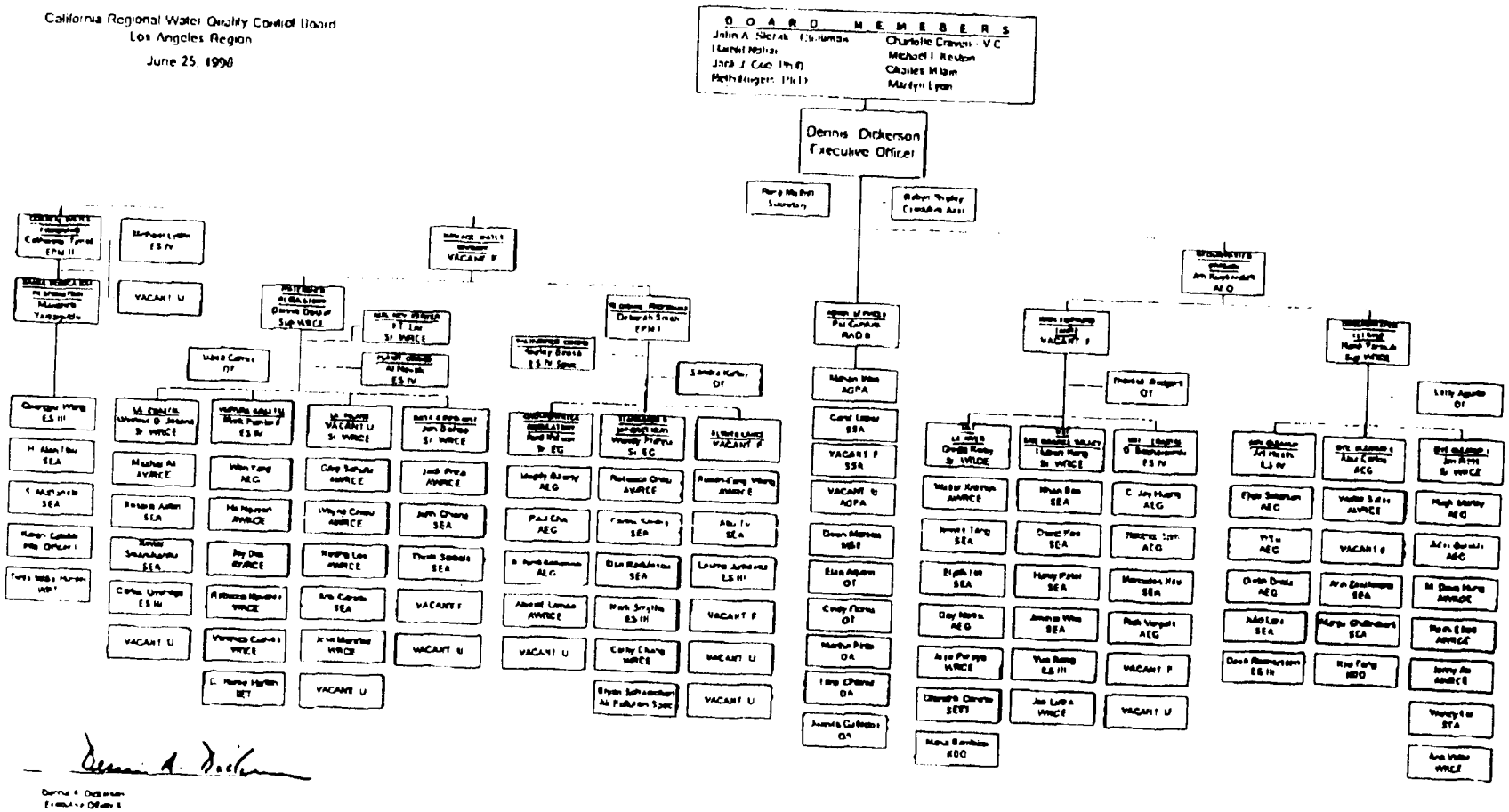
1. The Watershed Units that are responsible for the day-to-day oversight of regulated facilities and the new Enforcement Unit should develop and implement procedures to further improve on-going communication. This will ensure that a facility's total compliance history is considered when developing enforcement cases, and will also ensure that any enforcement issuance strategies are not hindered by lack of other information regarding a facility. As discussed above, in the context of the pending case against Texaco, all compliance information is relevant and needs to be considered in the development of an enforcement action. (See page 40-41.)

Attachment–Table 1 **CALIFORNIA RWQCB AND BOARD AUTHORITIES**	
RWQCB	APPOINTED 9-MEMBER BOARDS
Preparation of NPDES related permits for Board adoption, modification, or rescission	Adoption, modification, or rescission of NPDES related permits
Issuance of Notice of Violations (NOVs), Notice to Comply (NOC) and Cleanup and Abatement Orders (CAOs)	Adoption, modification, or rescission of TSOs, CDOs and referrals to the Attorney General or District Attorney
Preparation of Time Schedule Orders (TSOs), Cease and Desist Orders (CDOs) and recommendations for referrals to the Attorney General or District Attorney for Board approval, modification, or rescission	
Issuance of Administrative Civil Liability (ACL) Complaint (sets forth violations and proposed penalty amount) for Board adoption, modification, or rescission	Adoption, modification, or rescission of ACL Complaints (sets forth settlement amount or measures)
Development of regional plans or policies (i.e., basin plans or operating procedures, etc.) for Board adoption, modification, or rescission	Adoption, modification, or rescission of regional plans or policies (i.e., basin plans or operating procedures, etc.) for ratification by the SWRCB

Attachment—Table 2

California Regional Water Quality Control Board
Los Angeles Region

June 25, 1990



Dennis A. Dickerson
Executive Officer

R0070380

Attachment–Table 3

RWQCB 4 NPDES PERMITTED FACILITIES

Permittee	Permit No.	Major			Storm Water		Minor	
		Ind	Muni	Fed	MS4	Gen	all[1]	Gen
Arco Petroleum Products Co.	CA0000680	✓						
Avalon, City of	CA0054372		✓					
BKK Corporation	CA0059536	✓						
Boeing North American, Inc.	CA0001309	✓						
Burbank, City of Public Works	CA0055531		✓					
Camarillo Sanitary District	CA0053597		✓					
Chevron U.S.A. Inc.	CA0000337	✓						
El Segundo Power, L.L.C.	CA0001147	✓						
Heinz Pet Products Div.	CA0001333	✓						
Las Virgenes MWD	CA0056014		✓					
Long Beach Generation LLC	CA0001171	✓						
Long Beach Naval Complex	CA0003786			✓				
LA City DWP (Harbor Gen.)	CA0000361		✓					
LA City DWP (Haybes Gen.)	CA0000353		✓					
LA City DWP (Scatterg'd Gen.)	CA0000370		✓					
LA City DPW (Hyperion)	CA0109991		✓					
LA City DPW (LA-Glendale)	CA0053953		✓					
LA City DPW (Terminal Island)	CA0053859		✓					
LA City DPW (Tillman)	CA0056227		✓					
LA County SD (JWPCP Carson)	CA0053813		✓					
LA County SD (Long Beach)	CA0054119		✓					
LA County SD (Los Coyotes)	CA0054011		✓					
LA County SD (Pomona)	CA0053619		✓					
LA County SD (San Jose Creek)	CA0053911		✓					
LA County SD (Saugus)	CA0054311		✓					
LA County SD (Valencia)	CA0054216		✓					
LA County SD (Whittier)	CA0053716		✓					
Mobil Oil Corp.	CA0055387	✓						
Ocean Vista Power Generation	CA0001180	✓						
Ojai Valley San Dist	CA0053961		✓					
Oxnard Wastewater Div. Plant	CA0054097		✓					

Attachment–Table 3

RWQCB 4 NPDES PERMITTED FACILITIES

Permittee	Permit No.	Major			Storm Water		Minor	
		Ind	Muni	Fed	MS4	Gen	all[1]	Gen
Powerine Oil Co.	CA0057177	✓						
SoCal Edison (Alamitos)	CA0001139	✓						
SoCal Edison (Dominguez	CA0052949	✓						
SoCal Edison (Ormond Beach)	CA0001198	✓						
SoCal Edison (Redondo)	CA0001201	✓						
San Buenaventura, City of	CA0053651		✓					
Shell Oil Products Co.	CA0000809	✓						
Simi Valley, City of	CA0055221		✓					
Texaco Refining & Marketing	CA0003778	✓						
Thousand Oaks, City of DPW	CA0005629		✓					
Tosco Corp. (Carson Plant)	CA0063185	✓						
Tosco Corp. (Wilm. Plant)	CA0000035	✓						
Ventura Regional SD	CA0054224		✓					
Construction SW (200 NOIs)	CAS000002					✓		
Industrial SW (2,600 NOIs)	CAS000001					✓		
LA County (84 Cities)	CAS614140				✓			
Ventura County (10 cities)	CAS063339				✓			
Groundwater (GW) from Dewatering [2]	CAG994001							✓
Treated GW from Dewatering [2]	CAG994002							✓
Treated GW From Clean Up Of Petroleum Fuel Pollution [2]	CAG834001							✓
VOC Contaminated GW [2]	CAG914001							✓
Hydrostatic Test Water [2]	CAG674001							✓
Cooling Water [2]	CAG254000							✓
Total Permittees		18	25	1	2	2	260	6

[1])industrial and municipal minor permittees not listed individually
[2])six general permit categories with 345 enrollees

Attachment–Table 4

RWQCB 4 APPROVED PRETREATMENT PROGRAMS & ACTIVITIES

Program	Reviewed by EPA	Pretreatment Compliance Inspections & Audits					
		FY	PCI/Audit	Target	Actual	Report	WENDB
Burbank	✓	94/95	Audit	1/1/95	1/25/95	Yes	No
		95/96	PCI	3/1/96			
		97/98	PCI	5/1/98			
Camarillo	✓	95/96	Audit	3/1/96	3/26/96	Yes	No
Las Virgenes	✓	94/95	PCI	1/1/95	5/16/95	No	No
		96/97	Audit	6/1/97			
Los Angeles City	✓	94/95	PCI	9/1/94	10/18/94	Yes	Yes
		95/96	PCI	3/1/96			
Los Angeles County		94/95	PCI	1/1/95	6/8/95	No	No
Ojai	✓	95/96	PCI	2/1/96			
		96/97	PCI	12/1/96	4/3/97	Yes	No
Oxnard	✓	96/97	Audit	6/1/96			
		96/97	PCI	9/1/96			
San Buenaventura	✓	94/95	Audit	4/1/95	5/18/95	No	No
		95/96	PCI	5/1/96			
		96/97	PCI	8/1/96			
Simi Valley		95/96	PCI	3/1/96			
		96/97	PCI	8/1/96	10/4/96	Yes	No
Thousand Oaks	✓	95/96	PCI	3/1/96			
		96/97	PCI	11/1/96	4/9/97	Yes	Yes
Ventura	✓	95/96	Audit	1/1/96	2/23/96	Yes	Yes

Attachment–Table 5

INVENTORY OF RWQCB 4 MAJOR NPDES ACTIONS BY YEAR

Year	NOVs[1]	TSOs	CAOs	CDOs	ACLCs			
					No. Issued	$ Proposed by RWQCB	$ Assessed by Board	$ Collected
1995	NR[2]	0	7	1	1	$211,200	$ 11,200	0
1996	NR	0	4	2	4	$196,805	$195,805	$ 51,250
1997	360[3*]	2	10	1	1	$20,000	$ 20,000	$ 15,000
1998 (as of 6/1)	568[4,7]	4	16	2	21[5]	$3,471,740[6]	3,524,140	$230,520
Total						$ 2,482,780[6]		

Figures on this Table may vary slightly due to conversion of tracking systems (WDS to ERIS to SWIMS). Also, collected penalty amounts do not include amounts that have/are funding supplemental environmental projects.

Notes Key

1) "NOVs" include informal letters, for all RWQCB programs, not just NPDES majors
2) "NR" indicates not reviewed
3) 1997 NOV data for 7-12/97 only
4) 1998 NOV data thru 3/31 only
5) 4 of these ACLCs relate to violations of storm water permit requirements
6) $2,300,000 of this amount is attributable to a single assessment against the City of Thousand Oaks
7) This amount includes the hundreds of letters sent to industrial facilities as part of a statewide initiative to identify non-filers that are potentially subject to storm water permit requirements.

APR 0 5 1999

Mr. John Norton, Chief
Compliance Assurance and Enforcement Unit
California State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Dear Mr. Norton:

As we discussed during our February 11, 1999, meeting with representatives from the Regional Water Quality Control Boards (RWQCBs) and the State Water Resources Control Board (SWRCB), enclosed is the list of issues in the NPDES program which all agreed are applicable throughout the State of California. These issues were identified during our NPDES reviews conducted last year at RWQCBs 4, 5, and 9. Each issue statement on the enclosed includes the actions we all agreed were needed to resolve each issue. Please distribute the enclosed list to the appropriate individuals at the SWRCB and RWQCBs.

I want to thank you for facilitating our meeting of February 11 - it greatly contributed to our being able to reach agreement on these issues and the actions needed to address them. If there are any questions on the enclosed information, please do not hesitate to contact me at (415) 744-1817 or Ms. Jenée Gavette at (415) 744-1942.

Sincerely,

Original signed by:

Mike Schulz
Associate Director
Water Division

Enclosure

EPA NPDES PROGRAM REVIEW
CALIFORNIA STATE-WIDE ISSUES - March 1999

EPA's NPDES program reviews conducted to date at Regional Water Quality Control Boards (RWQCBs) 4, 5, and 9 have revealed issues which are applicable throughout the State of California. These State-wide issues, discussed and agreed-upon by the RWQCBs, State Water Resources Control Board (SWRCB), and EPA during meetings held in January and February of 1999, are listed below, along with the agreed-upon actions that address each one.

- The current lack of State-wide water quality standards for toxic pollutants, and the absence of a plan of implementation for establishing water quality based effluent limits for toxics and whole effluent toxicity, result in NPDES permit issuance problems at the RWQCBs.

  - Identified as an on-going problem, it was agreed that promulgation of the California Toxics Rule (CTR) and the State's adoption of the Inland Surface Waters and Enclosed Bays and Estuaries Plan's Implementation Policy would address this issue for most constituents.
  - In the interim, before the CTR becomes final and the State Implementation Policy is adopted, RWQCBs should refer to EPA's national guidance, *Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001, March 1991)*. This guidance is also summarized in *Guidance for NPDES Permit Issuance (EPA, Region 9, February 1994)*. RWQCBs should also refer to the fact sheets and permits that the SWRCB will provide on the Internet (see discussion below).
  - EPA's national Permit Writers Training Course, to be given in San Francisco the week of March 22, 1999, will provide detailed instructions on the development of water quality based effluent limits in NPDES permits, giving permit writers at the RWQCBs some guidance on how to write permits addressing these issues, until the CTR and the State's Implementation Policy are completed.

- Adoption of NPDES permits containing compliance schedules for water quality based effluent limitations is not allowable, unless an authorizing provision is contained in the applicable water quality control plan.

  - Sheila Vassey, SWRCB Counsel, will address this issue by writing a memorandum to be sent to the RWQCBs and EPA.

- Permit fact sheets/statements of basis need to clearly establish that permits are consistent with applicable statutes, regulations, and policy (e.g., reasonable potential, antibacksliding, establishing mixing zones, determining dilution credits, etc.).

  - Good examples of fact sheets that defend permitting decisions will be provided in EPA's national Permit Writers Course, to be given in San Francisco beginning on March 22, 1999. EPA has requested that an additional course be given in California later this calendar year.

- These examples, along with the permits they defend, will be provided on the Internet by the SWRCB for reference by the RWQCBs.
- This issue will be referred to California's NPDES Roundtable for further discussion, and EPA will participate.
- The recommended method for reasonable potential analysis is provided in EPA's national guidance, *Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001, March 1991)*. This guidance is also summarized in *Guidance for NPDES Permit Issuance (EPA, Region 9, February 1994)*. Both documents are available to the RWQCBs and SWRCB.

- Appropriate receiving water limitations language, for which acceptable model language was recently developed by EPA, the State Water Resources Control Board (SWRCB), and the California Storm Water Quality Task Force, needs to be included in all forthcoming municipal storm water permits.

  - EPA, the SWRCB, and the RWQCBs all agree to use this new language in all future municipal storm water permits.
  - As EPA issues MS4 permits, EPA will send copies to the SWRCB for distribution to all RWQCBs.

- Copies of inspection reports of major permittees, as well as copies of responses from permittees about violation follow-up, must be sent by all RWQCBs to EPA, in accordance with the Memorandum of Agreement (MOA) between EPA and State of California.

  - This issue will be discussed and resolved at California's NPDES Roundtable meeting on March 23, 1999. Bob Wills from EPA will participate.

- Compliance review of Discharge Monitoring Reports (DMRs) is often not timely, especially for minors.

  - This issue will be referred to California's NPDES Roundtable for resolution; the SWRCB will develop procedures by May 1999 for use by all RWQCBs.

- The Quarterly Non-Compliance Reports (QNCRs) submitted by the RWQCBs need improvement in quality and content.

  - Jose Angel of the State and Bob Wills of EPA will provide procedures and training for the RWQCBs this calendar year.

- Field presence/compliance assessment at NPDES major and minor facilities is not adequate. Issues include use of appropriate sampling methods, adequacy of field inspection notes, and depth of on-site review.
  - The SWRCB's Compliance Assurance and Enforcement Unit is developing procedures to address this issue, targeted for completion in June 1999, with State-wide implementation thereafter. EPA will assist the SWRCB in this effort.

- A greater inspection presence in the storm water program for both industrial and construction sites needs to be established by all RWQCBs; this program element is significantly under funded State-wide.
  - The identification of non-filers is a high priority and should be emphasized.
  - Expected level of inspection presence needs to be defined, as well as procedures for targeting inspections (geographic or otherwise). The State Urban Runoff Task Force will address this issue. The "floor" of a credible state-wide storm water compliance program needs to be defined. EPA compliance staff will assist in this effort.
  - EPA will work with the State to decide what activities will be funded in the coming year, e.g., identification of non-filers, development of the "floor" for a credible inspection program, and a given number of storm water inspections (SWRCB notes that $100,000 = 100 inspections).

- Pretreatment program expertise, in general, needs to be strengthened State-wide. Industrial user regulation by the State is needed. Industrial user compliance problems, especially when the pretreatment authority is for whatever reason unable to exert authority over the industrial user, must be addressed by the State.
  - Instances where EPA has identified water quality problems due to pretreatment noncompliance need to be addressed promptly by the State.
  - Pretreatment priority and work commitments need to be addressed in next year's Clean Water Act Section 106 workplan.
  - Sheila Vassey, SWRCB Counsel, will write a memorandum regarding the State's industrial user enforcement authority, to be furnished to EPA, the SWRCB, and the RWQCBs.
  - Development and availability of State-wide pretreatment expertise will be addressed by the State's NPDES roundtable, i.e., how and where to provide this expertise (at the RWQCBs or SWRCB).
  - SWRCB will identify significant unregulated industrial users.

- All RWQCB penalty actions need to recover economic benefit resulting from noncompliance, in accordance with EPA policy, the MOA, the State's Administrative Procedures Manual (APM), and the State Enforcement Policy.
  - The State economist has evaluated BEN (EPA's model for determining economic benefit) and determined that it's a useful tool to determine economic benefit.
  - RWQCBs will attend BEN training, to be scheduled this calendar year by EPA.
  - The State Compliance and Enforcement Roundtable is developing both penalty assessment and settlement procedures. EPA will participate in these Roundtable discussions.

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CLERK, CONTROL BOARD
LOS ANGELES REGION

Sizing and Design Criteria for Stormwater Treatment Controls

Presented to the

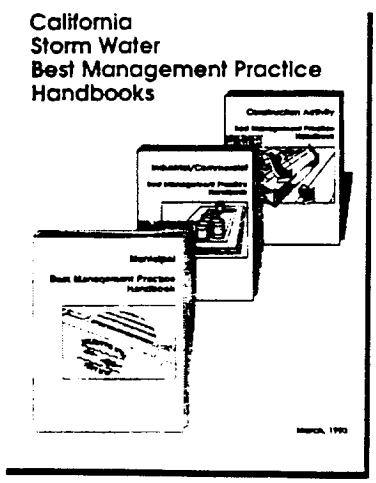
California Stormwater Quality Task Force

b y

Larry A. Roesner, Ph.D., P.E.

November 13, 1998

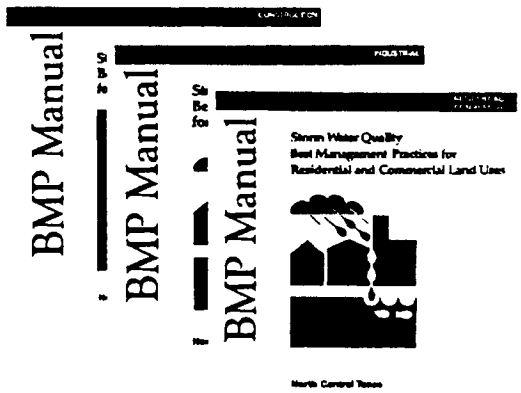
The Start of Something Big



(1993)

R0070390

Not to be Outdone!

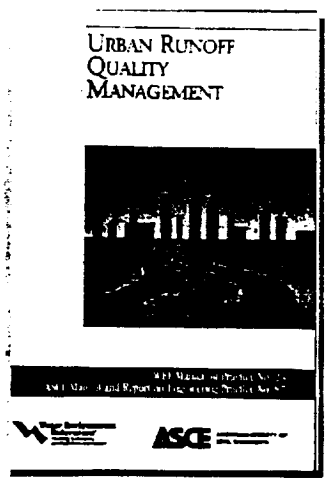


(1995)

WWW@WEF.ORG MINOR TECHNICAL INTEREST

The Joint ASCE/WEF MOP

Pragmatic

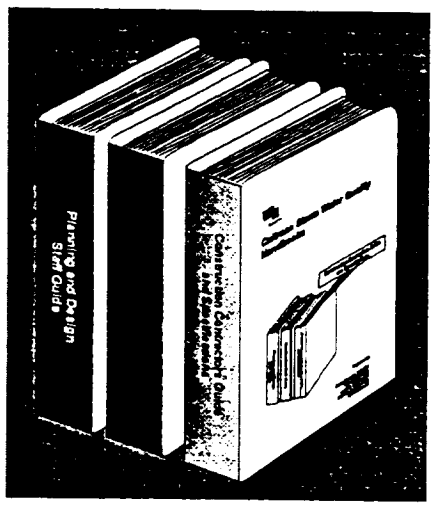


Broadly Based

(1998)

R0070391

Targeting Highway Runoff



(1997)

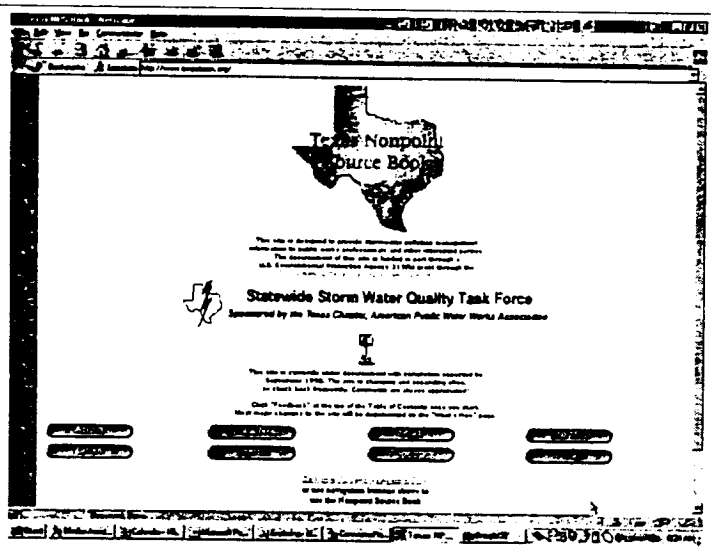
Dead Possum BMP



Any Roads worker happening upon road kill shall not ignore same, but rather pick it up gingerly by the tail (lest it still have some bite left) and dispose of it properly by heaving same to the side of the road.

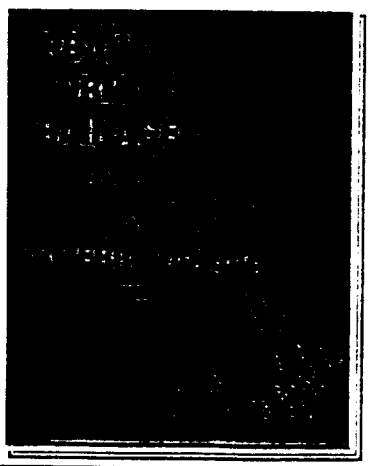
DO NOT PLACE IN STORM SEWER, SINCE IT DRAINS TO RECEIVING WATER

Oh No! Its Texas Again!



(1998)

Update and Complete Volume 3 - BMP Manual



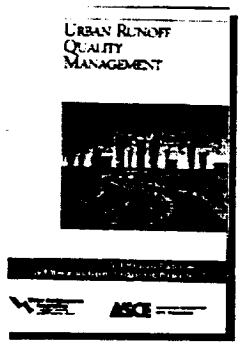
The Denver Urban Drainage and Flood Control District

BMP Manual

(1998)

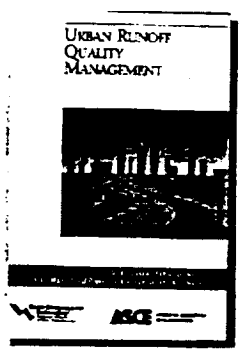
The ASCE/WEF MOP

- Defines the state-of-practice
- Diversity of disciplines, vocations and geography represented
- Introduces ecology into the equation



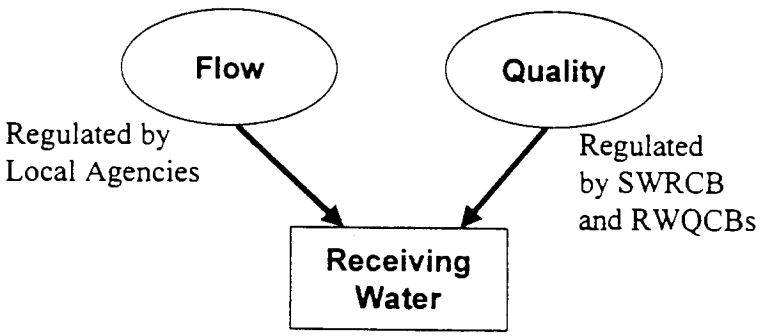
MOP Table of Contents

- Introduction to Urban Runoff
- Developing Municipal Stormwater Management Programs
- Monitoring Modeling and Performance Auditing
- Source Controls
- Selection and Design of Passive Treatment Controls



R0070394

The Urban Stormwater Problem



Stormflow Impacts

- 100 year peak flow increases 2 X
- 15 year peak flow increases 3 X
- 2 year peak flow increases **57 X**

- 2-yr peak flow occurs 3 X per year (res dev)
- 6 X per year (comm.)

Stormwater Flow Impacts

- Channel scours destroys ecologic habitat
- Sedimentation smothers biota
- Changed hydroperiod affects estuary ecology

If Anything Survives the Flow Impacts

- Urban runoff contains a variety of pollutants
  - TSS
  - Heavy Metals
  - Nutrients
  - Bacteria

The Fact Is:

Simply reducing pollutants in the runoff to the Maximum Extent Practicable will probably not result in significant improvement to the ecologic condition of the receiving waters

Flow management is also required

Urban Runoff Hydrology

The Design Storm

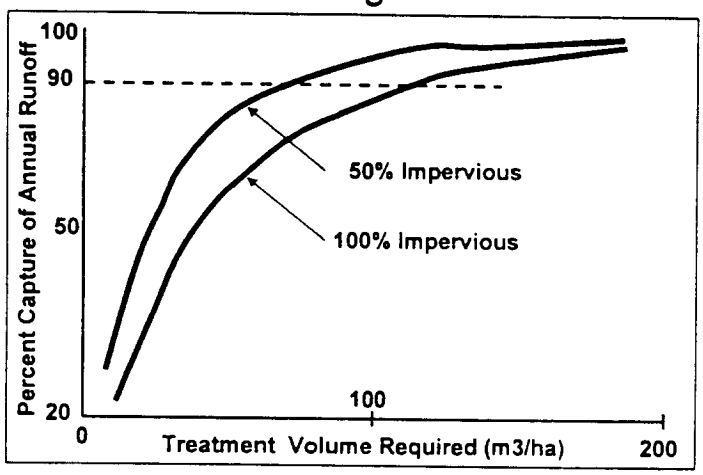
Small storms account for most of the runoff and are affected most by urbanization.

85 percent of the storms in coastal California are less than1 inch of rainfall

85 percent of the storms in inland areas are less than 0.65 inches

California BMP Manual

The Design Storm



Maximized Water Quality Capture Volume

The Design Storm

$$P_o = a \cdot C \cdot P_A$$

where:

P_o = Maximized Water Quality Capture Volume (in.)

a = Capture Volume Coefficient

C = Watershed Runoff Coefficient

P_A = Mean Storm Precipitation Volume (in.)

Maximized Volume for California

$P_o = a \cdot C \cdot P_A$

a = 1.3 - 1.6 for 85% capture of annual runoff

P_A = 0.6 inches along the cost
= 0.4 inches inland

$P_{o\ (coast)}$ = 0.12 - 0.14 inches (residential, C=0.15)
= 0.70 - 0.86 inches (commercial, C=0.9)

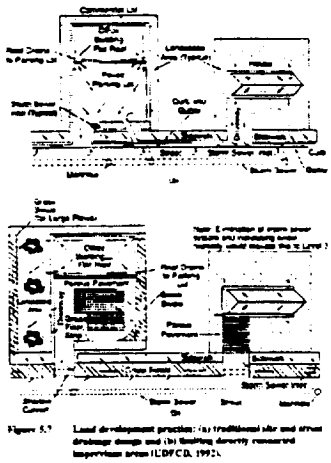
$P_{o\ (inland)}$ = 0.08 - 0.10 inches (residential, C=0.15)
= 0.50 - 0.58 inches (commercial, C=0.9)

The Design Storm

Design of Treatment Controls

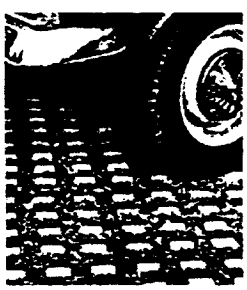
R0070399

Minimize DCIA

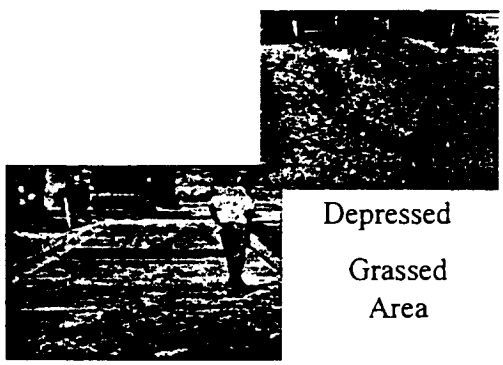


- Drain Hard Lot Surfaces onto Pervious Areas
- Use Modular Pavement where Feasible
- Drains Streets to Swales

Lot/Site Drainage



Modular Pavement

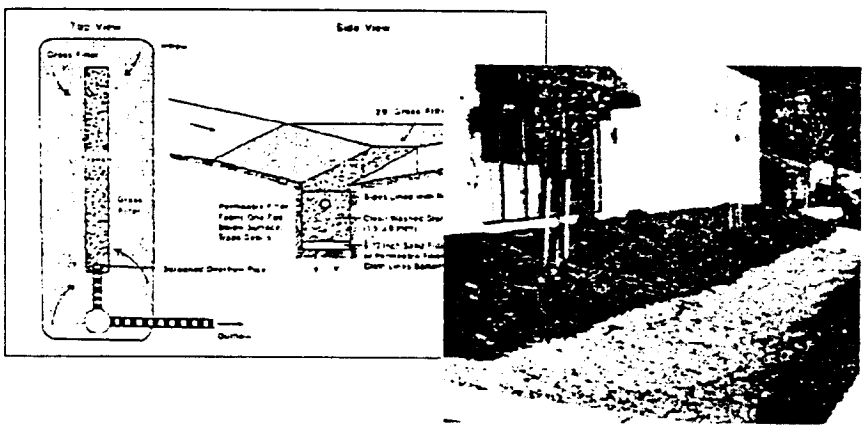


Depressed Grassed Area

Grassed Parking Area Reinforced with Geotextile Fabric

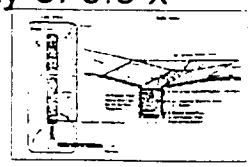
Lot/Site Drainage

Percolation Trench



Basic Design Criteria Percolation Trench

- Seasonal High groundwater or bedrock more than 4 ft below trench bottom
- Do not locate in fill material or recompacted soils
- Soil should be type A or B with minimum hydraulic conductivity of 6.5 x 10^5 ft/sec
- Po based on lot size and %I



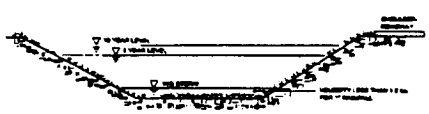
Use Swales for Road and Parking Lot Drainage







Design Criteria Swales

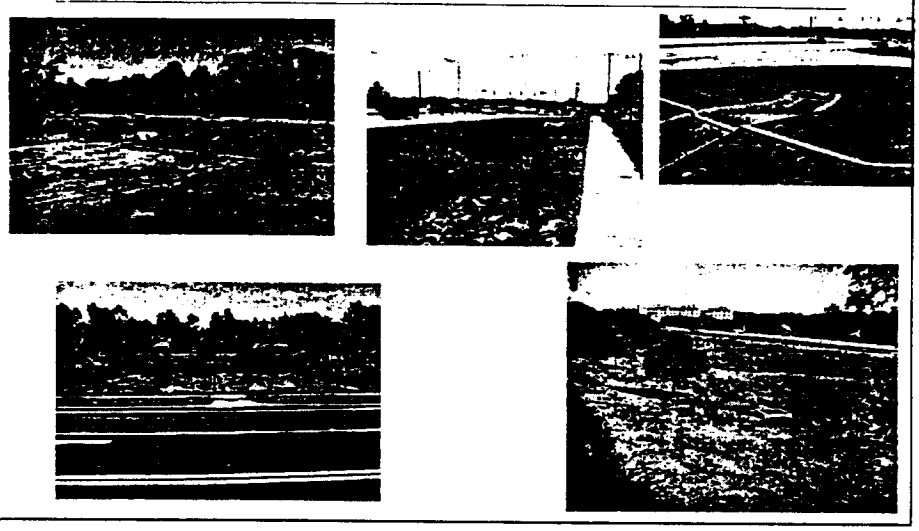


- Provide 1-2% slope
- Max V < 1 ft/sec
- Max bottom width, 8 ft
- Min bottom width, 2 ft

- Minimum length 100 ft
- Maximum water height for maximized storm than 1/2 the height of standing vegetation
- Po sized for road runoff plus the portion of maximized storm not captured on building site

R0070402

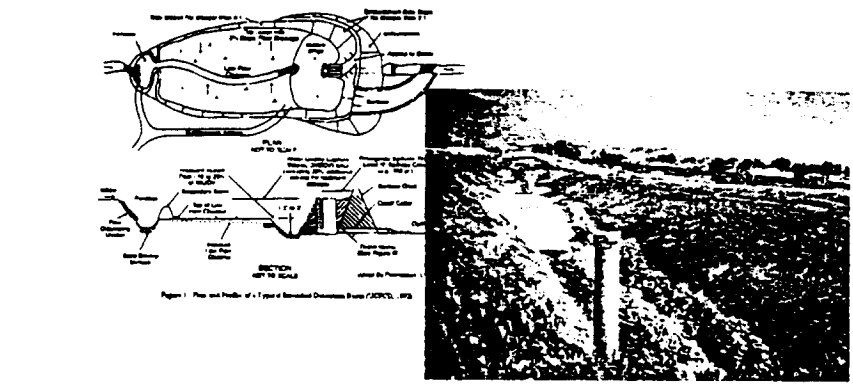
Infiltration Basins



Design Criteria
Infiltration Basins

- Seasonal groundwater or bedrock > 4 ft below basin bottom
- Do not locate on fill or compacted soils
- Soil must be type A or B with saturated surface infiltration rate > 0.3 in/hr
- Size to drain Po in 12 hour
- Use point system in book for rating suitability of a site

Extended Detention



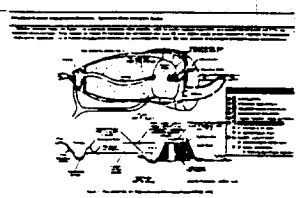
Extended Detention comes in many forms





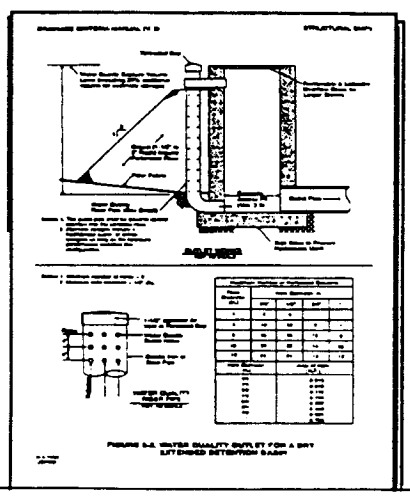


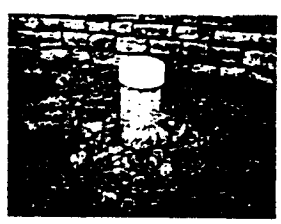
Extended Detention Design Criteria



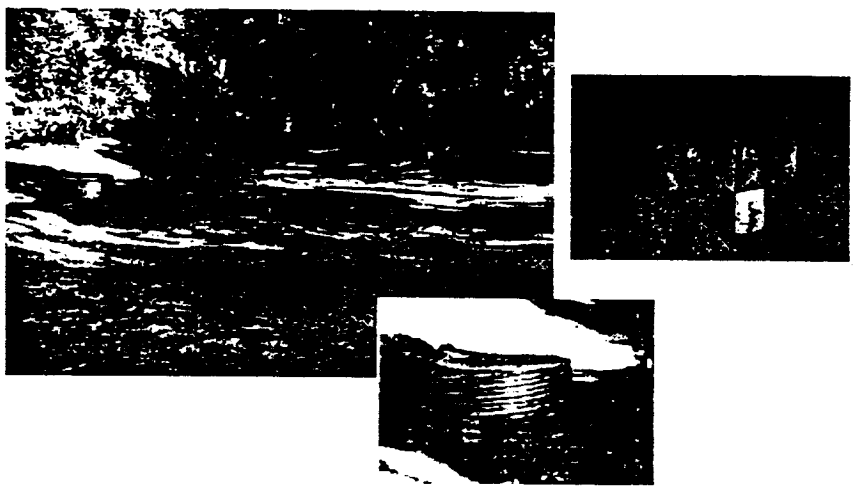
- Size to detain Po for 12 to 24 hours, then add 20% for sediment storage
- Use two stage design (empty less than 50% of volume in first 1/3 of detention time
- Sediment forebay recommended
- Clogging outlets are most common failure
- Emergency spillway
- Sideslopes 1:4

Extended Detention (cont)

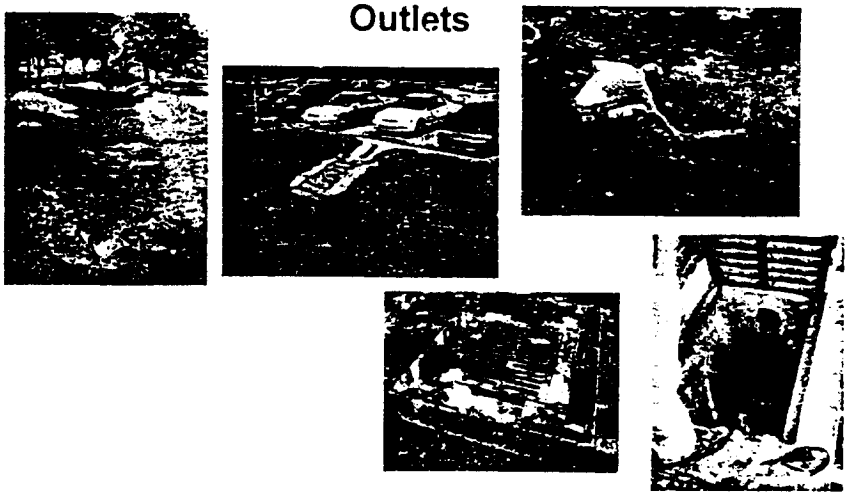




Extended Detention (cont)



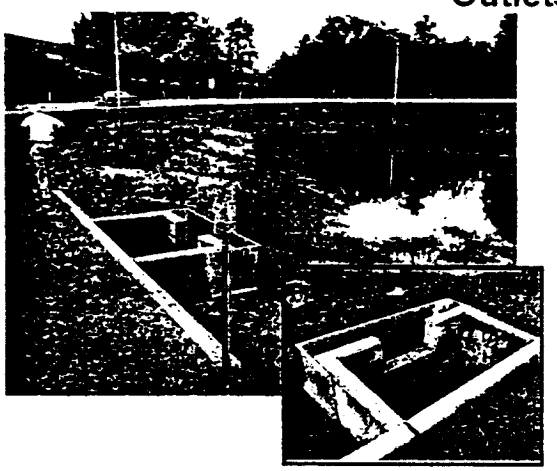
Extended Detention (cont)

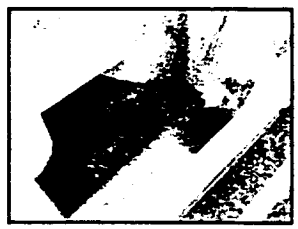


R0070406

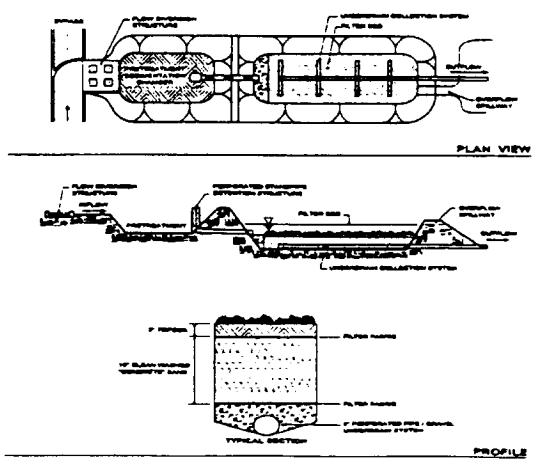
Extended Detention

Outlets (cont)





Detention w/ Filtration

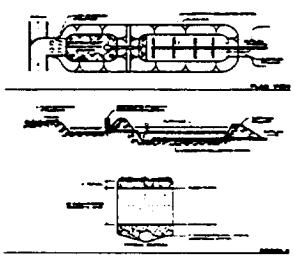


R0070407

Detention w/ Filtration Classic Application



Detention w/ Filtration Design Criteria

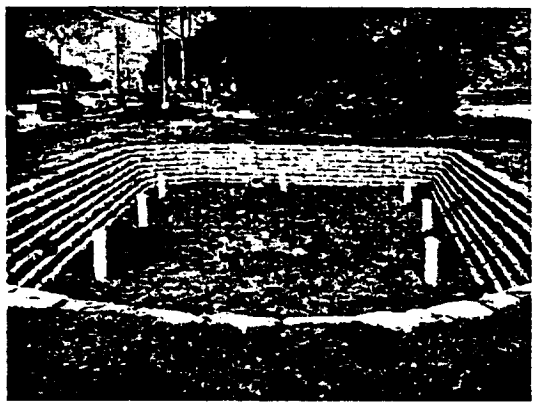


- Capture Po or 1/2 inch of runoff from impervious area
- 24 - 40 hour drawdown time
- Minimum sand bed = 18 inches
- Seal bottom of filter chamber
- Underdrain the sand filter

- Provide smooth flow transition from presedimentation chamber to filter chamber

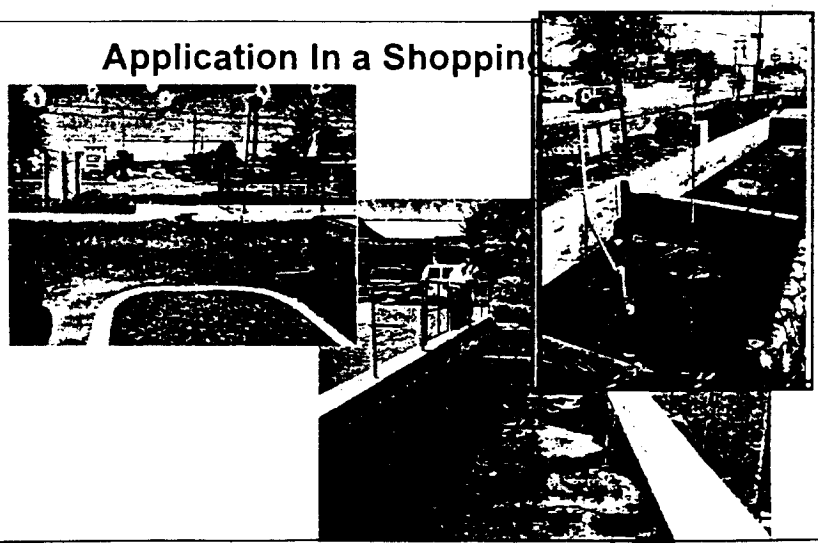
Detention w/ Filtration

Applications



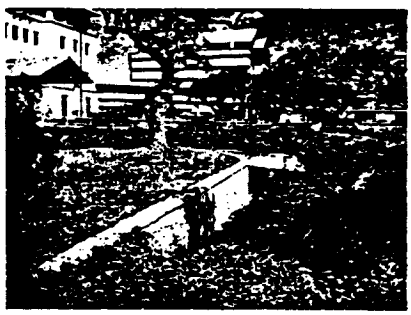
Detention w/ Filtration

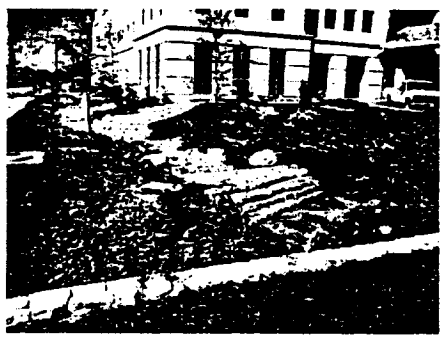
Application In a Shoppin



Detention w/ Filtration

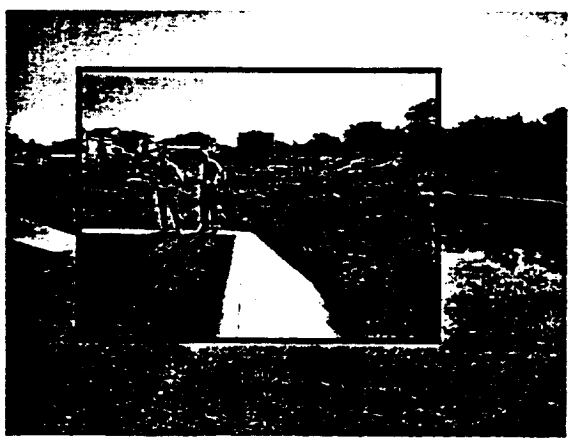
Application to a Business Site





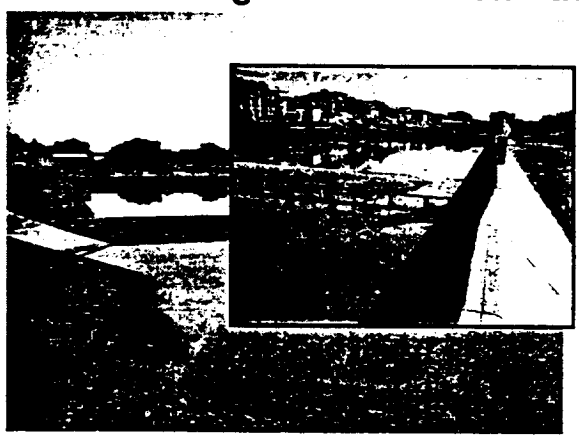
Detention w/ Filtration

Retrofit to a Regional Detention Basin

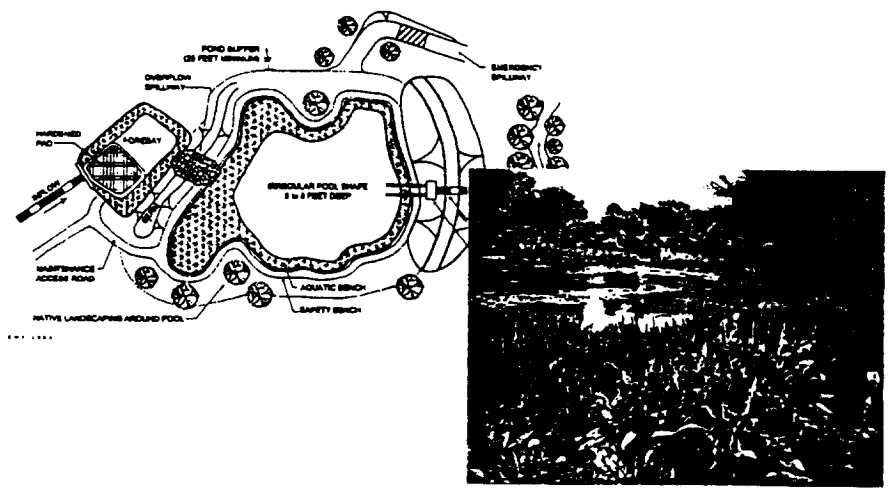


Detention w/ Filtration

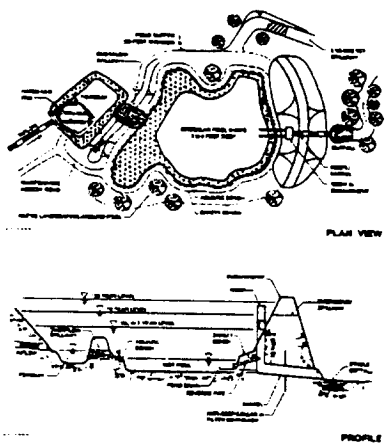
Retrofit to a Regional Detention Basin



Retention

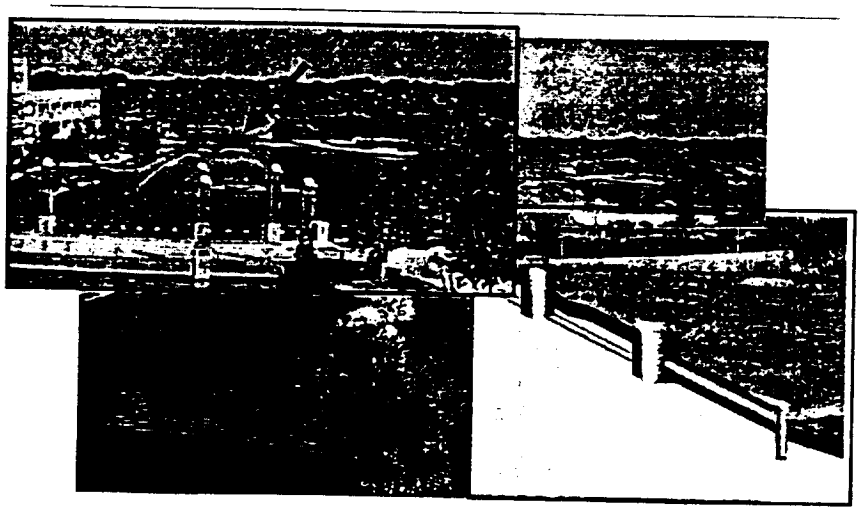


Retention - Design Criteria



- Design by one of two methods
  - Solids-settling theory
  - Lake eutrophication theory
- Both facilities are larger than an extended detention basin for the same drainage area
- For biochemical design, size to hold runoff from wettest two weeks for 14 days
- Design as regional facilities as landscape amenity

Retention w/ Added Detention



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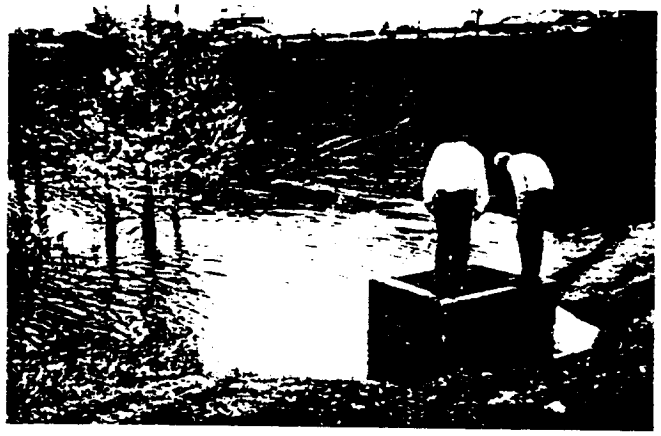
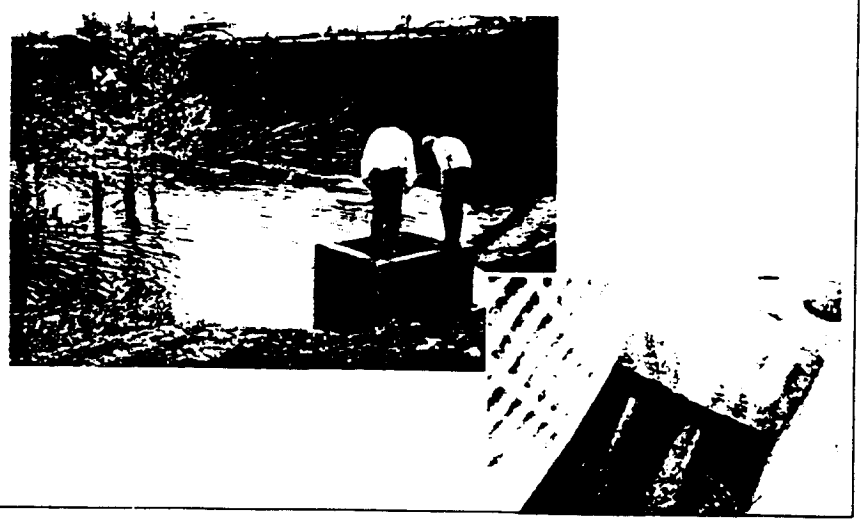
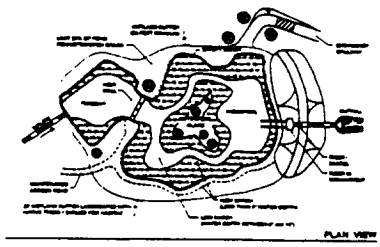
Retention Pond Outlet

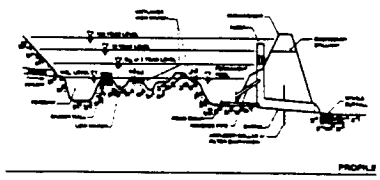


Retention



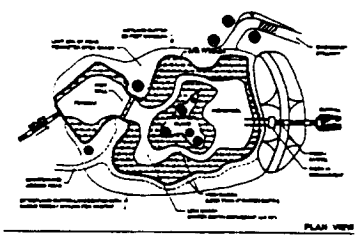
Constructed Wetland

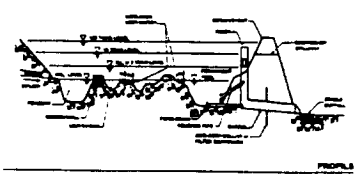






Constructed Wetland Design Criteria





- Use same guidelines as biological retention, but detention time is 14 days during wettest month
- Open water is less that 50% of total facility surface area
- Use a wetland biologist for developing planting program

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Wetlands



two years ago

today, a year
after cleaning



Summary

- Design for the small storm
- Minimize Directly Connected Impervious Area
- Use the treatment train concept
- Design outlet controls as multi-stage to reproduce natural flow frequency curve

Thank You

URBAN RUNOFF QUALITY MANAGEMENT



WEF Manual of Practice No. 23
ASCE Manual and Report on Engineering Practice No. 87

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Preserving & En the Global Wate

24hrs

AMERICAN SOCIETY OF CIVIL ENGINEERS

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needs and fiscal strength, local priorities and preferences, regulatory demands, other infrastructure needs and fiscal demands, and many other's are part of the equation. Also, this chapter is most useful if the reader has become familiar with the topics discussed in Chapters 1 through 4.

Ideally, structural BMPs should be a part of the treatment train discussed in Chapter 4—namely, source control BMPs. Good housekeeping measures need to be practiced to ensure adequate performance and longevity of structural facilities. For example, if erosion control during construction is not being rigorously practiced within the catchment being served by the structural control facility, the facility will probably be rendered inoperative in a short time. For example, a detention basin, a retention pond, or a constructed wetland will fill with sediment, and infiltration devices will fail. Thus, without implementing source erosion controls, the investment in the structural facilities will be lost, and expensive rehabilitative maintenance or reconstruction of these facilities will then be needed to return them to a working condition.

It is best that the practices described in Chapter 5 be selected through a comprehensive planning process. This could involve systemwide simulation of rainfall and runoff processes, preferably using a continuous model. Some of the selection of practices actually may be based on monitoring, bioassessments, or the understanding of effects on the receiving systems. Chapters 1, 2, and 3 address all of those topics and form the foundation and an introduction to all topics covered in this chapter.

HYDROLOGY FOR THE MANAGEMENT OF STORMWATER QUALITY

In 1990, the U.S. Environmental Protection Agency (U.S. EPA) promulgated National Pollution Discharge Elimination System regulations regarding the permitting of stormwater discharges from municipal storm sewer systems. These rules require the municipalities to reduce the pollutants in urban runoff to the maximum extent practicable (MEP). The definition of MEP for the control of stormwater pollutant discharges has focused primarily on the application of economically achievable management practices. Because stormwater runoff rates and volumes vary from storm to storm, the statistical probabilities of runoff events and their management have to be considered in the development of practices to meet the MEP goal. It is paramount that the hydrology of urban runoff be examined within this context.

The type and size of storm runoff events to use for the design of runoff treatment systems need to be examined. "Treatment systems" are those measures that are often referred to in the literature as "BMPs." Among these are swales; buffer strips; infiltration basins and percolation trenches; extended

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detention basins; "wet" ponds that retain some or all of one event's runoff until it is displaced by the runoff from a subsequent event; media filters; and a variety of other devices and facilities. Guidelines for the design of these types of facilities can be found in this chapter and elsewhere (Livingston *et al.*, 1988; Roesner *et al.*, 1989; Schueler, 1987; Urbonas and Roesner [Eds.], 1986; and Urbonas and Stahre, 1993).

LONG-TERM RAINFALL CHARACTERISTICS. Hydrologists typically look at the infrequent events: either large storms for drainage and flood protection or drought periods for water supply development. But what characteristics are representative of the storms that produce most rainfall on a long-term basis?

Figure 5.1 presents the cumulative probability distribution of daily precipitation data for 40 years at Orlando, Florida, and Cincinnati, Ohio. These data have been screened to include only precipitation events 2.5 mm (0.1 in.) or greater in Cincinnati and 1.5 mm (0.06 in.) or greater in Orlando. Cumulative occurrence probabilities were computed for values ranging from 2.5 to 51 mm (0.1 to 2.0 in.).

Examination of Figure 5.1 reveals most of the daily values to be less than 25 mm (1 in.) in total depths. In Orlando, which averages 1 270 mm (52 in.) of rainfall per year, 90% of these events produce less than 36 mm (1.4 in.) of rainfall. In Cincinnati, which has 1 016 mm (40 in.) per year of precipitation, 90% of the events produce less than 20 mm (0.8 in.) of rainfall. By contrast,

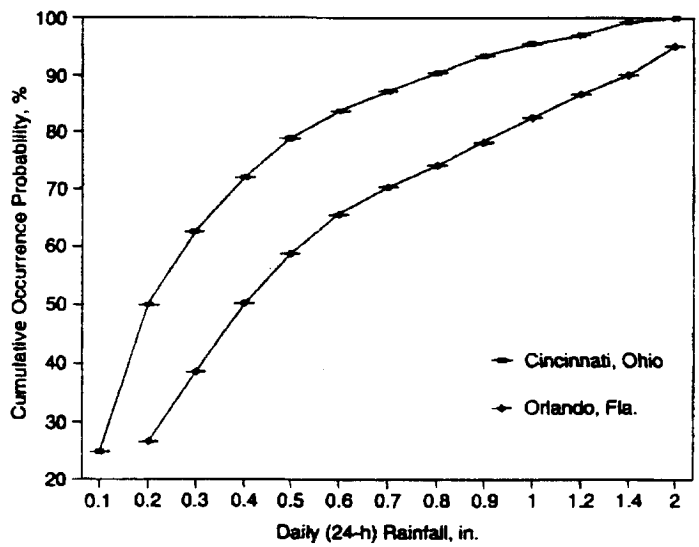

Figure 5.1 **Cumulative probability distribution of daily precipitation for two cities in the U.S. (in. × 25.4 = mm) (Roesner *et al.*, 1991).**

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the 2-year, 24-hour storm produces precipitation of 127 mm (5.0 in.) in Orlando and 74 mm (2.9 in.) in Cincinnati. This suggests that capturing and treating runoff from "smaller" storms should capture a large percentage of the runoff events and runoff volume that occur from the urban landscape. Also, a water quality facility capable of capturing these smaller storms would also capture the "first flush" portion of the larger, infrequently occurring runoff events.

CAPTURE OF STORMWATER RUNOFF. To illustrate the terms "smaller" and "most" discussed earlier, long-term simulations of runoff were examined for six U.S. cities by Roesner *et al.* (1991) using the Storage, Treatment, Overflow, Runoff Model (STORM). The six cities were Butte, Montana; Chattanooga, Tennessee; Cincinnati, Ohio; Detroit, Michigan; San Francisco, California; and Tucson, Arizona. The Storage, Treatment, Overflow, Runoff Model is a simplified hydrologic model that translates a time series of hourly rainfall to runoff then routes the runoff through detention storage.

Hourly precipitation records of 40 to 60 years were processed by Roesner *et al.* (1991) for a variety of detention basin sizes for the six cities. These simulations were performed using the characteristics of the most typically occurring urban developments found in each city. Table 5.1 lists the average annual rainfall and the area-weighted runoff coefficient at each of the study watersheds. Runoff capture efficiencies of detention basins were tested using an outflow discharge rate that emptied or drained the design storage volume in 24 hours. This drawdown time was based on field study findings by Grizzard *et al.* (1986) in the Washington, D.C., area. They determined that a detention basin had to be designed to empty out a volume equal to the average runoff event's volume in no less than 24 hours to be an effective stormwater quality enhancement facility. The findings by Roesner *et al.* (1991) are illustrated in Figure 5.2.

One way to define a cost-effective basin size is to represent it as that which is located on the "knee of the curve" for capture efficiency. This "knee" is evident on the six curves in Figure 5.2. Urbonas *et al.* (1990) have

Table 5.1 Hydrologic parameters used at six study watersheds (Roesner *et al.*, 1991).

City	Average annual rainfall, in. (mm)	Runoff coefficient of study watershed
Butte, Montana	14.6 (371)	0.44
Chattanooga, Tennessee	29.5 (749)	0.63
Cincinnati, Ohio	39.9 (1 013)	0.50
Detroit, Michigan	35.0 (889)	0.47
San Francisco, California	19.3 (490)	0.65
Tucson, Arizona	11.6 (295)	0.50

Annual Runoff Captured, %

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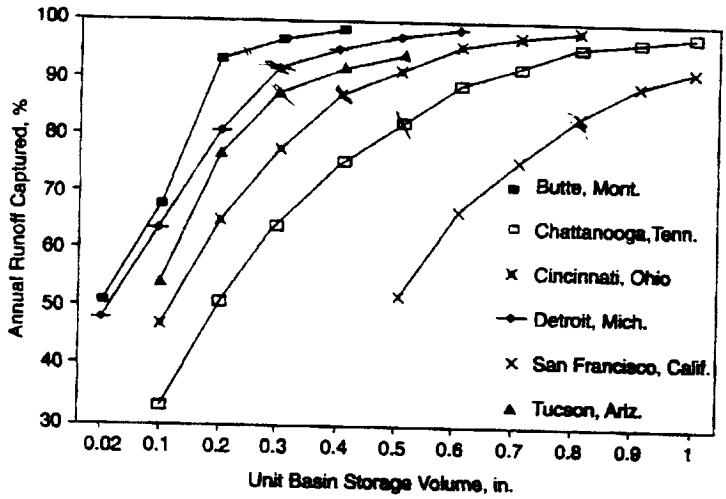

Figure 5.2 **Runoff capture rates versus unit storage volume at six study sites (Roesner *et al.*, 1991).**

defined this "knee" as the "optimized" capture volume and reported on a sensitivity study they performed relative to this volume for the Denver, Colorado, area. Later, Urbonas and Stahre (1993) redefined this "knee" as the "maximized" volume because it is the point at which rapidly diminishing returns in the number of runoff events captured begin to occur. For each of the six study watersheds previously described, the maximized storage volume values are listed in Table 5.2.

The sensitivity investigation by Urbonas *et al.* (1990) also estimated the average annual stormwater removal rates of total suspended sediments using the maximized volume as the surcharge storage above a permanent pool of a retention pond. Estimates of total suspended sediment removals were performed using the procedure reported by Driscoll (1983). Similarly, the runoff

Table 5.2 **Maximized unit storage volume at six study watersheds (Roesner *et al.*, 1991).**

City	Maximized storage volume[a]	
	in. (mm)	ac-ft/ac (m^3/ha)
Butte, Montana	0.25 (6.4)	0.021 (63.5)
Chattanooga, Tennessee	0.50 (12.7)	0.042 (127)
Cincinnati, Ohio	0.40 (10.2)	0.033 (102)
Detroit, Michigan	0.30 (7.6)	0.025 (76.2)
San Francisco, California	0.80 (20.3)	0.067 (203)
Tucson, Arizona	0.30 (7.6)	0.025 (76.2)

[a] Based on the ratio of runoff volume captured from all storms.

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Table 5.3 **Sensitivity of the best management practice capture volume in Denver, Colorado (Urbonas *et al.*, 1990).**

Capture volume to maximized volume ratio	Annual runoff volume captured, %	Number of storms completely captured	Average annual total suspended sediments removed, %
0.7	75	27	86
1.0	85	30	88
2.0	94	33	90

capture and total suspended sediment removal efficiencies were estimated for capture volumes equal to 70 and 200% of the maximized volume. These findings are summarized in Table 5.3.

Review of Table 5.3 shows that doubling of the maximized capture volume results in a very small increase in the total annual runoff volume captured and an insignificant increase in the average annual removal of total suspended sediments. When 70% of the maximized volume is used, only a moderate decrease occurs in the volume of runoff captured and an insignificant decrease in the annual total suspended sediment load removed. Based on these findings, the Denver, Colorado, municipal area adopted an 80th percentile runoff event (that is, 95% of the maximized event) as the basis for the sizing of stormwater quality BMPs. This 80th percentile runoff event is now considered by the municipalities in this semiarid region of the U.S. as cost effective for stormwater quality management and is viewed as the design event that achieves MEP definition under the Clean Water Act.

Although the MEP event is not clearly defined by the regulations, insight to the appropriate MEP design event can be gained by performing an analysis of local long-term hourly rainfall data similar to those reported in Tables 5.1 though 5.3. These analyses form a basis for making a rational decision in defining sizing criteria for various BMPs. As an example, the maximized unit runoff volume for a watershed in Denver, Colorado, with a runoff coefficient $C = 0.5$, is 7 mm (0.28 watershed in.), or 70 m^3/ha (0.023 ac-ft/ac). This compares well with the maximized storage volumes listed in Table 5.2 for Butte, Montana, and Tucson, Arizona—namely, the two semiarid communities on that list.

As can be seen from Figure 5.2 and Tables 5.2 and 5.3, most runoff-producing events occur from the predominant population of smaller storms, namely, less than 13 to 25 mm (0.5 to 1.0 in.) of precipitation. To be effective, stormwater quality management should be designed based on these smaller events. As a result, detention facilities, wetland basins, infiltration facilities, media filters, and possibly swales need to be sized to accommodate runoff volumes and flows from such storm events to maximize pollution control benefits in a cost-effective manner.

R0070422

AN APPROACH FOR ESTIMATING STORMWATER QUALITY CAPTURE VOLUME. Estimating a Maximized Water Quality Capture Volume. Whenever local resources permit, the stormwater quality capture volume may best be found using continuous hydrologic simulation and local long-term hourly (or lesser time increment) precipitation records (see Chapter 3). However, it is possible to obtain a first-order estimate of the needed capture volume using simplified procedures that target the most typically occurring population of runoff events.

Figure 5.3 contains a map of the contiguous 48 states of the U.S. with the mean annual runoff-producing rainfall depths superimposed (Driscoll *et al.*, 1989). These mean depths are based on a 6-hour interevent time to define a new storm event and a minimum depth of 2.5 mm (0.10 in.) of precipitation for a storm to produce incipient runoff. After an extensive analysis of a number of long-term precipitation records from different meteorological regions of the U.S., Guo and Urbonas (1995) found simple regression equations to relate the mean precipitation depths in Figure 5.3 to "maximized" water quality runoff capture volumes (that is, the knee of the cumulative probability curve).

The analytical procedure was based on a simple transformation of each storm's volume of precipitation to a runoff volume using a coefficient of runoff. To help with this transformation, a third-order regression equation, Equation 5.1 (Urbonas *et al.*, 1990), was derived using data from more than 60 urban watersheds (U.S. EPA, 1983). Because the data were collected nationwide over a 2-year period, Equation 5.1 should have broad applicability in the U.S. for smaller storm events.

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04 \qquad (5.1)$$

Where

C = runoff coefficient, and
i = watershed imperviousness ratio; namely, percent total imperviousness divided by 100.

Equation 5.2 relates mean precipitation depth taken from Figure 5.3 to the "maximized" detention volume. The coefficients listed in Table 5.4 are based on an analysis of long-term data from seven precipitation gauging sites located in different meteorological regions of the U.S. The correlation of determination coefficient, r^2, has a range of 0.80 to 0.97, which implies a strong level of reliability.

$$P_0 = (a \cdot C) \cdot P_6 \qquad (5.2)$$

Where

P_0 = maximized detention volume determined using either the event capture ratio or the volume capture ratio as its basis, watershed in. (mm);

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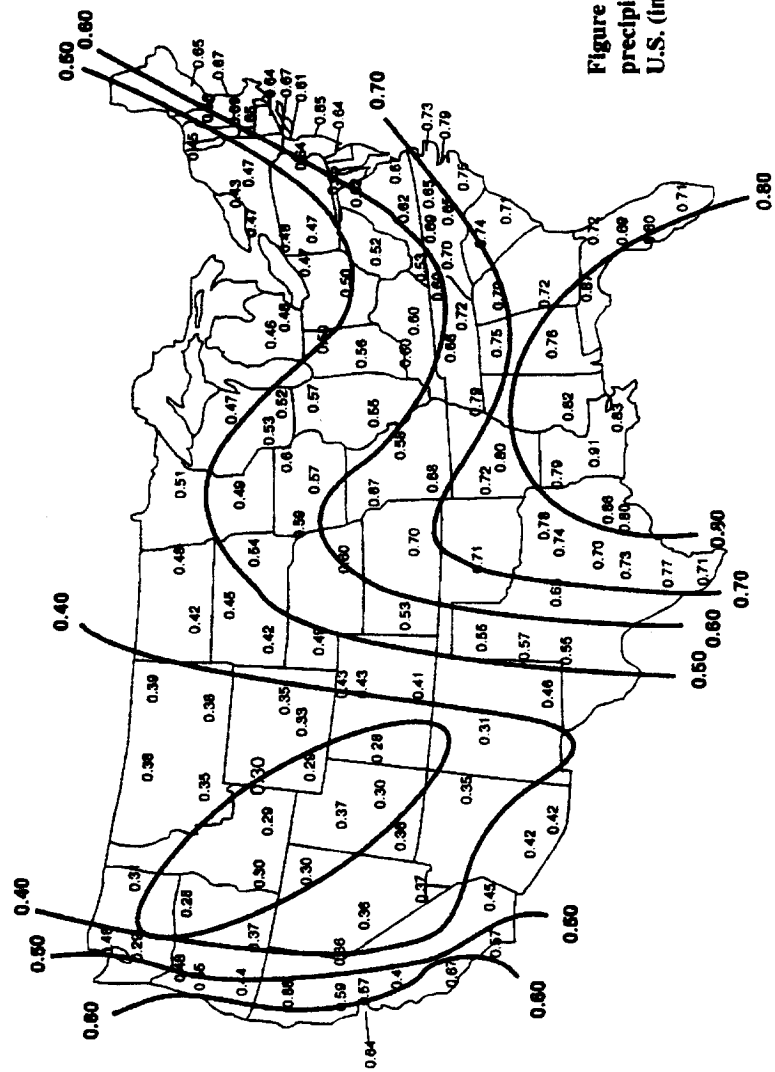

Figure 5.3 Mean storm precipitation depth in the U.S. (in. [in. × 25.4 = mm]).

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Table 5.4 Values of coefficient *a* in Equation 5.2 for finding the maximized detention storage volume (Guo and Urbonas, 1995).[a]

		Drain time of capture volume		
		12 hours	24 hours	48 hours
Event capture ratio	a =	1.109	1.299	1.545
	r^2 =	0.97	0.91	0.85
Volume capture ratio	a =	1.312	1.582	1.963
	r^2 =	0.80	0.93	0.85

[a] Approximately 85th percentile runoff event (range 82 to 88%).

a = regression constant from least-squares analysis;
C = watershed runoff coefficient; and
P_6 = mean storm precipitation volume, watershed in. (mm).

Table 5.4 lists the maximized detention volume/mean precipitation ratios based on either the ratio of the total number of storm runoff events captured or the fraction of the total stormwater runoff volume from a catchment. These can be used to estimate the annual average maximized detention volume at any given site. All that is needed is the watershed's runoff coefficient and its mean annual precipitation.

The actual size of the runoff event to target for water quality enhancement should be based on the evaluation of local hydrology and water quality needs. However, examination of Table 5.3 indicates that the use of larger detention volumes does not significantly improve the average annual removal of total suspended sediments or other settleable constituents. It is likely that an extended detention volume equal to a volume between the runoff from a mean precipitation event taken from Figure 5.3 and the maximized event obtained using Equation 5.2 will provide the optimum-sized and most cost-effective BMP facility. A BMP sized to capture such a volume will also capture the leading edge (that is, first flush) of the runoff hydrograph resulting from larger storms.

Runoff volumes that exceed the design detention volume either bypass the facility or receive less efficient treatment than do the smaller volume storms and have only a minimal net effect on the detention basin's performance. If, however, the design volume is larger and has an outlet to drain it in the same amount of time as the smaller basin, the smallest runoff events will be detained only for a brief interval by the larger outlet. Analysis of long-term precipitation records in the U.S. shows that small events always seem to have the greatest preponderance. As a result, oversizing the detention can cause the most frequent runoff events to receive less treatment than provided by properly designed smaller basins.

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Example of a Water Quality Capture Volume Estimate. It is desired to estimate the maximized storage volume for a 223-ha (550-ac) watershed that has 40% of its area covered by impervious surfaces. Assume that this site is located in Houston, Texas (that is, the largest storm region of the U.S.). The detention basin needs to be sized and designed to drain its water quality capture volume in no fewer than 24 hours. Substituting a value of 0.40 (that is 40/100) for the variable I in Equation 5.1 yields a runoff coefficient C = 0.30. Using Figure 5.3 we find the mean storm precipitation depth in Houston: $P6$ = 20.3 mm (0.8 in.). From Table 5.4 we find the coefficient a = 1.299 for the 24-hour drain time. Thus, the maximized detention volume is calculated as follows:

$$P_0 = (1.299 \cdot C) = 0.39 \text{ in. } (0.026 \text{ ac-ft/ac})$$

$$P_0 = 7.9 \text{ mm } (79 \text{ m}^3/\text{ha})$$

The volume of an extended detention basin for this 223-ha (550-ac) watershed needs to be 17 600 m^3 (14.3 ac-ft). It is recommended that this volume be increased by at least 20% to account for the loss in volume from sediment accumulation. The final design then can show a total volume for the basin of 21 200 m^3 (17.2 ac-ft) with an outlet designed to empty out the bottom 17 600 m^3 (14.3 ac-ft) of this volume in approximately 24 hours.

SELECTION OF TREATMENT CONTROL BEST MANAGEMENT PRACTICES

As discussed in Chapter 4, the selection of particular stormwater quality controls (that is, BMPs) is often decided by considerations other than technical issues. These issues, among others, include

- Federal, state, and local regulations;
- Real and perceived receiving water problems;
- Beneficial uses of receiving waters to be protected;
- The cost of the BMPs being considered;
- Subjective and sometimes arbitrary acceptance by the regulators or community groups; and
- Watershed studies.

While reduction of pollutants in stormwater discharges to the MEP is the statutory requirement of the stormwater regulations, the real goal has to be the reduction of effects to urban stormwater runoff on the receiving water. The cost of the BMP is always a major consideration. Recognize that no sin-

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When Best Management Practices

On February 17, 1998, the Environmental Protection Agency (EPA) published their ruling for re-issuance of the National Pollutant Discharge Elimination System (NPDES) general permits. The ruling outlined Best Management Practices (BMPs) recommended for controlling sediment from construction sites.



R0070427



become Worst Management Practices

by **Jerald S. Fitfield, Ph.D.**

Not all BMPs are effective in controlling sediment in runoff waters and erosion. Unfortunately, the EPA ruling did not provide guidelines as to when mitigation measures are not to be installed. As a result, Storm Water Pollution Prevention Plans (SWPPP) are being developed with, and contractors are installing, mitigation measures that often increase the potential for erosion, increase downstream flooding, and increase downstream sedimentation.

Limitation of barriers

Straw or hay bale barriers

America has a love affair with bale barriers. They are the most common mitigation measures illustrated in SWPPPs and found on construction sites. While their use is widespread, the EPA states they "... agree with these commenters and has modified the final general permits so that these [straw bales and brush barriers] are not specially listed as an appropriate structure control."

The failure of bales to control sediment is always evident after runoff events. Yet, designers continue to illustrate them on SWPPPs and regulatory agencies expect to see them as part of a sediment and erosion control plan. It sometimes appears that the definition of a barrier — "anything, material or immaterial, that acts to obstruct or prevent passage" — has been forgotten. Pity the poor contractors who have to install and maintain these "worst management practices."

Any designer, contractor, or inspector who understands the importance of proper installation, inspection, and maintenance knows that bales have limited uses on construction sites.

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When Best become Worst

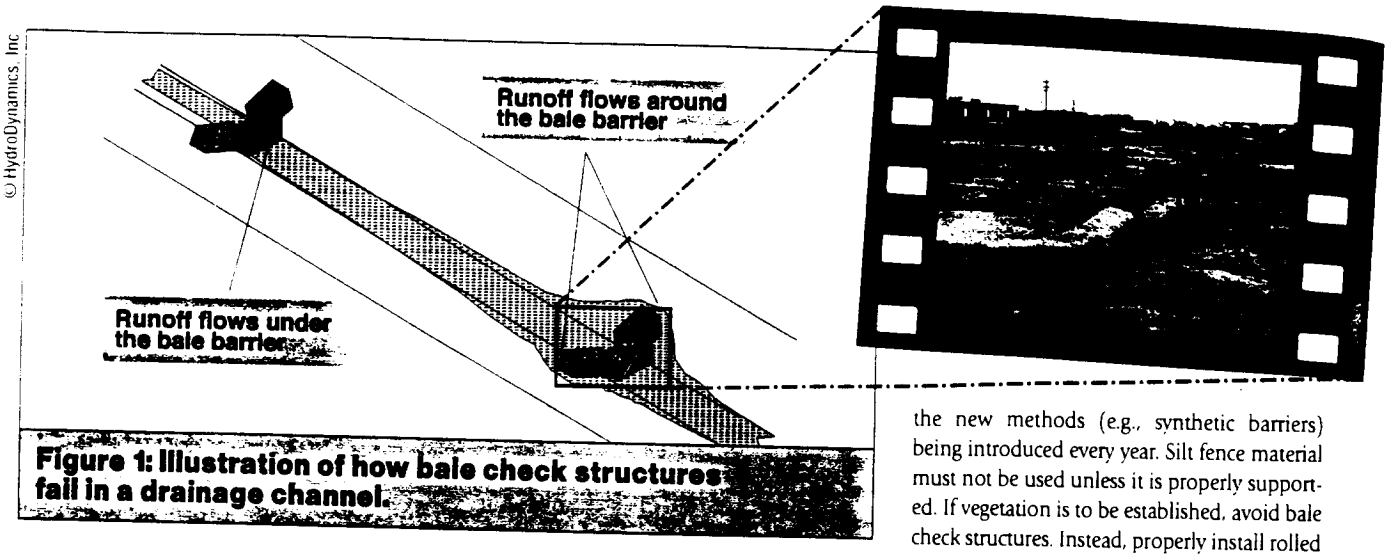

Figure 1: Illustration of how bale check structures fail in a drainage channel.

Specific problems include:

- Runoff waters do not readily seep through bales.
- Bales are not an effective method for filtering sediment.
- Bales are frequently not installed properly and runoff flows between, under, and around the structures.
- Bales are often not inspected or maintained.
- Bales are one of the more costly methods for controlling sediment in runoff waters.

Protecting drainage channels

Perhaps the most frequent use of barriers is as check structures in drainage channels. Unless bale barriers are properly installed, inspected, and maintained, their effectiveness in controlling sediment and erosion is practically nil. In addition, their effectiveness as a BMP to assist with vegetation establishment in a drainage channel is also nearly nonexistent.

Figure 1 illustrates two of the more common failures of bale check structures. Unless installed in a trenched, staked, and backfilled channel, water will flow under the bales. A more common problem in using them as check structures is not having a sufficient number of bales on the channels side slopes to force runoff over the flow line bales.

Instead of providing a BMP to reduce erosion, a worst management practice is specified by designers or regulatory agencies. Contractors then install the bale barriers as required. The result is channel degradation and significant amounts of sediment being transported downstream.

What is a solution to this problem? Of course, proper installation, inspections, and maintenance of the bales must occur. However, other techniques should be considered. Properly sized rock check structures (see Figure 2) provide an excellent alternative as do some of the new methods (e.g., synthetic barriers) being introduced every year. Silt fence material must not be used unless it is properly supported. If vegetation is to be established, avoid bale check structures. Instead, properly install rolled erosion control products (RECPs) (see Figure 3) in the channel.

Protecting area drains

Techniques often proposed in SWPPPs to reduce sediments in runoff waters entering

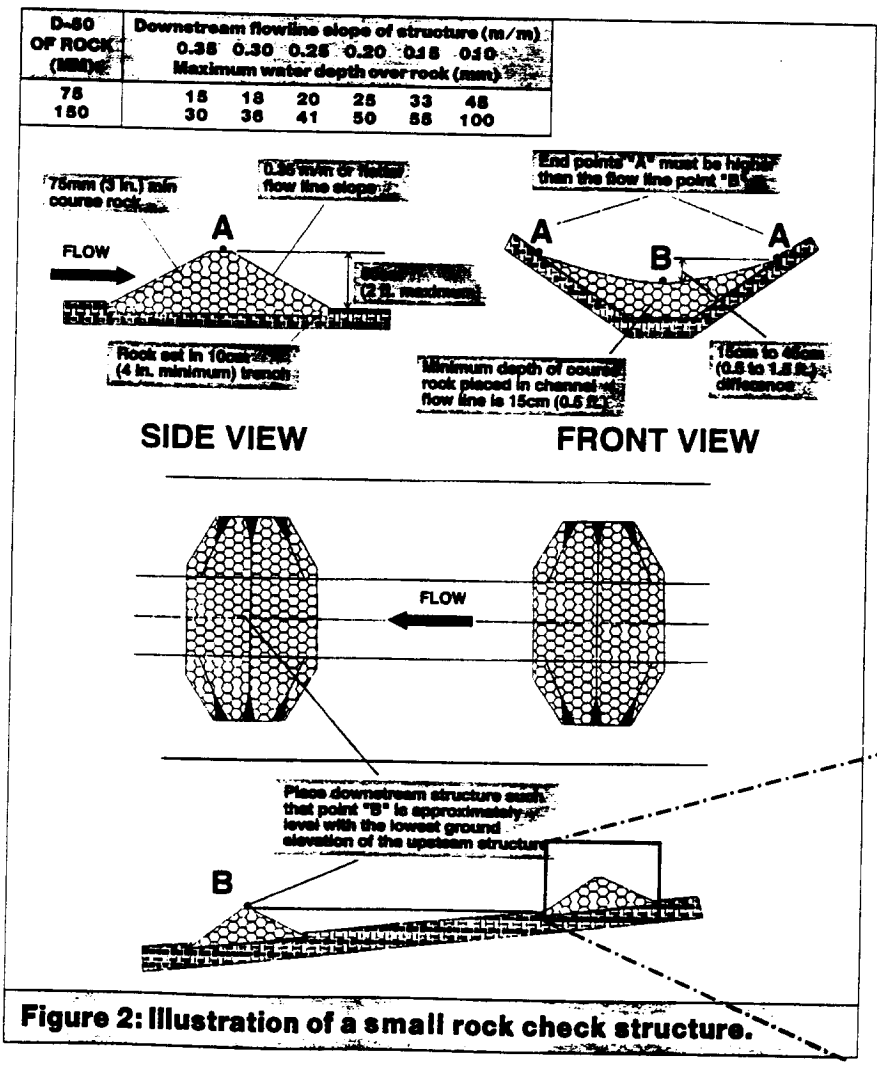

Figure 2: Illustration of a small rock check structure.

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inlets are bale and silt fence barriers. Unfortunately, neither technique can be classified as a resoundingly successful BMP.

As an example, consider protecting area drains in roadway medians. When roadway median drains are on a grade and bale barriers placed around the inlets, the following usually occurs (see Figure 4):

- The barriers divert runoff waters to downstream locations.
- Diversion around inlets cause downstream flooding and downstream deposition of sediment.
- Diversions cause bale structures to experience massive failure.

The barriers no longer serve as BMPs. Runoff and sediment enter the drainage system and discharge pollutants into downstream waters.

What is a solution to this problem? Remove the barriers around an area drain and allow runoff waters to flow into the inlet! Instead of placing bales around an inlet, install a properly designed upstream sediment containment system. Since medians are long and narrow, they provide ideal conditions for efficient sediment traps. When properly installed and maintained, sediment traps (see Figure 5) will reduce sediment in runoff waters and allow inlets to function in a manner for which they are designed — as drainage systems.

If sufficient space does not exist for a containment system, then install a riprap check structure (see Figure 2) to serve as a sediment trap. However, care must be taken to ensure the rock used has sufficient diameter and mass to avoid failure for large flow events.

Silt fence barriers around sump area drains

Only around "sump" area drains should any type of barrier be installed. Unfortunately, when barriers are properly installed around a sump inlet, localized flooding can occur. Also, since water seeps slowly through hay or straw bales (if at all), pond conditions can remain for a long time. A potential solution to this problem is to use a silt fence.



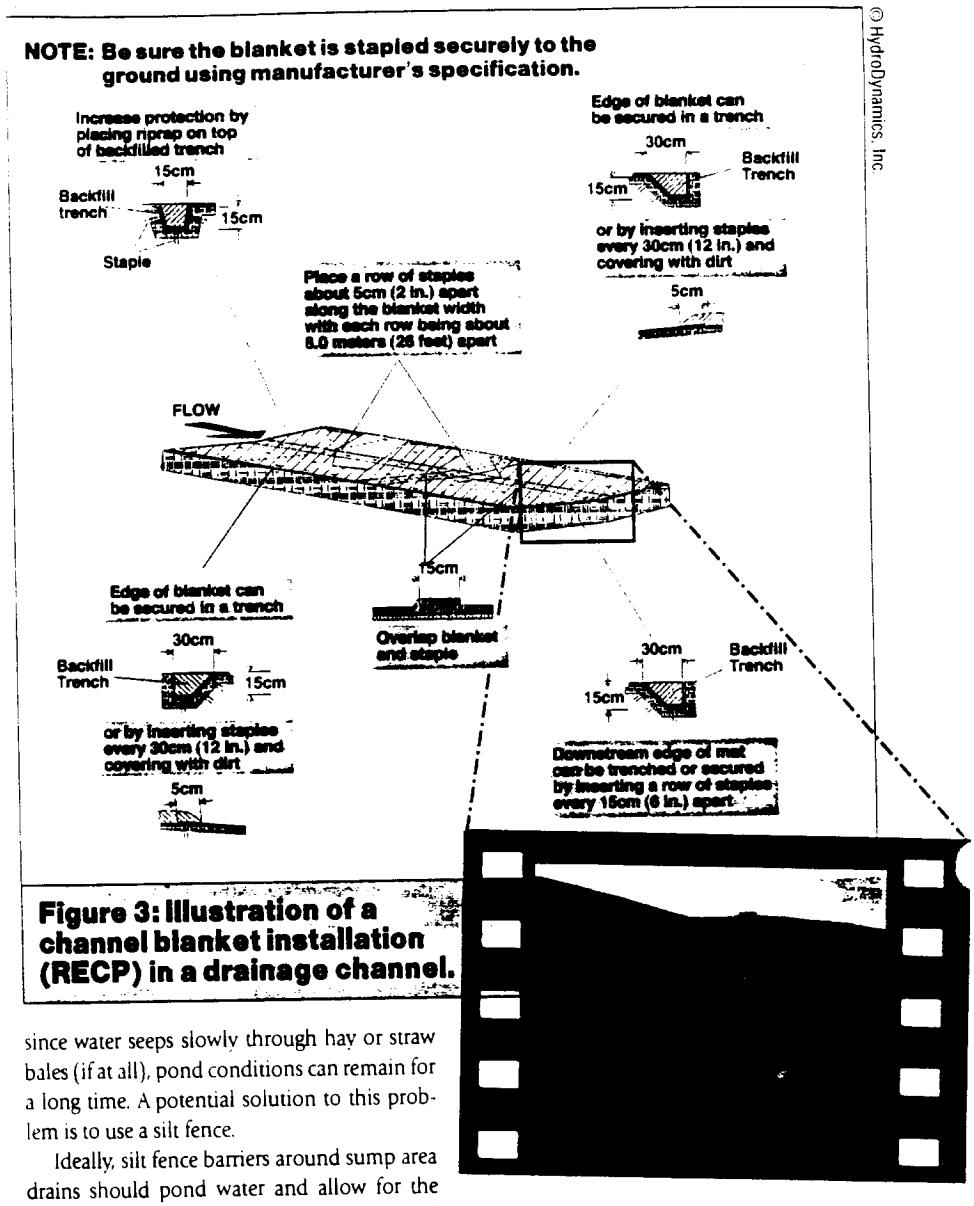

Figure 3: Illustration of a channel blanket installation (RECP) in a drainage channel.

Ideally, silt fence barriers around sump area drains should pond water and allow for the deposition of suspended particles. The material should also allow water to percolate into the drain. Fortunately, the idealized view of silt fence barriers found at the top of Figure 6 rarely occurs. Imagine the problems associated with nearly a three foot deep pond. Few situations could accommodate the accompanying localized flooding.

When water accumulates around the outside of a silt fence barrier, hydrostatic pressure usually causes the structure to collapse (see bottom of Figure 6). As a result, runoff waters and the accompanying suspended particles flow into the inlet.

How can these worst management practices become an acceptable BMP? If silt fence barriers around an area drain are to be effective in controlling sediment, the following must be completed:

- All corner posts must be securely braced.
- Gaps cannot exist in the perimeter materials around the inlet.
- Internal support must be provided by installing a wire mesh within the interior of the structure.
- Material must be properly installed in a trench and backfilled. Additional support of material between posts may require the installation of anchors.

An alternative to consider for silt fence (or bale) barriers around a sump drain is to use a rock barrier. When properly installed (see Figure 7), major localized flooding will not occur. Also, proper installation minimizes the

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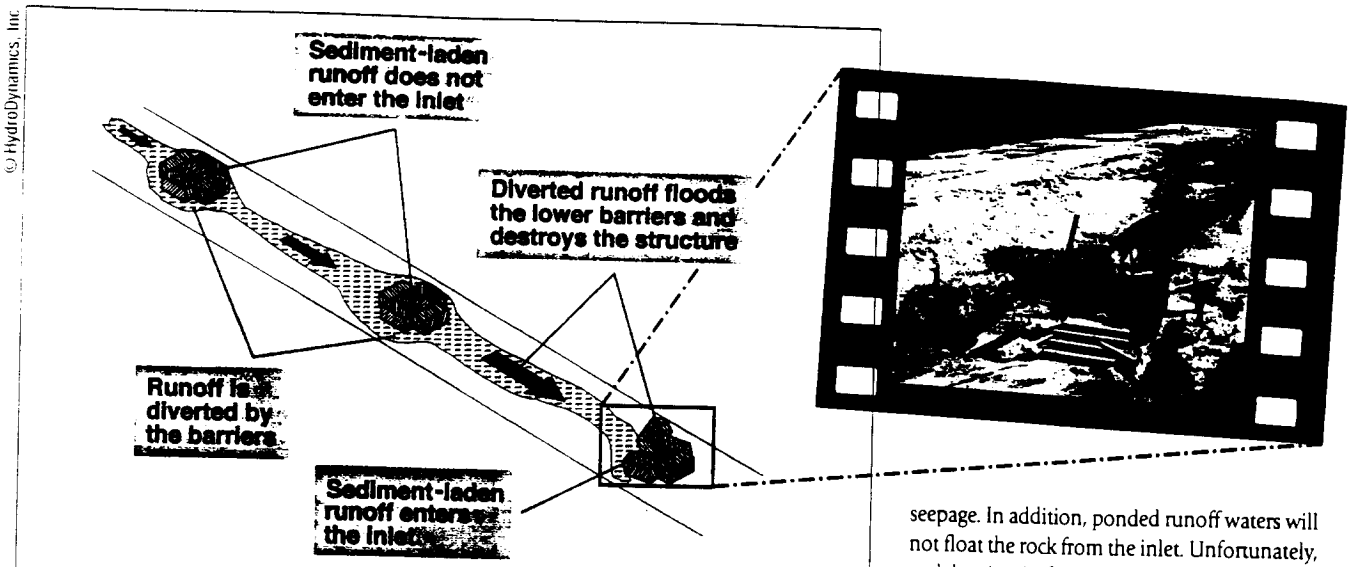

Figure 4: Illustration of bale barriers diverting water to downstream locations.

possibility of hydrostatic failure and ensures adequate drainage.

Rock barriers for curb inlets

Two common techniques often used to control sediment in runoff waters entering curb inlets are bale barriers and rock barriers. Bales should never be used since they cannot be installed correctly. They also prevent seepage and often divert runoff waters. In addition, dry 50-pound bales will float in less than six inches of water.

Rock barriers for curb inlets solve the problem of installing a structure that allows for seepage. In addition, ponded runoff waters will not float the rock from the inlet. Unfortunately, rock barriers in front of curb inlets are not very effective in reducing sediment in runoff waters. Even though seepage can occur, the structures tend to divert runoff to downstream locations.

Unless a curb inlet is located in a sump, little runoff enters the drainage system (see Figure 8). Runoff waters are often diverted downstream and eventually cause flooding and deposition of sediment. Consequently, a BMP becomes a worst management practice.

There are two solutions to the problem of protecting curb inlets installed on a grade. The

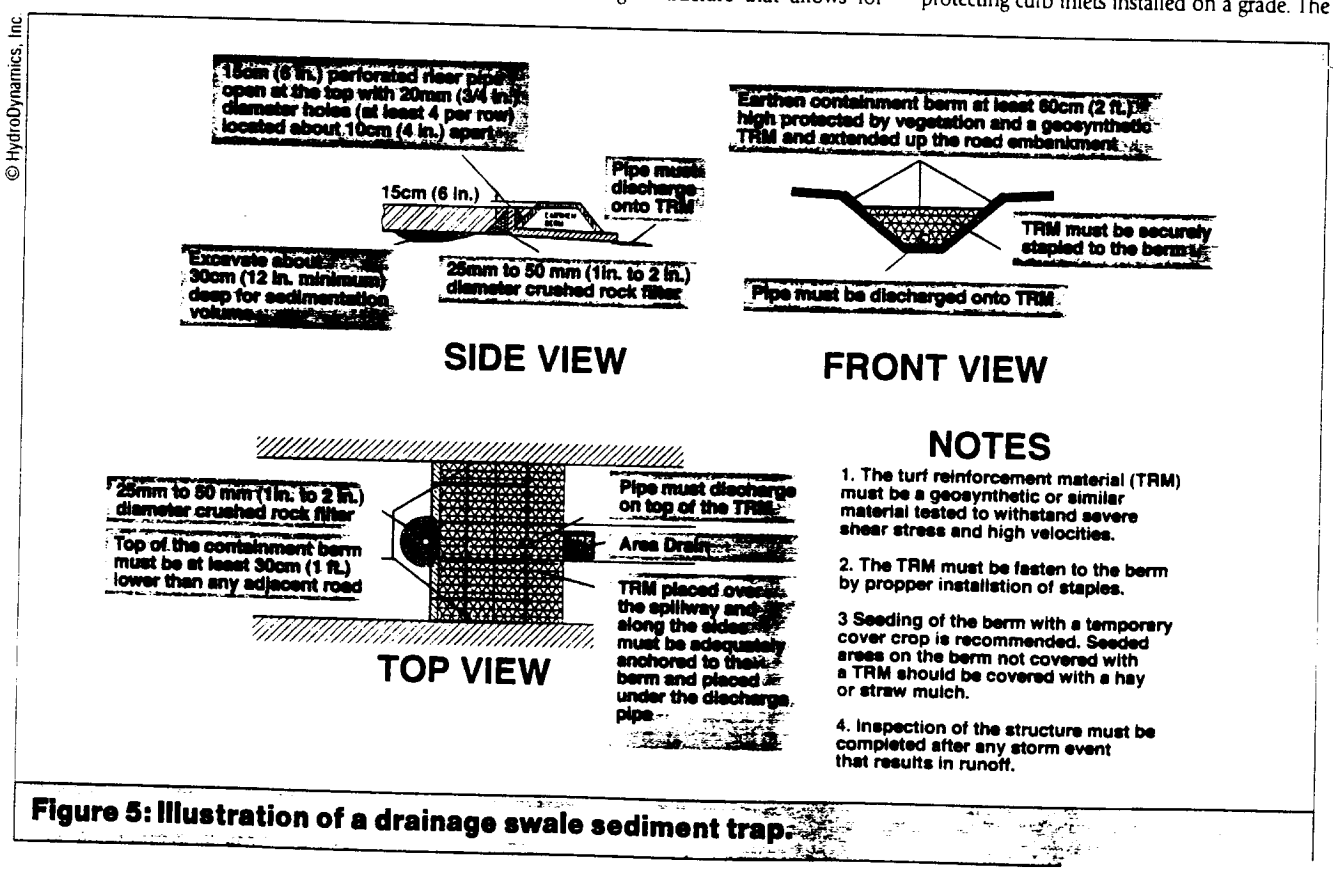

Figure 5: Illustration of a drainage swale sediment trap.

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more efficient method is to install an insert inside the inlet box. These are very effective and not subject to destruction. A second alternative is to place small curb sediment traps above the inlets (see Figure 9). With either the inserts or curb sediment traps, drainage into the inlet is not diverted. Hence, downstream flooding and downstream sedimentation is avoided.

Not all BMPs are effective in controlling sediment in runoff waters and erosion. Storm Water Pollution Prevention Plans are being developed with mitigation measures that often increase the potential for erosion, increase down-stream flooding, and increase downstream sedimentation.

Sediment containment systems

Sediment containment systems consist of basins or traps. In their February 17, 1999 ruling, the EPA stated the following criteria are to be followed when 10 or more acres are disturbed:

1.) Provide a sediment basin having a volume of 3,600 cubic feet per acre drained, or

2.) Provide a sediment basin with sufficient volume to capture runoff from the local two-year, 24-hour storm event when using local runoff coefficients.

The first criterion represents one inch of runoff resulting from about three inches of precipitation. The EPA considers three inches to be representative of a two-year, 24-hour storm event for the nation. Unfortunately, not all of the U.S. experiences these events.

How much precipitation will result in one inch of runoff? The answer to this question depends upon the soils and amount of precipitation. Figure 10 illustrates precipitation and runoff comparisons for different soils. Notice that only for sandy soils will one inch of runoff result from approximately three inches of precipitation. When clay soils are considered, then three inches of precipitation will cause about 2.4 inches of runoff.

How much storage volume should be developed to control runoff from clay soils? If all runoff resulting from a three-inch storm is to be captured, then about 8,640 cubic feet per acre should be provided. What is not clear in the EPA's ruling is whether 3,600 cubic feet per acre or 8,640 cubic feet per acre for clay soils should be selected.

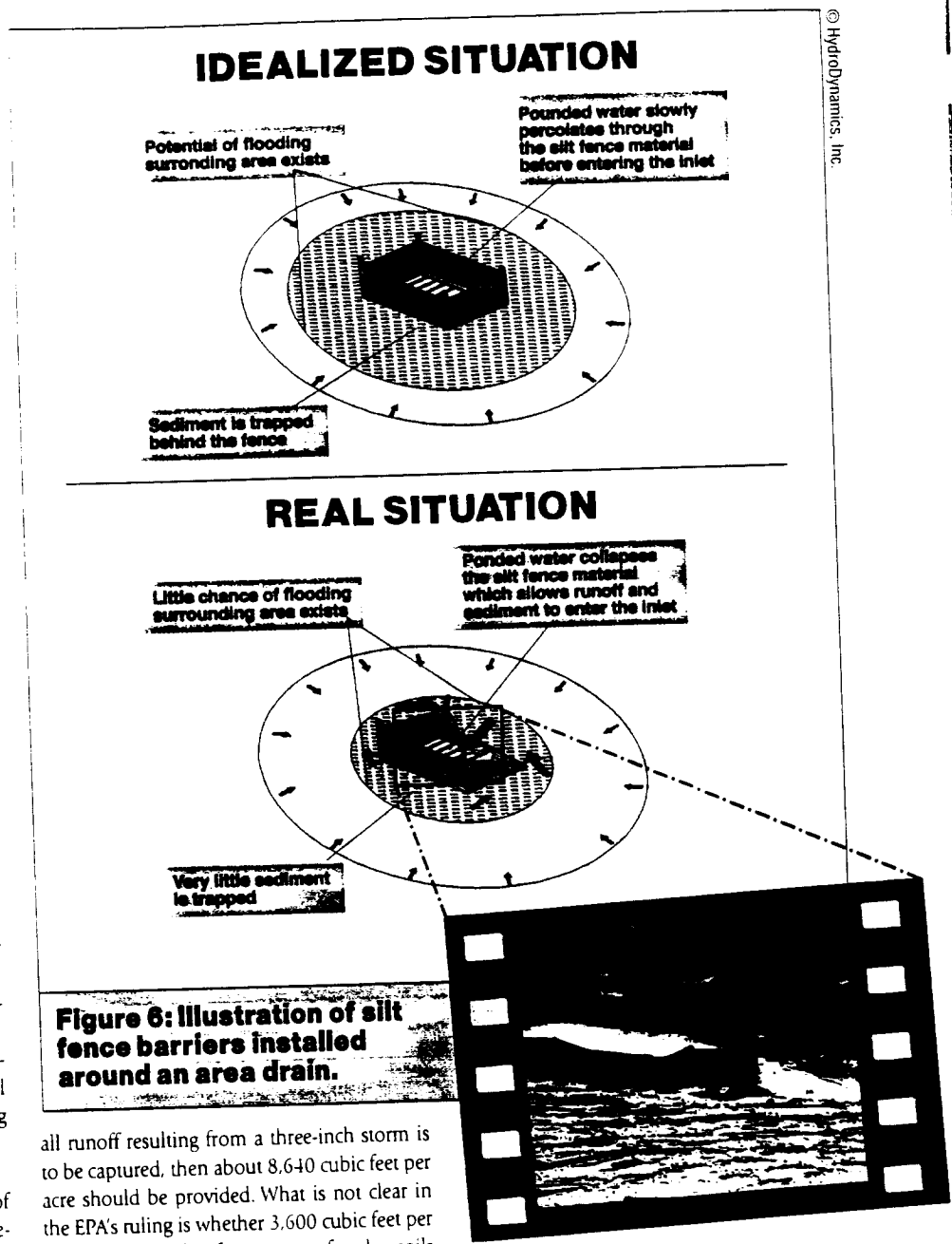

Figure 6: Illustration of silt fence barriers installed around an area drain.

Perhaps the answer to this dilemma lies with evaluating the second part of the EPA ruling. Providing storage for runoff caused by a local two-year, 24-hour storm event is very practical in arid and semi-arid environments. For example, if a two-year, 24-hour storm event of 1.6 inches falls on clay soils, then 3,600 cubic feet of storage per acre disturbed will be required. All other soils will require less storage to accommodate runoff. For example, a construction site in loamy clay soils will only require about 2,880 cubic feet per acre.

What happens to this criterion in the nation's humid regions? Consider Nashville, Tenn., where the two-year, 24-hour event is about 3.5 inches of precipitation. If a construction site consists of loamy clay soils, then Figure 10 demonstrates that about 2.6 inches of runoff will occur. When a containment system is constructed to accommodate this runoff, then about 9,360 cubic feet per acre of storage will be required.

Which storage volume should designers select — 9,360 cubic feet or 3,600 cubic feet per acre? The larger value satisfies one of the EPA requirements for a two-year, 24-hour storm event. However, if the smaller value is selected, then well-intentioned BMP criteria

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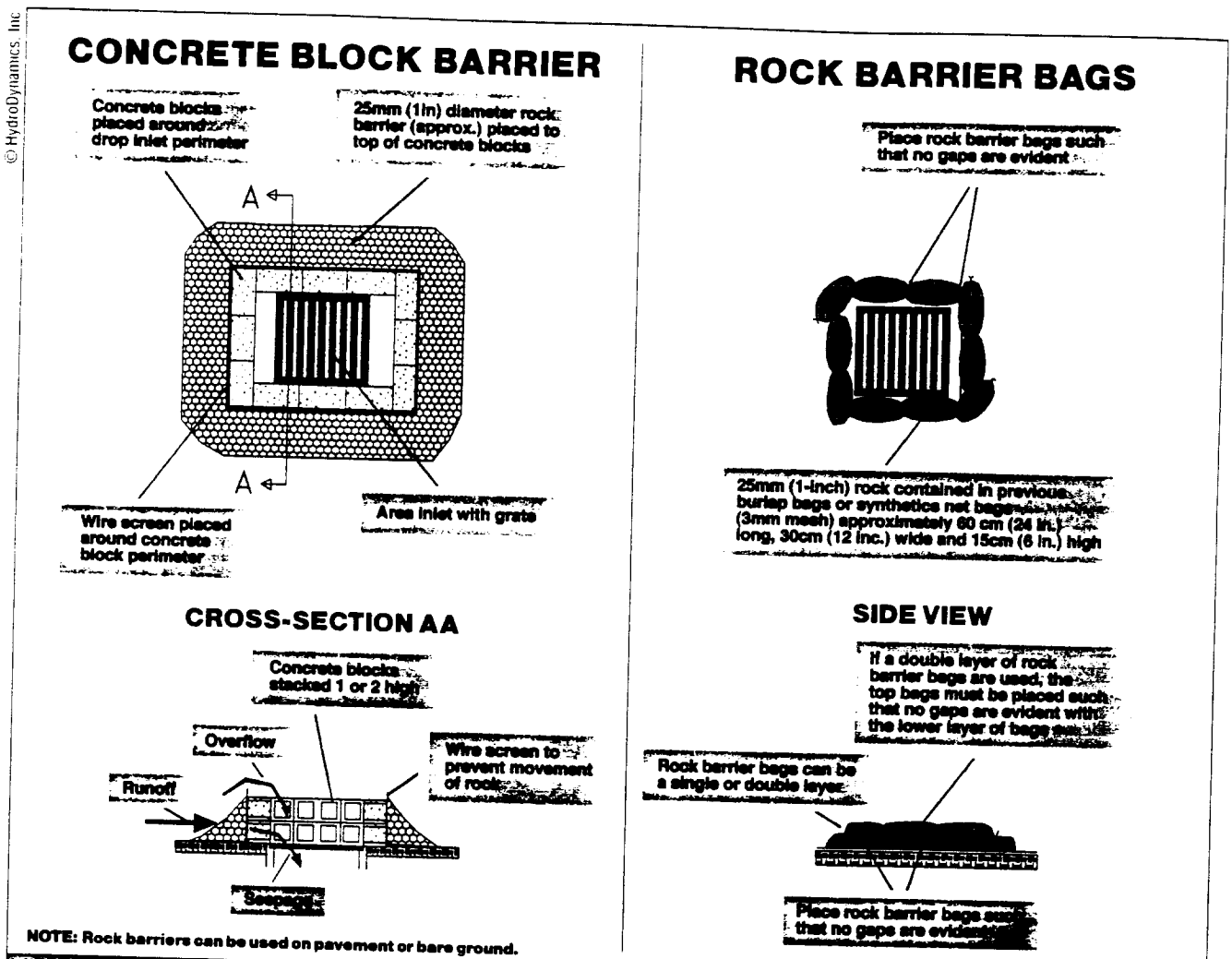

Figure 7: Illustration of a rock barrier around an area drain.

may result in development of a worst management practice.

It is the author's opinion that the design of sediment containment systems based upon a two-year, 24-hour storm event is achievable for most of the nation. However, what may not be reasonable is requiring development of a system based upon a storage volume of 3,600 cubic feet per acre disturbed. The following criteria was demonstrated by the author as necessary for effective sediment containment systems:

1.) A "reasonable" design size particle to capture must be selected.

2.) Size distribution of upstream soil particles must be evaluated.

3.) Inflow and outflow from the system for a specific frequency storm event must be known.

4.) Pond volume is directly proportional to the discharge rate of water from the system.

5.) Pond volume is inversely proportional to the mass of the design size suspended particle.

6.) A system must provide sufficient flow lengths to allow for deposition of design size particles.

Also demonstrated was that while sufficient volume is necessary, it is not the most important sediment containment system parameter. Instead, Figure 6 is the most important parameter.

Should a 25 acre Nashville construction site have a 5.4 acre feet sediment containment system required by the EPA for a two-year, 24-hour storm event? Or will 2.1 acre feet be sufficient? Only by incorporating the six items listed above will it be possible to design an effective containment system to address these questions. In this manner, a required BMP on a construction site will not become a worst management practice.

If reduction of sediment in runoff from construction sites is to occur, it is important that limitations be recognized with all structural and non-structural methods. Many of the common BMPs found on construction sites may be increasing, instead of decreasing, environmental damage. Consequently, designers, regulatory personnel, contractors, and inspectors must recognize when mitigation will function as BMPs and when they will be worst management practices. ■

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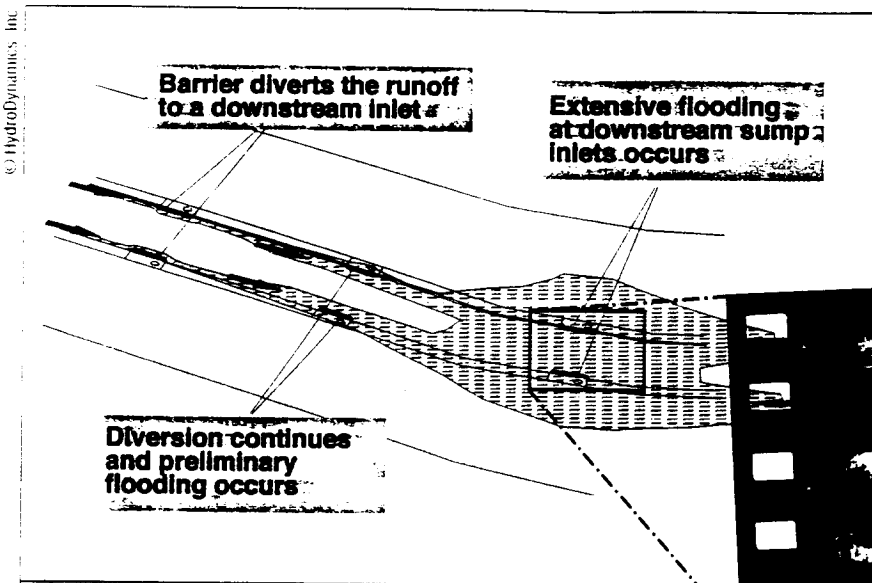

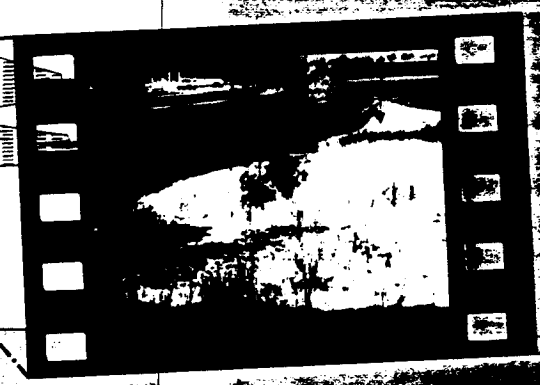

Figure 8: Illustration of how rock barriers in front of inlets divert runoff water.

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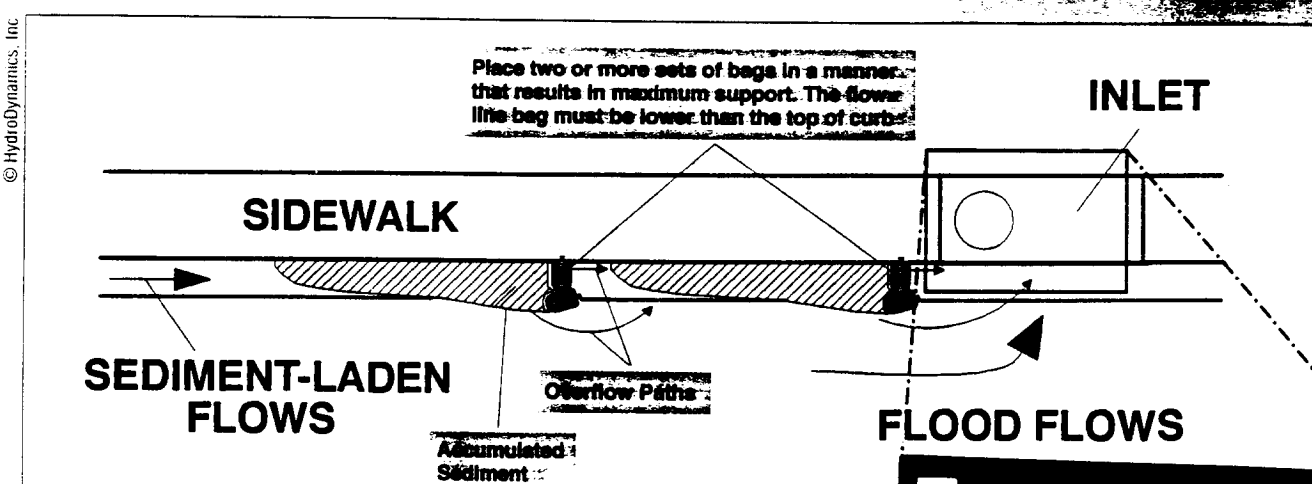

NOTE: Bags must be partially (about 2/3) full.



Figure 9: Illustration of a curb and gutter sediment trap.

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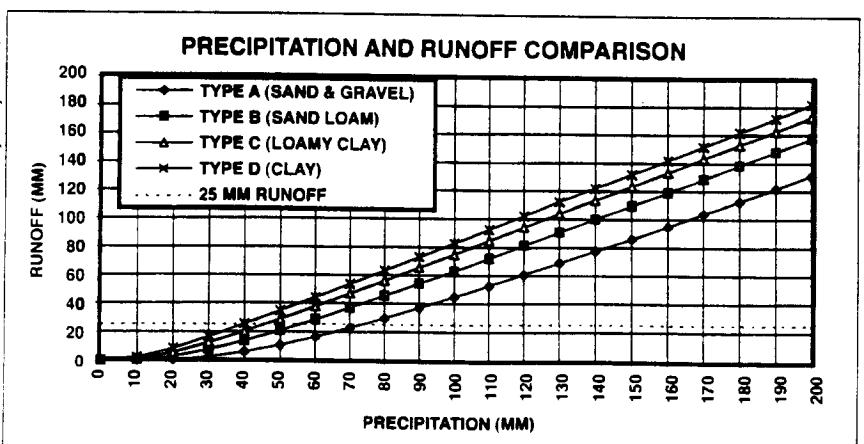

Figure 10: Illustration of precipitation and corresponding runoff for different soil types as calculated by the Soil Conservation Service curve number method.

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URBAN RUNOFF POLLUTION – SUMMARY THOUGHTS – THE STATE-OF-PRACTICE TODAY AND FOR THE 21ST CENTURY

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ABSTRACT

A number of papers at this conference were presented on quality aspects of urban runoff. In addition, three workshops addressed Urban Best Management Practices (BMPs), Highway Runoff, and Megacities in the 21st Century, respectively. Several well-known presenters expressed conflicting views on fundamental issues regarding BMP adequacy and the proper approach to urban runoff quality management. Upon reflection, the author believes that the conflicting opinions result principally from two related facts: 1) there is no accepted uniform design criteria for BMPs, so that various authors are comparing apples and oranges; and 2) the objectives of the management practices differ between authors. This paper responds to those conflicting views, with some reflections on the state-of-practice in the three subject areas, based upon some of the presentations in the conference sessions and in the workshops. © 1999 IAWQ Published by Elsevier Science Ltd. All rights reserved

KEYWORDS

BMPs; cities; developing countries; highways; stormwater; stormwater quality; urban runoff; water quality.

STATE-OF-PRACTICE FOR URBAN BMPS

One of the first observations on the state-of-practice that comes to mind when one listens to different speakers talk about their experience with urban BMPs, is that there is no common basis for design of the so-called "structural" BMPs (extended detention basins, retention ponds, wetlands, infiltration devices and swales). This is especially true for the hydrologic design of these facilities. The result is that reports on the performance of these BMPs contain many conflicting conclusions. For example, Thomas Schueler in his conference keynote address (paper not available) asserts that the current practice of BMP application does not protect the downstream aquatic environment. He hypothesizes that proper protection to the downstream ecosystem can only be provided by limiting the gross imperviousness of development and leaving the most upstream end of the existing stream network in its natural state, with buffer strips between the stream and the developed area to protect the stream. In contrast, Peter Stahre (see paper in these proceedings) argues that the creation of large regional water amenity facilities that receive runoff from highly impervious residential and commercial developments, drained with traditional pipe systems, is the correct approach to development of sustainable urban water resources. This argument is in direct conflict with Schueler's thesis.

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Upon closer examination of this author's approach, we find at least the following differences:

- With respect to downstream objectives, Schueler is concerned about preservation of the downstream aquatic ecosystem, while Stahre's downstream interest appears to be flood control.
- BMP design criteria used by Stahre include provision for downstream flood protection; BMP design criteria used to design the facilities examined by Schueler, do not include protection of the downstream aquatic ecosystem.
- The water and aquatic plant environment in Stahre's BMPs is designed as a community amenity; pollutant removal is a by-product of the facility, not a design feature. Schueler, on the other hand, advocates that the design of the water and aquatic plant environment in BMPs be based upon guidelines for pollutant removal.

Given these differences in BMP objective and function, it is no wonder the authors have come to opposing conclusions regarding the recommended approach to urban runoff management.

This comparison points out why there is so much controversy over the efficacy of BMPs in urban environments. First, there is no universal agreement on the objective function of BMPs, and secondly, design criteria used for the BMPs often do not address the objectives of the investigator. It is this author's opinion that most BMP installations in the world are improperly designed hydrologically and hydraulically, and until flow management and water quality management are jointly considered in BMP design, we will continue to be disappointed with their performance.

Toward better BMP design

Charles Rowney (paper not available) discussed some of the shortcomings of present design practice. It is well understood that urbanization increases both the intensity and frequency of peak flows in urban streams (see Figure 1). To alleviate this condition, the current state-of-practice is to design flood control facilities and BMPs (for pollution removal) on the basis of a "design storm" or a set of several design storms. For conditions where only flood control is addressed Rowney argues, as does this author, that less than 10 percent of the annual storms that occur on the watershed are controlled. If the 2-year storm is the minimum level of control, the facilities will regulate the runoff hydrograph in a significant way **once in two years**! This is why we observe accelerated erosion of stream channels following urbanization of a watershed. The change in the flow-frequency curve resulting from runoff management for flood control only is illustrated in Figure 2.

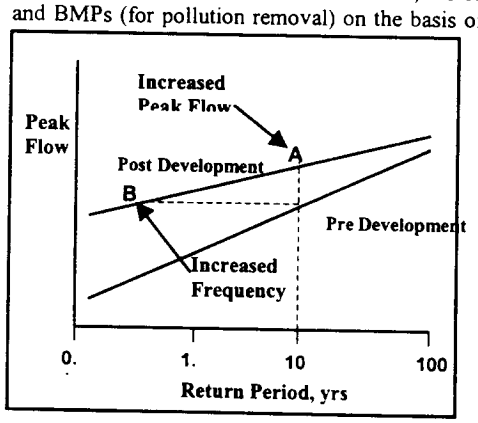

Figure 1. Effect of urban development on the flow-frequency curve.

In contrast to flood control, the water quality storm (or BMP design storm) is much smaller, typically a 1-yr storm or less. This author argues that the BMP storm should have a recurrence interval of about 3 to 4 months, since a facility sized to manage that level storm will capture and treat 75 to 85 percent of the runoff in most of the United States and Europe. Figure 3 shows, for the Edinburgh, Scotland area, the percent of the annual runoff that would be treated in an extended detention basin BMP if the basin were of different sizes. Note that

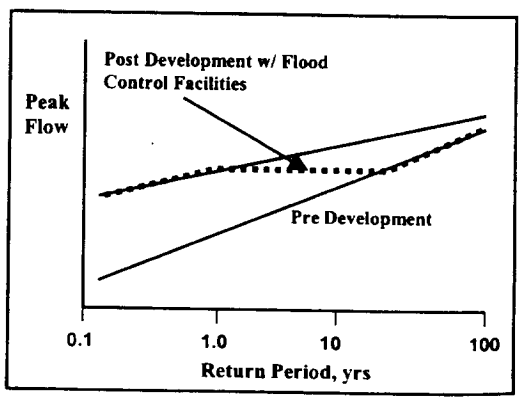

Figure 2. Effect of flood control on the post-development flow-frequency curve.

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on an annual basis 90 percent of the runoff from a typical residential area would receive treatment if only 6 mm of capture volume was provided. By contrast, the runoff from a 2-yr storm in the area is about 10 mm, nearly twice as much. So for water quality management, we are talking about facilities a fraction of the size that engineers are accustomed to designing for flood control. In Delaware, where the BMP studies used by Schueler to conclude that BMPs do not protect downstream aquatic environments, the minimum design storm for outflow control was the 10-year storm in three of the eight basins examined, while for the four others, a water quality storm of 25 mm (1 inch) of runoff was used to design extended detention into the facility as well as flow attenuation for the 2, 10, and 100-yr storms. In contrast, the water quality storm for capture of 90 percent of the runoff is 8 mm (0.3 inches) based on the hydrologic characteristics of the area (see Urbonas, Roesner, and Guo, 1996).

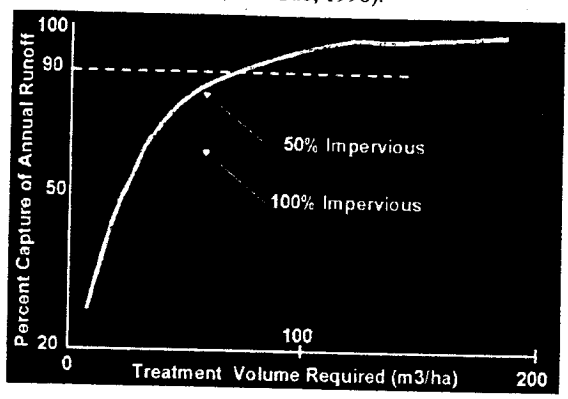

Figure 3. Annual runoff treated by various size extended detention basins - Edinburgh, Scotland.

Because few persons involved in environmental management are familiar with these facts of urban hydrology, it is more common to use a larger BMP design storm than the 90th percentile storm. There is a feeling among scientists, environmentalists, and regulators who have not been introduced to the hydrology of urban runoff, that more is better, i.e. the more runoff captured the better the quality (and by presumption the downstream aquatic environment). But

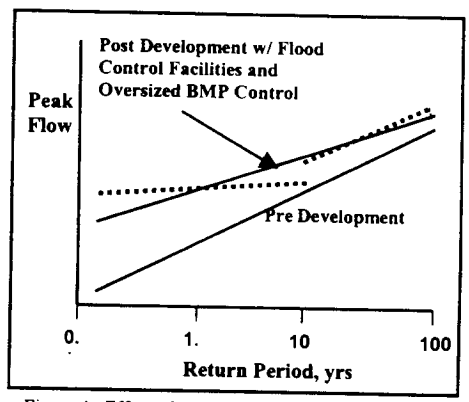

Figure 4. Effect of flood control plus oversized BMP on post-development flow frequency curve.

Rowney argues that BMP design practices focusing on only part of the spectrum of the flow frequency curve (i.e. a design storm) can lead to worsening urban stream conditions. That is, parts of the unregulated post-development flow-frequency curve may actually increase as a result of BMP construction (see Figure 4). This is due principally to the effect of back-to-back storms – a condition that increases with increasingly wet climates – on the performance of the BMP. And, the larger the water quality design storm, the more probable that this phenomenon will occur.

Special considerations for runoff pollution from highways

In the Highway Runoff Workshop, Jiri Marselek (paper included in these proceedings), produced well documented studies that show toxic effects on receiving waters are observed when traffic count exceeds 30,000 vehicles per day. The types of pollutants most observed to have a negative effect on receiving waters are copper, zinc, cadmium and lead. PAHs, pyrene, oil, etc., are also found in the runoff. Bryan Ellis in a separate presentation in the main conference (paper included in these proceedings) raised concerns that BMPs (particularly highways) might even becoming **sources** of pollutants to the groundwater. But participants at the workshop felt that if properly designed, good success could be had with BMPs in removing pollutants from highway runoff. Further review of Ellis' paper by this author, leads to the question "Are Ellis' conclusions based on BMPs that were under designed with respect to the hydrological setting they were required to operate under?" True or not, Ellis' findings point out a real deficiency in the application of BMPs to highway design; that is, the traditional highway engineer has little or no familiarity with highway runoff pollution issues.

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The design criteria for the typical BMP run contrary to all traditional design guidance provided in traditional highway drainage manuals, i.e. BMPs pond water on the right-of-way or infiltrate it; highway design criteria are developed to avoid both of these conditions so as not to create a ponded water hazard to traffic, or allow any possibility of infiltrating water into the roadway subbase. Workshop attendees pointed out that highway personnel are in general resistant to deviate from their standard highway designs because of the strict safety guidelines that have been incorporated into their development, and the liability issues associated with designs that deviate from these guidelines.

Thus, a first step for more widespread control of highway runoff must include incorporation of BMPs design guidance, suitable for application to highways, into existing design guidance manuals. We need to develop a better understanding of the water quality role of French drains and soak-aways, and develop design guidance that addresses both water quantity and quality concerns. Since much of today's highway work is renovation or expansion of existing highway systems, it is a challenge to find BMPs that can be retrofitted into tight spaces and integrated with existing drainage systems. Before BMPs implementation on highways can truly come of age, water quality engineers who understand not only BMP design and construction, but also highway design must work with transportation departments to develop design guidance documents that are compatible with the rest of the highway design criteria and teach the highway staff how to use them. For a recent example of this type of guidance, see the manuals developed for Caltrans (California Department of Transportation) by Camp Dresser & McKee Inc. (1997). Similar guidance documents have been developed for the Florida Department of Transportation (Florida DOT, 1987).

There are other issues that must also be addressed with respect to highway BMP design. Maria Viklander and Vladimir Novotny presented papers (both included in these proceedings) about the quality of snowmelt. Viklander found that the partitioning of dissolved and particle bounded substances varies by traffic load; further the snowmelt contains a very high percentage of the pollutant in dissolved form, which is the form that is toxic to the receiving water biota. Perhaps the model described by Novotny could be used to develop BMP design criteria for snowmelt treatment. However, as Viklander suggests, those BMPs might be *snow handling procedures*, i.e. "source control" rather than the "structural" (or treatment) BMPs.

The role of sustainability in urban BMP design

Sustainability as applied to a resource, is usually defined as exploitation of the resource by the current generation for their improved quality of life and standard of living, but not to the extent that it compromises future generations from achieving the same quality of life and standard of living. But sustainability is a fashionable word whose meaning varies depending upon the user, and as popularly used, it usually means "same old stuff" couched under the heading of "Developing a Sustainable Approach to ..." But Peter Stahre in his presentation to the Urban BMPs Workshop argues that developing a sustainable urban water resource system that does in fact increase the quality of life of city citizens requires a paradigm shift in our thinking about urban runoff. That is, we must cease thinking about the products of rainfall – runoff and infiltration – as nuisances, and regard them as assets. Given that in most geographies 90 percent of the rain that falls is in small storms, the urban planner, the scientist and the engineer, and the environmental regulator must take the viewpoint "What can we do with this wonderful resource to enhance our quality of life?" not "What can we do to get rid of this stuff?" By integrating stormwater management planning with green way and open space planning as Malmo is doing, we can have parks and walking paths that incorporate stormwater management facilities as water amenities, and add value to the aesthetic and recreational experience that persons gain from visiting these facilities. The land required for this type of planning is actually less than if each of these land consuming features is tacked onto community planning independent of the others.

People are naturally attracted to man-made water features, and not just natural settings. Thus, in addition to the park land type of water resource management facilities that Malmo is undertaking, it is also possible to incorporate water features into the main high density development of the cityscape. For example, incorporating a water cascade into the drainage system design of a plaza where runoff from small storms is used as a supply source is just one way of turning runoff into an amenity. One such cascade that could easily lend itself to adaptation for this purpose is the water cascade at the central train station in Oslo Norway. An architecturally designed water cascade that parallels the steps up to the train station entrance

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from the plaza below could easily be adapted to convey storm water from the upper plaza to the lower plaza. Since the cascade has a permanent pool on the lower plaza, water can be recirculated during dry weather to maintain a continual water feature. Landscape architects Herbert Drietsel (1999) and William Wenk (1999) present a variety of similar ideas for this type of intra-city water management, aesthetically integrating runoff management into the architectural design of urban developments. But doing this on a large scale requires innovative thinking and attitudes on the part of all parties involved it the development and management runoff: municipal officials, developers, design engineers, and regulators.

In the Urban BMPs Workshop, Stahre introduced a template for creating sustainable urban water resource systems. To begin with we must take a new look at urban stormwater management, combining fundamental "know how" with community values as illustrated in Figure 5. This results in conceptual **new solutions** to urban water resource management.

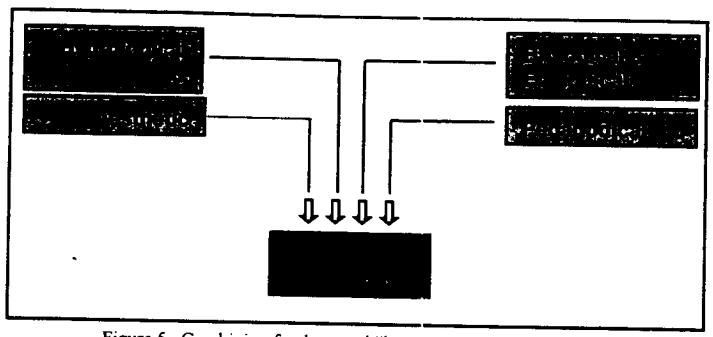

Figure 5. Combining fundamental "know-how" with community values leads to new solutions.

The process for taking these new solutions "from vision to realization" is illustrated in Figure 6. The first step is to apply our environmental and engineering resources to integrate the new solutions objectives into our urban master plan. Once this is done, it is essential that the municipal planners and engineers partner with the local community, including public service providers and private enterprise so that all individuals who are stakeholders in the urban planning and management process

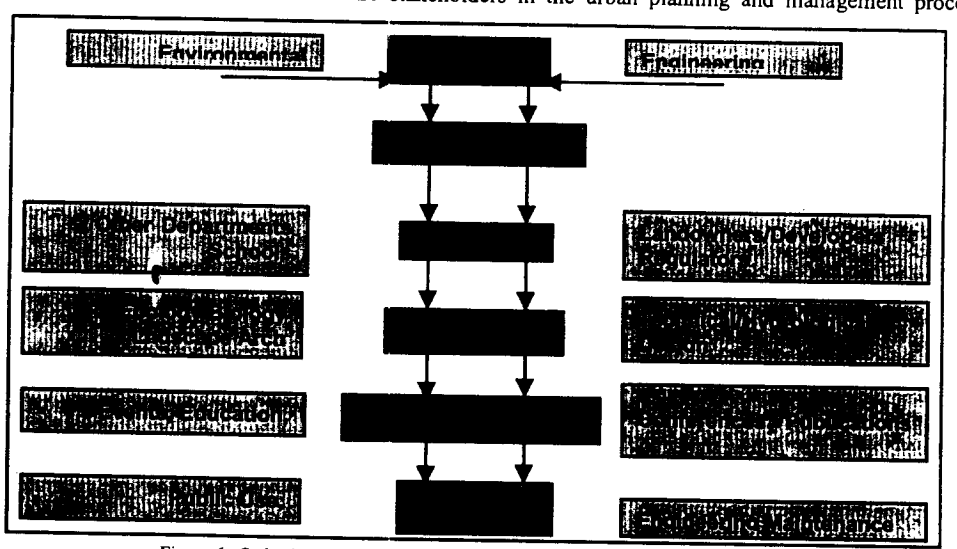

Figure 6. Stahre's template for transforming visions for new solutions to reality.

participate and buy in to the new plan. Once that partnering occurs the master plan is reviewed and refined and proposals are actually put forth for specific urban water resource management projects. The design of these projects includes ecological and biological criteria, along with landscape architecture, technical and hydrological design criteria. These proposals are then presented to the public at large through public information events, education, media participation to the lay citizenry, while engineers and technical participants in the projects are educated through presentations at engineering conferences and papers in

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technical publications. Once public participation and support has been garnered for the project, the project can be built. Realization of the vision occurs through community use and enjoyment of the facility, remaining sustainable as long as the facility is properly maintained.

That's nice, but what about the real issues

The above discussion on new solutions and sustainable urban water resources sounds great during the conference, but back in the office on Monday morning, I am still faced with the same old burning questions:

- What about the land take?
- Who's going to be responsible for the maintenance?
- Who accepts the liability if there is an accident involving one of these urban water features?
- What if the sediment is contaminated with pollutants?
- Will these BMPs perform as advertised?

So what's the answer?

The answer is that we won't know until we try. But rather than try to argue the whole program out before we construct or change anything, let's develop some well thought out pilot studies that will give us insight into these issues. Proper monitoring of the cost and performance of these pilot facilities is of paramount importance. Having some real experience in your own community is of great value in selling a new program to municipal officials, the community developers and regulators. Create a public database to show results and develop better engineer design guidance documents based on the results of these pilots. Bring the public into projects. Introduce them to the project and explain its purpose; and welcome their suggestions, because public involvement builds community confidence and acceptance for these new solutions.

STORMWATER MANAGEMENT IN MEGACITIES IN THE 21ST CENTURY

Guy Pegram from South Africa presented a paper on Megacities in the 21st Century with some very sobering statistics. These are the following:

- **1996** – The worldwide urban city population numbered 2,500 million people, which is 43% of the world population; there were 290 cities with populations over 1 million people.
- **2025** – The worldwide urban city population will number 5,500 million people, or 61% of the world population; there will be 400 cities with populations over 1 million people.
- **90 percent of this growth will be in developing countries.**

Workshop attendees thinking they were going to talk about runoff pollution problems in London, Paris, Tokyo, and New York City suddenly discovered that the issues these cities face in the year 2025 are fairly diminutive compared to issues that the Third World cities are facing. The visual aids used by the speaker to show the abject poverty where these people live and the woefully poor water and waste infrastructure available to them leaves one feeling rather hopeless and depressed about the present, let alone the future possibilities of improving the quality of life for these millions of people. But as workshop attendees recovered from their initial shock and depression over the seeming hopelessness of the situation and the lack of influence that they could have on improving the situation, a number of ideas and proactive avenues for useful contributions began to surface.

There is no doubt that the developing countries do not have the technical or financial resources to develop and operate the water infrastructure management technologies of the industrialized world. This applies not only to stormwater but also the drinking water supply, and solid waste and wastewater disposal. We have demonstrated through past aid projects and continue to demonstrate with current projects that the traditional approach where we apply our industrialized nations hi-tech solutions to these countries is not practical or economical. These people have neither the education to operate the facilities, nor the financial resources to maintain them. In addition, many of the "lo tech" ideas, thought up in our western civilized ivory towers are not well accepted by the people and for obvious reasons: the solutions do not fit their culture.

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So why is it that when we want to implement new infrastructure ideas in our western civilization, we involve all the community stakeholders and achieve their buy-in before proceeding with a project; but when we decide to implement new infrastructure ideas for Third World communities, we simply install the technology and expect them to gratefully use it. People in Third World communities are no different than those in industrialized communities with one exception: the people in the industrialized communities have money. But as human beings, we are both the same, and we must work with Third World communities the same way that we work with our own communities to develop and implement new solutions. That is, we must follow the Stahre Templates previously illustrated in Figures 5 and 6 and discussed in the previous section of this paper. We must work with individual communities to develop new solutions (Figure 5) to the Third World infrastructure dilemma, then work alongside the community leaders to implement these solutions (Figure 6). We cannot impose external solutions on the culture.

Toward an improved future

The engineering community in developed countries, let alone Third World countries does not commonly practice application of the Stahre Templates. Therefore, to succeed in providing an improved future for Third World cities, we must address the five items shown in Table 1. Each item is briefly addressed below.

People Issues - To develop workable urban water infrastructure solutions, we must consult and partner with individual communities to develop new approaches that factor in the ideas and beliefs, culture, religion, etc. of the community. We need to partner with the leaders of the community and work with them to find workable solutions. We must then work with the people to develop support for these solutions and reinforce behavioral modifications necessary to apply these solutions effectively in their culture and environment. This approach applies to water supply, waste disposal and stormwater management.

Table 1. Issues to be addressed for Improving Infrastructure Services to Third World Cities

- People Issues
- Leadership
- Education
- Political Issues
- Communication

Leadership - We as professionals need to take a leadership position in advocating this approach to our peers, municipal officials, and regulators both in the Third World cities and in the international aid agencies that provide funding to these cities. We must work with municipal governments and regional and national governments to gain their support for implementation of these new solutions. We need to find leaders within the communities themselves, who understand the problems, and have a desire to solve them. Partnering with these leaders is the only way to achieve our implementation goals.

Education - Having gained leadership support we need education. Technical training and research is needed at colleges and universities on viable urban water (and waste) management solutions for Third World urban communities. We need to learn and teach indigenous technologies. We must educate the community itself that is school children, community leaders, etc. And, we need to educate the aid funding agencies of the world that traditional solutions to these problems will not work and they should fund their money on finding innovative new solutions that include partnering with the local community.

Political/Institutional Issues - Political issues also need to be resolved. We need leaders in governments and funding organizations to understand the need for new solutions to infrastructure development in Third World cities, so that infrastructure projects in these urban, low-income, socioeconomic areas can be developed and funded. We need these organizations to reorganize themselves in terms of their ability to deal with and manage the infrastructure issues in these environments.

Institutionally, municipalities need to revise ordinances and building codes with respect to developing infrastructure for water supply, drainage, wastewater, and solid waste. Many of these municipalities had patterned these ordinances and codes after those of the industrialized communities, but such codes and ordinances are often counterproductive to achieving pragmatic infrastructure development in impoverished communities

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Communication - We need to communicate this message to our peers, to international aid agencies, the government officials responsible for spending aid money, and leaders in local Third World communities. Through conversation and papers presented at multidiscipline conferences we can communicate these needs and ideas to our peers. Holding conferences on this subject in the Third World countries themselves is one way to communicate this information. We must present papers that propose new solutions, and report on the results of applications of these new solutions. We need to focus on projects that do not work as well as projects that do work in order to advance the state-of-practice as quickly as possible. Finally, we must market these solutions so that all parties involved with water supply, drainage and waste disposal infrastructure to Third World cities will understand and implement these practices.

REFERENCES

Camp Dresser & McKee Inc. (1997). *Caltrans Stormwater Quality Handbooks*, Camp Dresser & McKee Inc., Ontario, California.

Drietsel, H. (in press). The Role of Water In Our Cities, *Sustainable Urban Water Management for the 21st Century*, Proceedings of an Engineering Foundation Conference, Malmo, Sweden, American Society of Civil Engineers, 1999.

State of Florida Department of Transportation (1987). *Drainage Manual*, Volumes 1-3.

Maxted, J. and Shaver, E. (1996). The Use of Detention Basins to Mitigate Stormwater Impacts on Aquatic Life, *Impact of Stormwater Runoff on Water Quality and Aquatic Biota*, Proceedings of an Engineering Foundation Conference, Snowbird Utah, American Society of Civil Engineers.

Urbonas, B. R., Roesner, L. A. and Guo, C. Y. (1996). Hydrology for optimal sizing of urban runoff treatment control systems. *Water Quality International*.

Wenk, W. E. (in press). Stormwater as Civil and Ecological Urban Framework, *Sustainable Urban Water Management for the 21st Century*, Proceedings of an Engineering Foundation Conference, Malmo, Sweden, American Society of Civil Engineers, 1999.

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Storm Water: Asset or Liability

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Introduction

It is ironic that modern cities tend to shunt away the rain that falls on them while they import fresh water from distant streams and reservoirs.

-- Ferguson and Debo 1990

It has long been the public perception that stormwater in an urban setting is a liability and large flood control structures should be built to protect the public. Thus, public agencies have designed and constructed flood control facilities with one primary objective: protection of the public. While this is the most important objective of stormwater management, there is another side of stormwater management that has been relatively ignored — viewing stormwater runoff as an asset for use in replenishing aquifers and other non-flood control uses (recreation, wildlife enhancement). To view stormwater as a multi-use resource, a comprehensive stormwater management plan is required that accounts for the physical characteristics and constraints of the watershed.

The development of a comprehensive stormwater management plan for a watershed requires that the underlying hydrology of the watershed, both on the surface and underground, be completely understood. The driving forces in the hydrologic cycle are precipitation, infiltration, and evaporation. In the Southern California area, the majority of precipitation occurs in the winter months (i.e., December through March). In addition, there is tremendous spatial variability of precipitation in the Los Angeles basin. In the mountains surrounding Los Angeles, the total annual precipitation is two to three times greater than the precipitation in the coastal plain. The Los Angeles - San Gabriel Rivers drainage basin covers 1,460 square miles, from the San Gabriel Mountains to the Pacific Ocean (Figure 1).

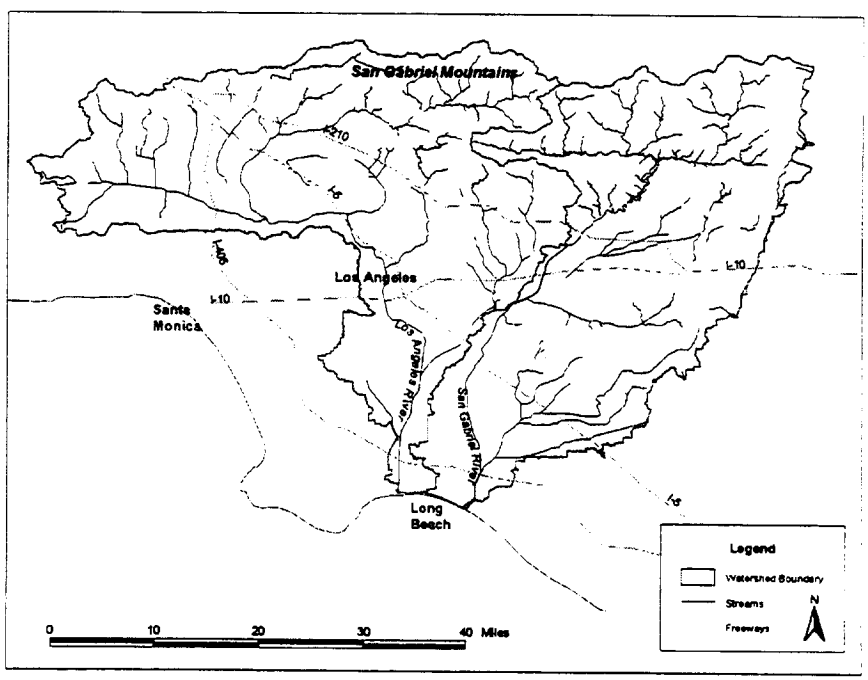


Figure 1: The Los Angeles-San Gabriel Rivers drainage basin.

In response to damages from the flood in 1934, the U.S Army Corps of Engineers in partnership with Los Angeles County Flood Control District (the County) began construction of a comprehensive flood control system consisting of detention/retention basins, channel improvements, pumping plants, and local storm drains. With minor exceptions, the river channels are concrete lined trapezoidal channels, entrenched in the upper reaches and controlled by levees and rip-rap in the lower reaches. The system was designed to serve a projected population of three million with much of the upper watershed (i.e., San Fernando Valley) to remain largely agricultural land.

In the past 50 to 60 years, there has been extensive development in the Los Angeles - San Gabriel Rivers watershed which has created a vast amount of impervious surface areas due to buildings, roads, driveways, parking lots and sidewalks. This has substantially changed the hydrology and runoff processes in the watershed. Studies have shown that runoff in an area of 75-100 % impermeable cover increases by a factor of nine when compared to an area with natural cover. In the Los Angeles - San Gabriel rivers basin, the storm drain system that was originally designed to convey the 100-year storm, now only provides 25 to 40 year protection in some portions. The large amount of impervious space in the watershed has increased the volume of runoff, and the timing of the peak flow rate is much faster than before.

The increase in runoff due to urbanization is clearly seen in Figure 2, which presents the ratio of runoff to precipitation for the Los Angeles River watershed. From the 1930s to the mid 1960s, the percentage of rainfall that infiltrated into the ground or evaporated was more than 80% (20% of the rainfall was converted into runoff). Since the mid 1960s, this ratio has steadily decreased and now approximately 50% of the rainfall is infiltrated or evaporated and the other 50% is runoff which goes to the ocean.

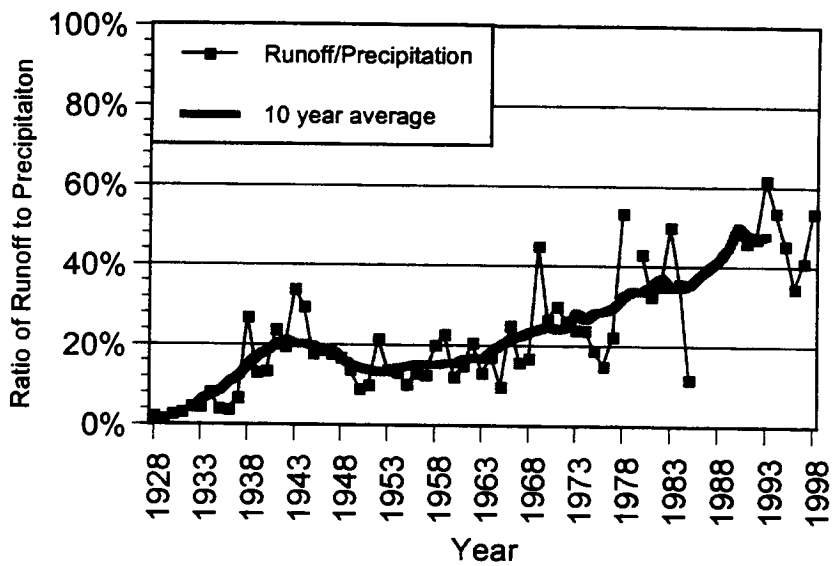


Figure 2: The ratio of annual runoff in the Los Angeles River at Firestone Blvd. to the annual precipitation at the Los Angeles Civic Center from 1928 to 1998.

There is a growing realization that the traditional approaches to stormwater management have not always worked well and in some instances the engineered solution made the situation worse. The flooding in the Mississippi River basin in 1993 forced some communities to move out of the floodplain to higher ground. Furthermore, the flood crests at St. Louis were up to 3 meters higher than a flood from an earlier storm of the same magnitude because of the constricting effect of the upstream levees. In 1986, flooding in Sacramento was due in part to errors in the operation of the Folsom Dam which is a major-flood control reservoir upstream of Sacramento. [1]

This paper reviews traditional and non-traditional approaches to stormwater management and explores some potential opportunities for alternative stormwater management techniques in the Los Angeles - San Gabriel Rivers watershed. This approach to stormwater management views stormwater as an potential asset, while at the same time keeping protection from the liability of stormwater as a primary objective. The focus of this paper is the reduction of total volume and velocity of stormwater entering the drainage systems, primarily through techniques that capture or slow runoff at its source.

Traditional Approaches: Conveyance and Storage

Because natural drainage and storage processes have been altered by urbanization, stormwater management systems attempt to compensate for increased runoff and decreased infiltration and act as substitute for the role of the natural floodplain. The traditional design of stormwater systems has focused on using conveyance and storage facilities to control the runoff during a major storm event (based on historical rainfall or runoff). The traditional flood control system consists of engineered structures such as a network of curbs, gutters, underground pipes, and open channels. Since the 1970s, there has been a trend to incorporate storage facilities (detention and retention basins) into the system that detain or retain the storm runoff, releasing it at a controlled rate into the conveyance system[2].

This approach to stormwater management considers stormwater to be a liability that is best gotten rid of as efficiently as possible in channels that use the minimum amount of space. This has worked well in many instances and has met the primary objective of the flood control system -- protection of property from storm runoff. These facilities, however, were designed for a single purpose (flood control) and only incorporated other benefits (e.g., recreational, environmental, water conservation) that were feasible for their location.

The design criteria for these traditional stormwater systems varies depending on the magnitude of the "design storm" (the maximum rainfall event that the system should be capable of managing), the size of the facility, and the community's desire for a high level of flood protection. In Los Angeles County, if the watershed area of the drainage facility is greater than 100 acres or a natural watercourse, then the system is designed for a 50-year storm event. Otherwise, in urban areas, the combination of street capacity and storm drains is to afford a 25-year level of protection. Lastly, the Federal Emergency Management Agency (FEMA) Flood Insurance program requires that all communities have 100-year flood protection. In developed areas, all finished floor elevations of proposed habitable structures must equal or exceed the water surface of the predicted 100-year flood. These design criteria

may seem to be conflicting; however, the County criteria is applicable to local storm drain facilities and the FEMA criteria applies to regional facilities, such as the Los Angeles River.

Conveyance Facilities

Conveyance facilities are designed to move water on or below the surface through a series of gutters, catch basins, pipes, and open channels. This is the oldest, most efficient, and most common approach to stormwater management. The components in the system are designed to move the water as quickly as possible and without obstruction[3]. The facilities were often designed to not allow water to infiltrate into the soil due to limited space requirements and incompatible soil characteristics. Furthermore, the facilities are engineered to minimize the amount of space required to convey the water. Thus, the facilities are economical and are hydraulically efficient -- minimal width of the channel and minimal roughness.

Flow velocity is a function of the size of the channel, the slope, and the roughness of the channel surface area. The impact of channel roughness on the flow capacity of a channel is demonstrated in Figure 3. The capacity of the channel is inversely proportional to the roughness of the channel. Thus for a given channel width, if the capacity of a concrete-lined channel is 10,000 cubic feet per second (cfs), then the capacity of a grass-lined channel with the same dimensions is 4,000 cfs. The smooth, concrete-lined channel might be adequate to meet the flood control needs of the community; however, it often limits uses during dry periods. A grass-lined channel would have to be larger in size to provide the same level of flood protection. A grass-lined channel that is the same size as the concrete channel would only partially meet the flood control needs of a community, but it could be a multipurpose facility that could be used for other activities during dry periods.

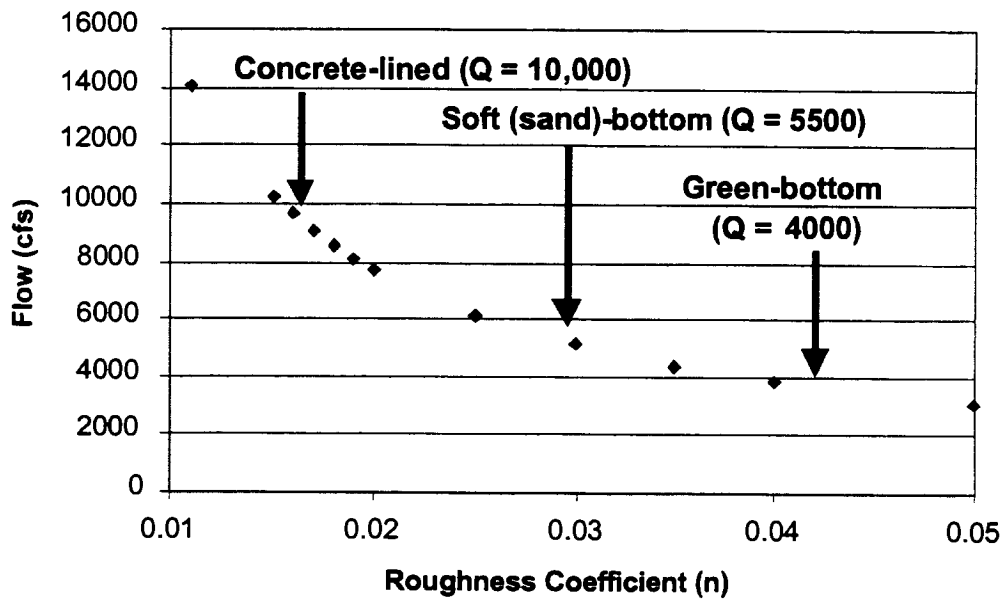


Figure 3: The effect of channel roughness on the channel capacity for a hypothetical trapezoidal channel. The x-axis is the Manning's roughness coefficient (n).

Detention Basins

The function of a detention basin in a flood control system is to reduce the peak runoff that occurs during major rainfall events, but the total storm volume conveyed by the system remains unchanged. Figure 4 demonstrates the impact of a detention basin on the magnitude of the peak runoff and the change in the hydrograph (amount of runoff over time). The peak flow rate is substantially reduced and the shaded area in Figure 4 is the amount of runoff volume that is detained in the basin.

Detention basins can be "wet" basins that have additional capacity reserved for detention of storm runoff or "dry" basins that use all of the capacity to detain storm runoff. The wet basins are typically multipurpose facilities that are used for recreational activities when flood risk is not imminent and liability related to the public use is minimal.

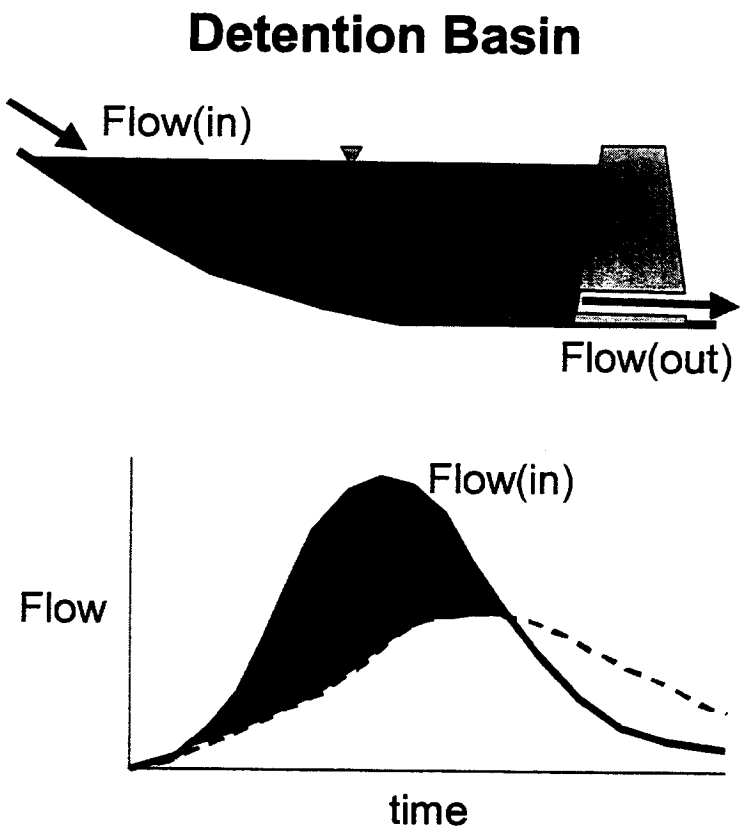


Figure 4: The impact of a detention basin on a storm hydrograph. The flow into the detention basin is the solid line and the flow out of the basin is the dashed line.

Retention or Infiltration Basins

The other type of stormwater basin used in flood control systems is a retention or infiltration basin. This type of basin reduces the total volume of storm runoff by allowing a portion of the runoff to infiltrate and recharge the groundwater. The infiltration of stormwater collected in the basins also restores the baseflow in streams and filters pollutants out of the stormwater[4].

Retention basins can be designed directly in the flow path of the channel or the basin can be "off line" where flows are diverted out of the main flood control channel. The stormwater in a retention basin does not return to the downstream channel or waterway.

Non-traditional Approaches: Reducing Volume and Velocity

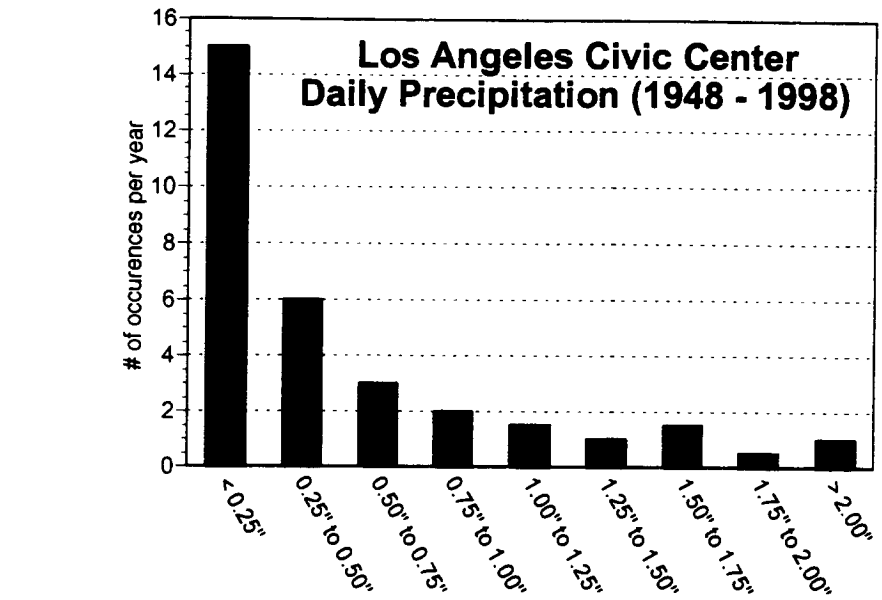
Rethinking Traditional Approaches

There are a number of reasons to reevaluate approaches to stormwater management: water conservation, environmental concerns, desire for more open space, costs, and increasing awareness of the indirect impacts of traditional systems. Single purpose conveyance systems are increasingly viewed as throwing water away. They typically do not address other watershed management concerns such as water quality, channel erosion, ground water recharge or reclamation of surface runoff. Channelization disrupts the local water balance and the natural functions and habitat of a stream[5].

The primary focus of stormwater systems has been the need for flood control and public safety. Flood control and stormwater management are still evolving sciences, yet the infrastructure isn't always adaptable to new research findings. Traditional conveyance methods merely allow the flood to move elsewhere at a faster rate; they do not reduce the volume of water. Traditional designs may not handle the intended volume for several reasons. For example, designs based on water moving at maximum velocity through the channel don't adequately consider the effect of the movement of sediment and debris through the channel during high flows, which changes the nature of the flow[6]. Channels require costly maintenance to clear vegetation and debris that reduce the capacity and impede flow. There may also be inadequate provisions for storm discharges that exceed the design capacity of the system, and since the urban floodplains are occupied this puts more people and property at risk[7]. As our urban population increases, so do pressures on the existing stormwater system. Reducing the volume and velocity of stormwater becomes an important and cost-effective alternative to reducing risk and extending the viability of existing regional stormwater systems.

One concept that is introduced in newer approaches to stormwater management is the idea that smaller storms that are more frequent are significant and should be evaluated when developing a stormwater management plan. Table 1 summarizes the rainfall amounts for 24-hour storms with return periods ranging from 1 year to 100 years. On average, a 24-hour rainfall amount of 2.46 inches is experienced once every two years and a 24-hour rainfall amount of 5.32 inches occurs once every 100 years. The 100-year rainfall amounts are used for design of flood control facilities; however, the lower frequency storms should also be considered in stormwater management plans. The typical 24-hour rainfall amounts are shown in Figure 5 for the 31 days of rain that the Los Angeles Civic Center experiences on average each year. Of these 31 storms, 15 have rainfall amounts less than 0.25 inches (Figure 5). Depending on the soil type and prior soil saturation, this amount of precipitation may be infiltrated in areas that have a pervious surface. Thus, one of the aims of a comprehensive stormwater management plan should be to minimize the amount of impervious land cover. This would increase opportunities for infiltration of rainfall, groundwater recharge and the

reduction of overall runoff volume and velocity. Following are a few approaches that help to accomplish these goals.



# Occurences	15	6	3	2	1.5	1	1.5	0.5	1	Total 31

Figure 5: The typical amounts of daily rainfall for an average year at the Los Angeles Civic Center based on data from 1948 to 1998.

Return Period (years)	Rainfall Amount (inches)
1	1.77
2	2.46
3	2.73
4	2.92
5	3.06
10	3.52
25	4.18
50	4.72
100	5.32

Table 1: Los Angeles Civic Center 24 Hour Precipitation for various return periods based on data from 1948-1998.

Channel Design and Operation

As discussed earlier, the size and roughness of a channel dramatically impacts the velocity of the flow. Wider channels, which provide a greater cross-sectional flow area, will slow runoff velocity[8]. In unlined channels, reducing velocity also increases infiltration, thus reducing the total channel discharge.

Another means of retaining flows in the channel is the construction of temporary dams, constructed of inflatable rubber tubing or rocks and logs. These small dams slow the velocity of the flow and allow water to pool behind them. If properly designed, the larger flood flows will safely flow over the dam without increasing the upstream flooding. When rubber dams are used in the channel, they can be inflated only when low to moderate flows are in the channel. The rubber dams can be deflated when large flows are expected, to maximize the capacity of the channel for flood control purposes.

Water Harvesting

Runoff water is detained in permanent ponds or wetlands and may be pumped from detention basins into irrigation systems, stored in tanks for fire hydrant systems, or, for smaller areas such as roofs, diverted directly into landscaped areas[9]. This is an old practice only recently rediscovered for urban use. This is a different way of looking at runoff: it directs runoff toward points of use rather than diverting runoff away from areas it could damage.

On-site Infiltration Facilities

Increasing infiltration restores a measure of the natural hydrologic cycle by returning water to the soil and reducing runoff volumes inflated by urbanization. These facilities include grass berms, drains, and subsurface percolation basins that collect and detain water on-site and allow it to infiltrate into the soil. These methods work well if soil conditions are appropriate to allow drainage and the site can be properly graded.

Cisterns or dry wells are also useful where open space and runoff volumes are limited. These facilities capture runoff from rooftops for infiltration or reuse. A dry well is a hole in the ground lined on the sides with permeable material that will hold the soil in place, and filled with coarse gravel. It must be located a sufficient distance from the building to prevent saturation of the soil under the foundation, generally at least ten feet. If designed and sized appropriately, dry wells work very well over time. A cistern is a container usually set above ground, with an outlet valve that allows it to operate in a manner similar to a detention basin. Cisterns must be covered to prevent mosquitoes from breeding and to keep out debris, and must either have a small opening or be secured to prevent access by children. To maintain capacity, the cistern must be cleaned of sediments periodically[10].

Percolation basins can be used to capture runoff from roof gutters, walkways, and for larger areas such as parking lots. Perforated pipe is laid in an excavated area, covered with a layer of gravel to provide stability, then paved or covered with soil. The drainage system directs water into the pipes, which is then allowed to infiltrate into the ground. If pollution levels are high and underlying soil conditions insufficient to filter out pollutants, water can be retained in these basins and released slowly into storm drain systems after the peak stormflow has passed.

Rooftop storage allows water to be trapped and either slowly evaporated or harvested for other uses, such as landscape irrigation or groundwater recharge. Rooftop detention basins can be part of the design in new developments, or added to existing buildings provided the roof is flat and the building capable of handling the additional weight. Existing buildings can be retrofitted by increasing the size of the rain gutters, and directing downspouts into cisterns or infiltration basins[11].

Permeable Pavements

Permeable paving can be a porous concrete surface or a type of structural support for a gravel or landscaped surface. It facilitates runoff capture and infiltration by increasing the void space in the surface and subsurface material. These surfaces have been in use since the early 1970s and are widely used in Europe and Japan. Two general types of commercial porous pavement surfaces have been developed: semi-permeable and fully permeable.

Semi-permeable surfaces have a coarse surface containing about 25% void space bonded to an impermeable underlayer. They were developed originally for airport runways to improve traction, and have been used for road surfacing as well (and have been used successfully by Caltrans). The surface tends to compact, reducing its permeability somewhat, but stabilizing at about 15% void space after two years use. Studies in Britain[12] found that the surface could potentially absorb up to 7.5 mm of rainfall when new, reducing to about 4mm over time. This storage capacity would be adequate for many typical Southern California storms, and would reduce the volume of runoff during larger storms.

Fully permeable surfaces, which have a permeable underlayer, establish a more natural runoff condition by allowing rainfall to percolate to the water table. Although they have less cohesive strength than regular pavement, they are adequate for surfacing parking lots, playgrounds and walkways. These surfaces can absorb anywhere from 5 to 25 inches of water per hour, depending on the composition of the subsurface material[13]. Porous pavement can also be used in combination with a subsurface infiltration system, such as a permeable asphalt surface on top of a gravel or stone dry well or over perforated pipe. This surface may also have some weight and traffic limitations, although some of the newer plastic systems are extremely durable and structurally stable, enough to withstand use by heavy emergency vehicles. The infiltration rates on these combined systems are only rarely exceeded, even after a succession of storms.

Permeable surface types called open-cell pavers or "grasscrete" combine a concrete or plastic grid with soil fill and grass cover. The grid provides the stability and structure, the grass traps runoff, and the soil allows infiltration. Concrete-based grasscretes are about 60% permeable, but the newer polyethylene-based surfaces provide up to 98% open surface area. Although structurally sound, these surfaces are best used for walkways or infrequent parking so that sufficient sunlight can reach the grass. Grasscrete is in use on the UCLA campus at the Anderson School of Management building along the south walkway, providing a transport route for emergency vehicles.

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Porous pavements can be as simple as cinder blocks laid end to end with the holes packed with gravel, or brick laid without mortar. These types of surfaces are not structurally suitable for anything heavier than foot traffic, and are fairly high maintenance. Depending on the type, permeable pavements can be more expensive than standard concrete or asphalt paving and require more manual labor to install and maintain. However, when the costs of the storm drainage system are added to that of conventional pavement, costs for porous surfaces become very competitive.

Grass Swales and Filter Strips

Swales and filter strips are shallow depressions or open drainage areas planted with grass or other vegetation, into which runoff is directed. They are used in highway medians, parks, homes, parking lots and many other landscaped or open space areas. Swales and strips are comparable in cost and maintenance requirements to traditional landscaping, and have the added benefits of trapping sediments and filtering pollutants[14]. The vegetation helps reduce runoff speed and absorbs rainfall.

Considerations for Implementation

Many of the approaches described above are primarily designed to reduce runoff volume by increasing infiltration rates. The success of these methods depends largely on the intensity of a given storm and the characteristics of the site: depth to groundwater, soil water holding capacity, infiltration rates, and antecedent soil moisture. Many of these techniques also trap pollutants during infiltration. EPA studies have found that if there is sufficient clearance to the water table, many of the pollutants will be removed by the soil during percolation, causing no adverse impacts on groundwater[15]. If pollutant levels are sufficiently high, for example in industrial areas, infiltration should be implemented with some pretreatment measures, such as bordering permeable surfaces with vegetation to intercept some of the pollutants[16]. In swales and infiltration basins that are planted with grass or other cover crops, incorporation of sand or peat filtration may offer a simple solution to treating runoff. Peat filters form a subsurface layer under the vegetation soil-bed: a 6-12 inch layer of peat for absorption over a sand-gravel layer for percolation. Peat can absorb many times its weight in oils and removes heavy metals and significant amounts of nutrients and bacteria from the water as it filters through[17].

On-site structural methods and more efficient site designs are most commonly employed in areas of new or redevelopment. Reducing runoff in existing developments tends to be more expensive than when it is designed into the project, although the feasibility and cost effectiveness of retrofitting is gaining legitimacy (see TREES example below). Providing groundwater recharge and diverting runoff for irrigation also reduces the need for imported water, another cost savings that is often overlooked.

Management Approaches

The so-called "non-structural" methods refer to more integrated approaches to watershed management, not to specific engineering solutions. They can take the form of planning procedures, floodplain zoning regulations, local ordinances, and design standards that encourage or require reduction of runoff through various techniques. They can apply to existing development and heavily developed floodplains, as well as to future development.

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As watershed management concepts gain attention, public agencies and communities are recognizing the potential of stormwater management systems as multi-purpose projects, not just for drainage but for recreation and riparian habitat. For example, detention basins may be used for golf courses or parks, and bicycle or equestrian trails can be added alongside stream channels. Many of the County's facilities already provide such multiple uses. However, a watershed approach to volume and velocity reduction would also aim to store and utilize stormwater and minimize discharges to receiving waters. It would detain more runoff in the upper reaches of the watershed by increasing vegetation cover, groundwater recharge basins and detention facilities so that peak flows are reduced downstream. Additionally, floodplain management that controls activity in areas subject to flooding through special zoning, permitting, public education and enforcement of flood insurance requirements will reduce both property damages and public risk.

Increasing vegetation and permeable space in the watershed reduces runoff by enhancing infiltration of rainwater, which also provides groundwater recharge. This is a long term strategy primarily applicable to new or redevelopment areas. For example, the City of Malibu allows a maximum of 30-45% permeable surface in the design of any new development, depending on the size of the lot, and encourages the use of permeable surfacing wherever feasible. There is also an increasing trend to require new developments to manage runoff to meet a specific target, such as capturing all runoff on-site during construction and ensuring that runoff does not increase overall after the development is completed.

Local Government Regulations

The **City of Santa Monica's Urban Runoff Mitigation Ordinance**, implemented in 1993, requires new development projects to incorporate design measures to reduce runoff by 20%, as well as control runoff during construction. Developers are required to submit an Urban Runoff Mitigation Plan prior to project approval. An evaluation of seven of the projects completed since the ordinance took effect indicates that nearly 1.1 million gallons of runoff were diverted from Santa Monica Bay over the 1994-95 winter season, an average of 31,000 gallons per storm. Overall, runoff was reduced at these sites an estimated 24%. As additional projects are proposed and subject to compliance with the ordinance, substantially more runoff diversion is anticipated.

The **City of Calabasas Urban Runoff Pollution Control** section of the city's development code incorporates regulations to reduce runoff volume and slow runoff flows by increasing infiltration. The provisions apply to any new development that includes grading, building new structures, or paving. Permit issuance is conditional upon approval of a Runoff Mitigation Plan that demonstrates runoff reduction of 20% by incorporating minimum area requirements for permeable surfaces and directing runoff to permeable areas for infiltration or to storage areas for reuse. Recommended measures include the use of porous paving for parking lots and walkways, diverting runoff to detention basins, drains or landscaped areas such as swales and grass strips for infiltration, or capturing runoff on rooftops or subsurface structures for reuse. The requirements are too new to evaluate, but Mitigation Plans received so far show a preference for the use of porous pavements because they are the easiest to install. There are considerations for the weight bearing capacity of some types of pavers

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however, and the prevalence of expansive clay soils in the area limits the use of infiltration inducing measures in some situations.

Los Angeles County, as a National Pollutant Discharge Elimination System (NPDES) permit holder, is required to manage municipal stormwater discharges. The County's **Department of Public Works** has developed a program to implement the requirements of the permit, and to serve as a model for the cities that are co-permitees. The program establishes guidelines for minimum standards, monitoring compliance, education and public outreach. For new or redevelopment, the program establishes Standard Urban Storm Water Mitigation Plans, designed to minimize runoff pollutants and reduce overall runoff volume by increasing on-site retention and infiltration. Some of the suggested techniques include porous paving and other alternatives to concrete, vegetated swales and buffer strips, and extended detention basins.

Non-traditional Approaches in Action

Projects in the Los Angeles area

The **Los Angeles Unified School District** recently began implementing infrastructure improvements for its 400 schools, including playground pavement repaving. With the help of TreePeople and others, LAUSD is developing a plan to reduce paved areas by 30% throughout the schools. A number of Best Management Practices are under consideration which will provide a greener, more sustainable environment, capture runoff, and reduce air and water pollutants. A pilot project has been proposed for the Osage Elementary School in Westchester which will utilize porous pavement, additional landscaping, and facilities to capture runoff on-site for reuse as irrigation water.

Long Beach Organic, a non-profit community service organization, has been facilitating community gardening and green waste recycling on vacant lots in the greater Long Beach area since 1994[18]. They are currently securing funding for a proposed plan to divert 15,000 tons of green waste destined for landfills in Los Angeles County, to use as mulch for weed abatement, water retention, bio-filtration, and creation of compost for soil amendment. The project will cover about 27 acres of vacant property in Long Beach and Signal Hill.

One of the primary goals of the project is to measure the effects of mulch and compost on runoff and soil infiltration. Mulch cover provides insulation to retain soil moisture, reducing evaporation and soil erosion. Compost can hold up to eight times its weight in water, which would not only reduce runoff but provide increased infiltration time. This project is scheduled to start as soon as funding is finalized, and will continue monitoring into 2001.

Sun Valley Watershed, a 2,681-acre watershed located north of downtown Los Angeles between Tujunga Wash and the Burbank Airport, experiences problems with flooding during heavy rains. The existing drainage system within the watershed is inadequate, but the cost of constructing a traditional storm drain to alleviate the flooding has been estimated to be $42 million. **Los Angeles County** is considering the possibility of alternative solutions in the watershed that would address the flooding problem while providing additional benefits to the community such as increased recreation, reduced flows and pollutant loads entering the Los Angeles River, increased water and energy conservation, and enhanced wildlife habitat.

Any alternative project must be able to provide the same level of flood protection without adversely impacting groundwater quality in the region. Among the solutions under consideration are retrofitting existing developments and requiring new development to capture runoff onsite, use of permeable paving where feasible, and creating detention and/or retention basins to capture runoff and provide habitat and recreation during dry periods. Support for this project is high, and a stakeholder group was formed late in 1998 to evaluate the feasibility of various alternatives. It is hoped that this project will serve as a model for flood control design in other parts of Southern California.

The Transagency Resources for Environmental and Economic Sustainability (**TREES**) project was founded by **TreePeople** in 1997 with the goal of demonstrating "the economic, environmental and social benefits gained by cooperative approaches to designing our urban landscapes as functioning mini-watersheds." The implementation of more sustainable design and management measures would result in significant reductions in imported water use, in the volume and velocity of urban runoff generated, and in the amount of pollutants carried by runoff to the ocean. The initial design session brought together engineers, landscape architects and other experts to develop sustainable landscape designs for commercial, industrial, multiple and single family residential, and public sites. A design "planbook" was produced which includes prototype designs for retrofitting these different types of development. Each design includes a variety of suggestions for accomplishing a more sustainable local environment[19].

As a demonstration of some of these ideas, a home in south Los Angeles was retrofitted with drainage, runoff storage and landscaping techniques capable of capturing rainfall from a 10-inch, one-day storm. In addition, TreePeople has developed cost-benefit modeling software which allows different design scenarios to be more easily evaluated prior to implementing solutions. The final component of the TREES project is an implementation plan which will identify investment strategies for financing retrofitting on a large scale, and encourage property owners to make their sites more sustainable. TreePeople has also been a great resource in helping to design solutions for several of the other projects discussed here.

Venice Off-Street Parking Lot projects are currently in progress by the city of Los Angeles' Architectural Division, incorporating several methods of Storm Water Management Best Practices. One of these projects is the lot used for the Venice Farmer's Market, at the corner of Venice Boulevard and Venice Way. It was recently redesigned to capture and filter runoff onsite. Strip filters surrounding the lot collect runoff for bio-filtration and groundwater recharge. The lot was landscaped to collect additional runoff and reduce the amount of "hardscape" area. The city is also installing porous paving and filtration devices in very creative ways on other sites.

Where Do We Go From Here?

This small sampling of projects illustrates the diversity of design strategies being implemented to manage stormwater runoff and reduce the need for more regional disposal facilities. There are many other examples of sustainable practices in use or in the planning stages throughout the county. This demonstrates the change of thinking that is taking place --

stormwater is starting to be considered an asset that may be put to beneficial use, while at the same time protecting the public from devastating floods.

A comprehensive watershed management plan can only be developed if appropriate tools are available to assess the different management strategies. Geographic Information Systems (GIS) are one tool that can be used to assess the cumulative impacts when different watershed management strategies are implemented in a watershed. Appendix A presents some of the data that can be used in GIS watershed management tools. The data presented in Appendix A are just a sampling of the data available for the Los Angeles - San Gabriel watershed. Future work should focus on developing new data and on using the data to assess the impacts of different watershed management strategies.

Development of new methodologies requires interdisciplinary thinking, which may require unconventional partnerships between different disciplines. A cooperative approach is needed to manage all of the individual but interrelated issues in the watershed. Reducing stormwater volume and velocity is only part of the picture, but it is an increasingly important component of a comprehensive stormwater and watershed management plan.

Notes

[1] Williams, Philip B. 1994. Flood Control vs. Flood Management, *Civil Engineering*, Vol. 64, No. 5: 51-57.

[2] Task Committee on the Design of Outlet Control Structures. 1985. *Stormwater Detention Outlet Control Structures*. New York: American Society of Civil Engineers.

[3] Ferguson, Bruce K. and Debo, Thomas N. 1990. *On-Site Stormwater Management: Applications for Landscape and Engineering*. New York: Van Nostrand Reinhold.

[4] Ferguson and Debo, 1990.

[5] Stahre, Peter and Urbonas, Ben. 1990. *Stormwater Detention for Drainage, Water Quality, and CSO Management*. New Jersey: Prentice Hall; Ferguson and Debo, 1990.

[6] Mount, Jeffrey. 1995. *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use*. Berkeley: University of California Press; *also* Williams, Philip B. 1990. "Rethinking Flood-Control Channel Design." *Civil Engineering*. Vol. 60, No. 1: 57-9.

[7] Williams, Philip B. 1997. *California's Opportunity to Achieve Improved Flood Management and Major Ecosystem Restoration*. Technical paper published on the Internet by Philip Williams & Associates, Ltd., San Francisco (http://www.edf.org).

[8] Williams, Philip B. 1990. "Rethinking Flood-Control Channel Design." *Civil Engineering*. Vol. 60, No. 1: 57-9.

[9] Geiger, Wolfgang F. 1993. "Concepts for Flood Control in Highly Urbanized Areas." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

[10] Tom Richman & Associates. 1997. *Start at the Source: Residential Site Planning & Design Guidance Manual for Stormwater Quality Protection*. Palo Alto: Tom Richman & Associates and Bay Area Stormwater Management Agencies Association.

[11] Lazaro, Timothy R. 1990. *Urban Hydrology – A Multidisciplinary Perspective*. Lancaster, PA: Technomic Publishing Co, Inc.

[12] Colyer, Peter J. 1982. "Detention storage as an equivalent rainfall depth." In *Stormwater Detention Facilities: Planning, Design Operation and Maintenance*. Conference Proceedings, ed. DeGroot, William. New York: American Society of Civil Engineers.

[13] Lazaro, 1990.

[14] Barrett, et al. "Permanent Runoff Controls." *Civil Engineering*. Vol. 67, No. 10:72-3.

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[15] Terrene Institute. 1996. *A Watershed Approach to Urban Runoff.* Washington, DC: Terrene Institute.

[16] Glick, Roger H., Wolfe, Mary Leigh and Thurow, Thomas L. 1993. *Effectiveness of Native Species Buffer Zones for Nonstructural Treatment of Urban Runoff.* Technical Report No. 156. College Station, TX: Texas Water Resources Institute. October 1993.

[17] Galli, John. 1990. *Peat Sand Filters: A Proposed Stormwater Management Practice for Urbanized Areas.* Washington, DC: Metropolitan Washington Council of Governments. December 1990.

[18] For more information on this project, contact Long Beach Organic at (562) 438-9000

[19] TreePeople 1998. *T.R.E.E.S. Project Second Nature Planbook.* http://www.treepeople.org

Appendix A:

Spatial Data for the Los Angeles-San Gabriel Watershed

A comprehensive stormwater management plan must be based on different physical data of the watershed and appropriate tools for analysis. The maps presented in Figures A1-A3 present three examples of types of data that are important in forming an alternative stormwater management plan for the Los Angeles - San Gabriel Rivers watershed. Figure A1 shows the digital elevation model (DEM) for the watershed at a 30-meter spatial resolution, which may be used to derive slope. Figure A2 shows the current land uses for the watershed and Figure A3 shows the rainfall infiltration rates, based on soil type. Other useful data may include "shrink-swell" potential of different soils, type of vegetation cover in undeveloped areas, location and depth of groundwater basins, and the spatial variability of precipitation amount and intensity.

These data can be used to identify areas where nontraditional approaches to stormwater management may be implemented. For instance, the soil infiltration rates identify those areas where it might be appropriate to place permeable pavements and onsite infiltration facilities. Identification of these areas can also be accomplished by creating hydrologic units -- combinations of soil attributes, slope, and land use -- to identify areas that have common hydrologic characteristics. Finally, these data can also be used to assess the cumulative impact of stormwater management practices in the watershed.

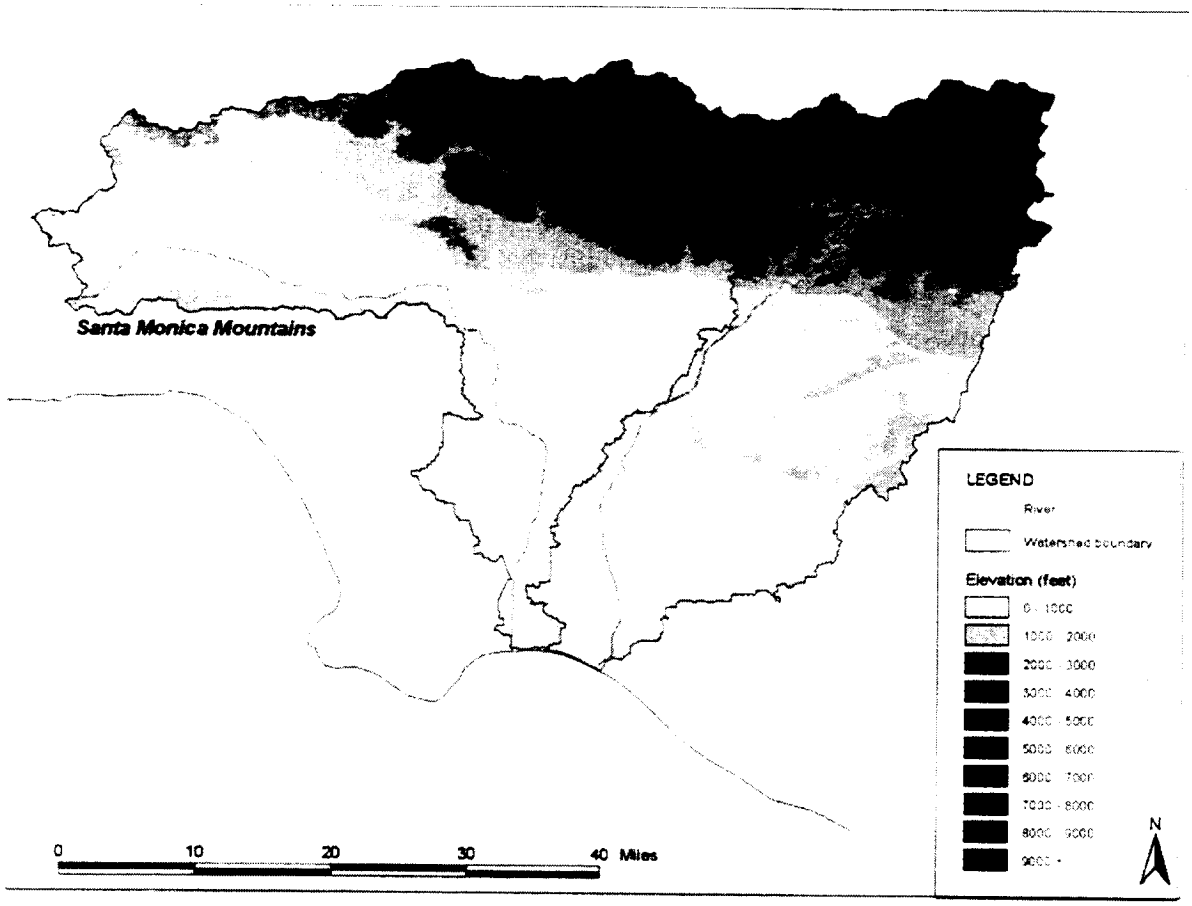

Figure A1: Digital elevation model (DEM) for the Los Angeles - San Gabriel watersheds.

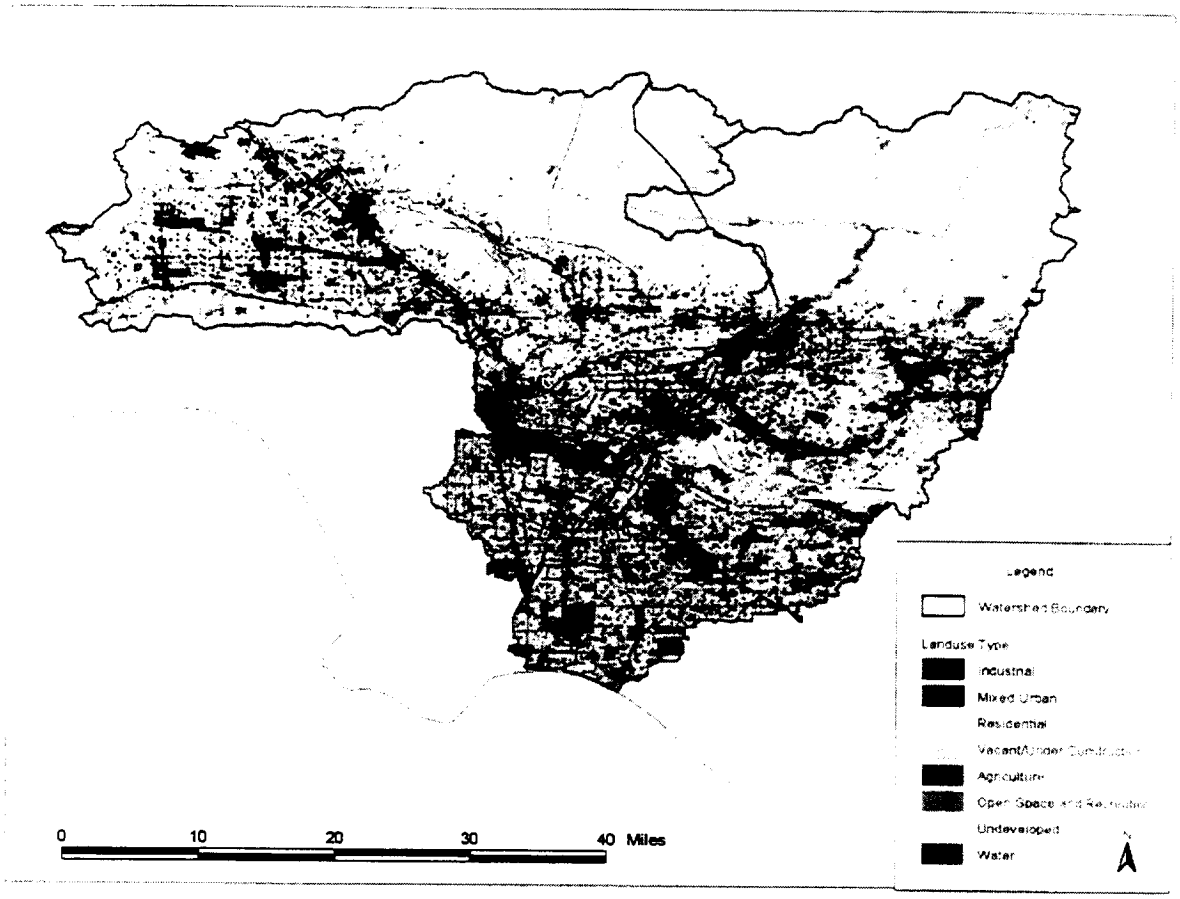

Figure A2: Current land uses for the Los Angeles - San Gabriel watersheds.

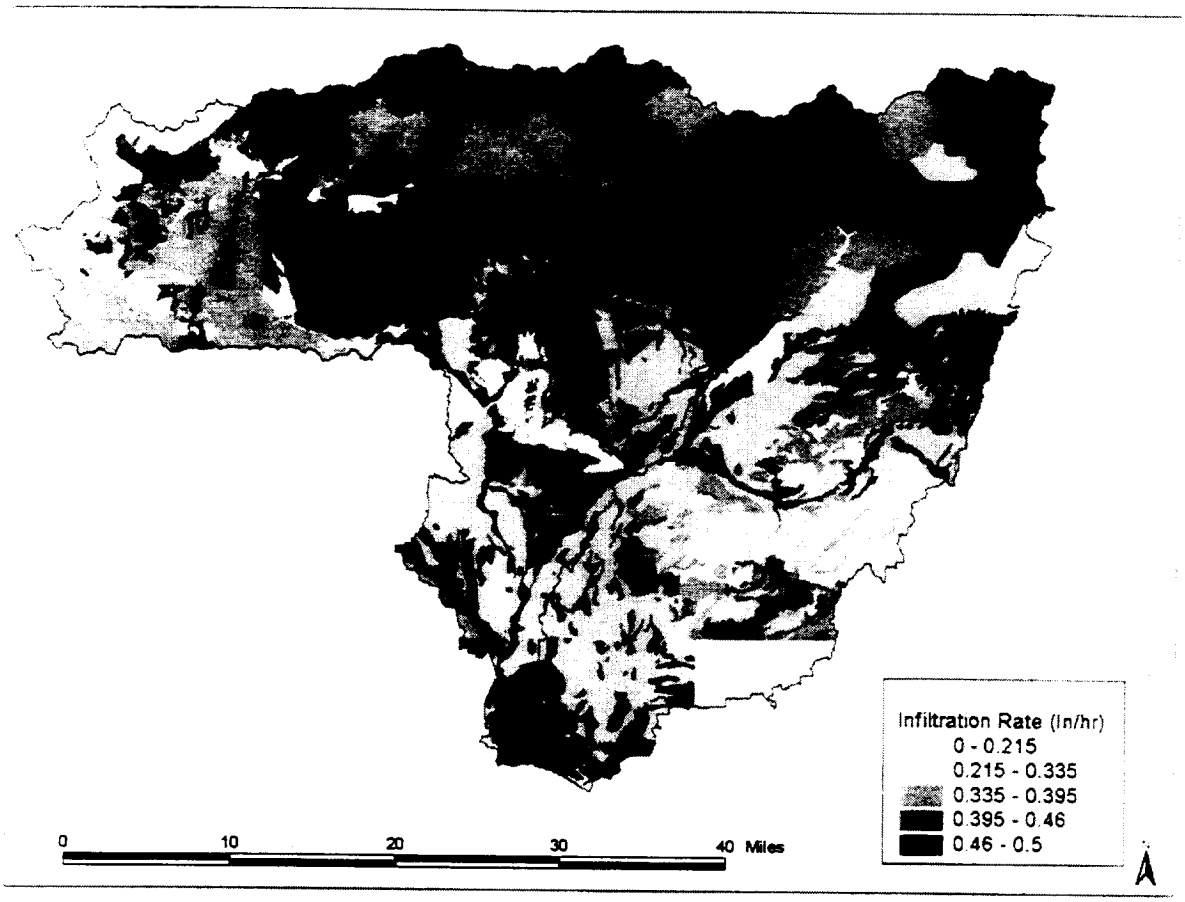

Figure A3:Infiltration rates for the Los Angeles - San Gabriel watersheds based on a 0.5 inch per hour rainfall intensity.

Appendix B:

City of Calabasas Development Code

City of Malibu Municipal Code: Storm Water Management for New Development

City of Santa Monica Runoff Control Ordinance

R0070465

CHAPTER 17.56 - URBAN RUNOFF POLLUTION CONTROL

Sections:

17.56.010 - Purpose
17.56.020 - Applicability
17.56.030 - Urban Runoff Mitigation Plan Requirements
17.56.040 - Drainage Structure Stenciling
17.56.050 - Pollution Prevention Agreements
17.56.060 - Required Best Management Practices

17.56.010 - Purpose

Recognizing the health and safety benefits of clean water, the purpose of this chapter is to ensure that activities within Calabasas add no new pollutants to our waterways and reduce present pollutant levels and sediments which are carried to our area and regional waterways through stormwater runoff. The concerns of stormwater management—to mitigate pollutant and sediment loading—will include concepts of slowing water flows to allow percolation and other filtering Best Management Practices (BMPs) to work in harmony with the topography, and ensuring that designs for pollutant management are part of the planning and approval processes of new developments. Meeting these goals can include:

A. Reducing non-storm water discharge into the municipal storm water system and area creeks by slowing runoff and maximizing infiltration.

B. Eliminating the spillage, dumping, and disposal of significant materials and pollutants into the municipal storm water system.

C. Reducing pollutant loads in storm water and urban runoff through the use of appropriate Best Management Practices.

D. Reducing the runoff of oil and gas pollutants into area storm water systems and creeks by filtration and/or bio-remediation of commercial/retail/industrial parking lots.

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17.56.020 - Applicability

A. **Applicability of provisions.** The provisions of this Chapter apply as detailed below, to any proposed land use or development involving grading activities, or the construction of new structures or paving. Compliance with the provisions of this Chapter shall be required through land use permit or subdivision conditions of approval. Any necessary pollution control measures shall be installed prior to construction, or site/structure occupancy, as deemed appropriate by the City. In all cases, the applicant/permittee is responsible for ensuring compliance with the provisions of this Chapter.

1. Applicants proposing construction on **parcels of 5 acres or more**, or any **industrial facilities** shall be required to submit a *Stormwater Pollution Prevention Plan* (SWPPP) in compliance with the requirements of the Federal Clean Water Act, U.S. Environmental Protection Agency (EPA), and the California Water Resources Board. The application shall also include a *Hazardous Materials Handling and Spill Response Plan* related to construction activities, and in the case of industrial facilities, shall also address operations after construction. The applicant shall submit a copy of the SWPPP to the City prior to the processing of any land use permit or subdivision application, or the granting of any construction permits.

2. All new or re-built retail/commercial/industrial **parking lots** shall provide a sub-surface filtering system for oil & grease contaminates as part of their application in compliance with the Administrative Policies of the City.

3. All projects shall submit a Runoff Mitigation Plan which illustrates the Best Management Practices they will be utilized to reduce stormwater flow and to prevent pollutants from running off the built project as part of the application and initial planning process.

B. **Responsibility for administration.** This Chapter shall be administered by the City Engineer or his or her designee in coordination with the Director of Planning and Building Services.

C. **Regulatory consistency.** This Chapter shall be construed to assure consistency with the requirements of:

1. The Federal Water Pollution Control Act, 33 USCS § 1251 et seq., and the applicable implementing regulations;

2. The mandates and rulings of the US Environmental Protection Agency (EPA);

3. The NPDES permit of Los Angeles County and its "co-permitees";

4. The Calabasas General Plan; and

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5. Other existing or future NPDES Permits and any amendments, revisions or reissuance thereof by either Federal, State, County, or City regulatory agencies.

17.56.030 - Urban Runoff Mitigation Plan Requirements

The following runoff reduction requirements shall apply to all persons submitting applications for New Development within the City, whether fulfilled by the Federal SWPPP format, by the less detailed City *Runoff Mitigation Plan* (RMP), or as an additional measure.

A. **Submittal of Runoff Mitigation Plan.** At the time of submittal of an application for the first planning approval for a New Development project, an applicant shall be required to submit to the City Engineer either a *Runoff Mitigation Plan* to the City Engineer, or copy of Notice of Intent (NOI) filed with the Regional Water Quality Control Board.

B. **Goal for runoff reduction.** In developing a Runoff Mitigation Plan, an applicant shall demonstrate an effort to reduce projected runoff for the project by 20 percent from the base 1985 10-year storm basis, through incorporation of design elements or principles which address each of the goals set forth below in Subsections B.1, B.2, and B.3. The design elements utilized by an applicant may, but are not required to, include those provided on the list below, with the exception of Subsection B.2.b which is required where applicable. Although design elements are set forth as if they address only one goal, in many cases they address more than one and can be used to address multiple goals in achieving the reduced runoff to be achieved by the mitigation plan.

1. **Increase permeable areas.** The following measures shall be used to increase the permeable areas on the site.

    a. To slow runoff and maximize infiltration, the percentage of a project site shown in the following table shall be permeable area, based on the applicable zoning district. The area may include vegetation, pervious paving materials and porous materials for or near walkways, which increase the amount of runoff seepage into the ground. Permeable surface materials can include wood decking materials, brick or stone with spaces to allow percolation between stones, and similar methods.

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MINIMUM PERCENTAGE OF SITE AREA REQUIRED TO BE PERVIOUS SURFACE, BY APPLICABLE ZONING DISTRICT

Zoning District or Development Feature	Minimum Pervious Surface
RS - Sites of less than 1/3 acre	50%
RS - Sites of 1/3 acre or more	65%
RM - Multi-family projects	45%
RM - Mobile home parks	25%
HM	86%
RR	70%
RC	65%

Zoning District or Development Feature	Minimum Pervious Surface
CL	28%
CR	22%
CO	24%
CB	28%
CT	28%
CMU	38%
All parking lots	30%

b. Use natural drainage, detention ponds or infiltration pits so that runoff may collect and seep into the ground and reduce or prevent off-site flows;

c. Divert and catch runoff through the use of drainage swales, berms, green strip filters, gravel beds and french drains; and

d. Construct driveways and walkways from porous materials to allow increased percolation of runoff into the ground.

2. **Minimize runoff.** Minimize the amount of runoff directed to impermeable areas and/or maximize storm water storage for reuse:

a. Install rain gutters and orient them towards permeable surfaces rather than driveways or nonpermeable surfaces so that runoff will penetrate into the ground instead of flowing off-site;

b. Modify grades of property to divert flow to permeable areas and to minimize the amount of storm water leaving the property;

c. Use sediment traps to intercept runoff from drainage areas and hold or slowly release the runoff, with sediments held in the trap for later removal;

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d. Use retention structures or design rooftops to store runoff. Utilize subsurface areas for storm runoff either for reuse of to enable release of runoff at predetermined times or rates to minimize the peak discharge into storm drains. Cisterns are also a possible storage mechanism for reuse; and

e. Design curbs, berms or the like so as to avoid isolation of permeable or landscaped areas.

3. **Reduce parking lot pollution:**

a. All parking lots are required to use oil and water separators or clarifiers to remove petroleum-based contaminants and other pollutants which are likely to accumulate;

b. Direct runoff toward permeable areas and away from pollutant laden areas such as parking lots; and

c. Construct portions of parking lots from porous materials.

C. **Criteria for evaluation of mitigation plans.** The City's evaluation of each Urban Runoff Mitigation Plan will ascertain how well the proposed plan meets the combined goals set forth in Subsection B. above. Each plan will be evaluated on its own merits according to the particular characteristics of the project and the site to be developed.

D. **Waiver of Runoff Mitigation plan.** Full or partial waivers of compliance with this Section may be obtained by persons who apply on forms supplied by the City and show that incorporation of design elements that address the objectives set forth in Subsection B., above is an economic and physical impossibility due to the particular configuration of the site or to irreconcilable conflicts with other City requirements. Requests for waivers shall be granted or denied, in writing, by a three-member board comprised of one representative each from the City's Planning Division, City Engineering Department, and City Manager's Office. Their decision shall be forwarded to the Council for final approval.

E. **Compliance as condition of approval.** Compliance with an approved Runoff Mitigation Plan shall be a condition of approval of any required planning approval.

F. **Erosion control.** Erosion shall be controlled as follows:

1. All construction sites shall provide a plan to prevent erosion during construction to be approved by the City Engineer; and

2. Sloping lots shall provide soil holding plants as part of their ongoing landscape maintenance and planting for erosion control will be part of their *Water Conservation Landscape* plans. (See the Water Conservation Landscape Ordinance.)

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G. **Hazardous and toxic materials control.** The use of toxic and hazardous materials shall be controlled as follows:

1. Industrial facilities shall file a copy of their Hazardous Materials Handling and Spill Response Plan with the City Engineer;

2. Restaurants shall provide the City Engineer with appropriate plans for handling grease which may include bio-remediation; and

3. Commercial, industrial, retail and multi-family developments will provide a plan for reduced use of pesticides and herbicides as part of their Water Conservation Landscaping plans.

17.56.040 - Drainage Structure Stenciling

Where a catch basin or other drainage structure is required for a proposed project, written and/or graphic information discouraging the dumping, discarding, and/or discharge of pollutants into the storm drainage system shall be permanently affixed to the structure in a location approved by the City Engineer. The information shall be painted, stamped into the concrete, or provided on a metal plaque affixed to the structure as approved by the City Engineer or his or her designee.

17.56.050 - Pollution Prevention Agreements

Prior to final building inspection, or the filing of a Final Map, as applicable, the applicant shall enter into a Pollution Prevention Agreement with the City or other agency designated by the City. The agreement shall include, but is not limited to, the following provisions:

A. Authorization for the City or other agency designated by the City to inspect on-site pollution prevention facilities with respect to the accumulation and concentration of pollutants, garbage and/or debris, so as to prevent the discharge of pollutants, garbage and/or debris into streets and/or the storm drainage system;

B. Fair share participation in the periodic cleaning of storm drain facilities, increases in street sweeping, and increases in the emptying of roadside trash receptacles resulting from the project;

C. Fair share participation in the funding of the City's Public Information and Education Program(s) for the disposal of waste, recycling, and water conservation; and

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D. Requirements that any applicable conditions, covenants, and restrictions (CC&Rs) include statements encouraging homeowners, and persons in control of homes and businesses to:

1. Prevent the improper disposal of litter, lawn/garden clippings and pet feces into streets or other areas where runoff may carry pollutants into the storm drainage system;

2. Remove dirt, trash and debris from sidewalks and alleys that may contribute pollutants to urban runoff;

3. Recycle oil, glass, plastic, and other materials to prevent improper disposal into the storm drainage system;

4. Properly dispose of household hazardous waste to prevent improper disposal into storm drainage system; and

5. Properly use and conserve water.

17.56.060 - Required Best Management Practices

The owner, occupant or other person in charge of day-to-day operation of each premises within the City shall implement the best Management Practices or use Good Housekeeping Practices, as applicable, as follows.

A. For premises with parking lots with more than 25 parking spaces exposed to stormwater and which parking lots are associated with industrial or commercial activities, according to the United States Office of Management and Budget Standard Industrial Classification Code, the owner, occupant or other person in charge of day-to-day operation shall use BMPs to reduce the discharge of pollutants to the maximum extent practicable. Such measures may include rear sweeping or other measures, if effective.

B. For premises where machinery or other equipment which is repaired or maintained at facilities or activities associated with industrial or commercial activities, according to the United States Office of Management and Budget Standard Industrial Classification Manual, the owner, occupant or other person in charge of day-to-day operations shall use BMPs or other steps to prevent discharge of maintenance or repair related pollutants to the MS4.

C. For other premises exposed to stormwater, the owner, occupant or other person in charge of day-to-day operations shall use BMPs, if they exist, or other methods to reduce the discharge of pollutants to the maximum extent practicable, including the removal and lawful disposal of any solid waste or any other substance which, if it were to be discharged to the MS4, would be a pollutant, including fuels, waste fuels, chemicals, chemical wastes and animal wastes, from any part of the premises exposed to stormwater.

5408. Requirements for Industrial/Commercial and Construction Activities.

Each industrial discharger, discharger associated with construction activity, or other discharger described in any general storm water permit addressing such discharges, as may be issued by the U.S. Environmental Protection Agency, the State Water Resources Control Board, and the Regional Board shall comply with all requirements of such permit. Each discharger identified in an individual NPDES Permit shall comply with and undertake all activities required by such permit. Proof of compliance with any such permit may be required in a form acceptable to the Authorized Enforcement Officer prior to the issuance of any grading, building or occupancy permits, or any other type of permit or license issued by the City.

5409. Storm Water Management Plan for New Development.

A. Prior to issuance of a building permit for any new development (on undeveloped land) or final map approval for any subdivision of property the applicant shall be required to have approval of a Storm Water Management Plan from the Department of Public Works and the Department of Environmental and Building Safety.

B. The Stormwater Management Plan shall incorporate the following elements:

1. Construction Erosion Control - as required under Article VIII, Chapter 1, Section 7010 - Building Regulations of this Code.

2. Storm drainage improvement measures to mitigate any offsite/downstream negative impacts due the proposed development. This includes, but not limited to;

a) Mitigating increased runoff rate due to new impervious surfaces through on-site detention such that peak runoff rate after development does not exceed the peak runoff of the site before development for the 100 year clear flow storm event (note; Q/100 is calculated using the Caltrans Nomograph for converting to any frequency, from the Caltrans "Hydraulic Design and Procedures Manual"). The detention basin/facility is to be designed to provide attenuation and released in stages through orifices for 2-year, 10-year and 100-year flow rates, and the required storage volume of the basin/facility is to be based upon 1-inch of rainfall over the proposed impermeable surfaces plus 1/2-inch of rainfall over the permeable surfaces. All on-site drainage devices, including pipe, channel, and/or street & gutter, shall be sized to cumulatively convey a 100 year clear flow storm event to the detention facility, or;

b) Demonstrating by submission of hydrology/hydraulic report by a registered engineer that determines entire downstream storm drain conveyance devices (from project site to the ocean outlet) are adequate for 25-year storm event,

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or;

c) Constructing necessary off-site storm drain improvements to satisfy (b) above, or;

d) Other measures accomplishing the goal of mitigating all offsite/downstream impacts.

3. Storm drain pollution prevention measures including all construction elements and Best Management Practices (BMP's) to address the following goals in connection with both construction and long-term operation of the site;

a) Maximize, to the extent practicable, the percentage of permeable surfaces in order to allow more percolation of runoff into the ground,

b) Maximize, to the extent practicable, retention of dry-weather runoff on-site to allow percolation into the ground, or installation of other treatment measures thereby preventing pollutants from entering the storm drain system.

C. The City's evaluation of the Storm Water Management Plan will ascertain how well the proposed plan meets the combined objectives set forth above. In addition, the City will analyze the watershed characteristics and land uses, and estimate water quality requirements for each project. Each plan will be evaluated on its own merits according to the particular characteristics of the project and the site to be developed.

D. The Storm Water Management Plan shall be approved or disapproved by the Director of Public Works and the Director of Building and Safety (or their designees) within twenty-one (21) calendar days following submittal. If the plan is disapproved, the reasons for disapproval shall be given in writing to the applicant.

E. Full or partial waivers of compliance with this Section may be obtained for development sites where it can be adequately demonstrated that the accomplishment of these storm drain management measures is an economic and/or physical impossibility due to the particular configuration of the site or due to irreconcilable conflicts with other City requirements. Requests for waivers must be approved, in writing, by the Planning Department, the Public Works Department, and the Environmental and Building Safety Department.

F. The applicant is required to comply with the approved Storm Water Management Plan.

5410. Enforcement.

A. Violations Deemed a Public Nuisance.

1. Any condition caused or permitted to exist in violation of any of the provisions of this Chapter is hereby determined to be a threat to the public health, safety and

excluded from grading limitations;

10. Development Area. Every residential development shall be contained within a convex-shaped enclosure that shall not exceed 2 acres.

11. Impermeable Coverage. Use of permeable surfaces is encouraged, especially for driveways. However, including the primary structure, impermeable surfaces are permitted for lot areas (excluding slopes equal to or greater than 1:1), up to 1/4 acre at 45%; for lot areas greater than 1/4 acre but a ½ acre or less, at 35% and for lots greater than ½ acre at 30% up to a maximum of 25,000 square feet. Beachfront lots shall not be subject to this Paragraph 11. (Ord. 93, 06-14-93)

12. Site of Construction. Structures may be constructed on slopes greater than 3:1 but less than 2 1/2:1 subject to the provisions for Section 9.4.23. (Ord. 93, 06-14-93)

13. Structure Size. Except as specifically provided herein, and as indicated on the Total Development Square Footage Structure Size Chart, the total development square footage associated with the construction of a single-family or multiple-family residence on a legal lot equal to or greater than 5 acres shall not exceed a total of 11,172 square feet. On lots 5,000 square feet or less, the total development square footage shall not exceed 1,885 square feet. Total development square footage shall be determined based on the following formula (slopes equal to or greater than 1:1 shall be excluded from the lot area calculation): for lot areas up to ½ acre, total square footage shall be 17.7% of lot area plus 1,000 square feet; for lot areas greater than ½ acre and up to 1 acre, total development square footage shall be increased by 10% of the amount of lot area exceeding ½ acre; for lot areas greater than 1 acre and up to 1 ½ acre, total development square footage shall be increased by 5% of the amount of lot area exceeding 1 acre; for lot areas greater than 1 ½ acres and up to 5 acres, total development square footage shall be increased by 2% of the amount of the lot area exceeding 1 ½ acres. For the purposes of this subsection, arbors or trellis open to the sky shall not be calculated as part of the total development square footage. Beachfront lots shall be exempt from the provisions of this paragraph 13. (Ord. 93, 06-14-93)

Reference List

Barrett, Michael, Smith, Peter and Malina Jr., Joseph. 1997. "Permanent Runoff Controls." *Civil Engineering*. Vol. 67, No. 10: 72-3.

Buchholz, Gwendolyn and Siems, Sandra. 1994. *Defining the Urban Stormwater Runoff Problem*. Walnut Creek, CA: Montgomery Watson.

Center for Watershed Protection. 1998. *Better Site Design: A Handbook for Changing Development Rules in Your Community*. Maryland:Center for Watershed Protection.

City of Calabasas. July 1998. "Urban Runoff Pollution Control," Calabasas Municipal Code - Title 17, Land Use and Development Code, chapter 17.56.

Colyer, Peter J. 1982. "Detention storage as an equivalent rainfall depth." In *Stormwater Detention Facilities: Planning, Design Operation and Maintenance*. Conference Proceedings, ed. DeGroot, William. New York: American Society of Civil Engineers.

Ferguson, Bruce K. and Debo, Thomas N. 1990. *On-Site Stormwater Management: Applications for Landscape and Engineering*. New York: Van Nostrand Reinhold.

Fisher, Gary T. and Katz, Brian G. 1988. *Urban Stormwater Runoff – Selected Background Information and Techniques for Problem Assessment, with a Baltimore, Maryland Case Study*. USGS Water Supply Paper 2347. Washington, DC: USGPO.

Galli, John. 1990. *Peat Sand Filters: A Proposed Stormwater Management Practice for Urbanized Areas*. Washington, DC: Metropolitan Washington Council of Governments. December 1990.

Geiger, Wolfgang F. 1993. "Concepts for Flood Control in Highly Urbanized Areas." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

Glick, Roger H., Wolfe, Mary Leigh and Thurow, Thomas L. 1993. *Effectiveness of Native Species Buffer Zones for Nonstructural Treatment of Urban Runoff*. Technical Report No. 156. College Station, TX: Texas Water Resources Institute. October 1993.

Harada, Shigeki and Ichikawa, Arata. 1994. "Performance of the Drainage Infiltration Strata: Statistical and Numerical Analyses." *Water Science & Technology*. Vol. 29, No. 1-2

Interagency Floodplain Management Review Committee (IFMRC). 1994. *Sharing the Challenge: Floodplain Management into the 21st Century*. Report to the Administration Floodplain Management Task Force. Washington, DC: US Government Printing Office.

R0070476

Kubani, Dean. 1996. *Sustainable City Progress Report.* Santa Monica: City of Santa Monica Task Force on the Environment.

Lazaro, Timothy R. 1990. *Urban Hydrology – A Multidisciplinary Perspective.* Lancaster, PA: Technomic Publishing Co, Inc.

Los Angeles County Department of Public Works, 1989, *Hydrology Manual*, Alhambra, California.

Miller, A. Richard. 1997. "Porous Pavement: Pavement That Leaks" WEB site article: http://MMS.TheMillers.com/

Mount, Jeffrey. 1995. *California Rivers and Streams: The Conflict Between Fluvial Process and Land Use.* Berkeley: University of California Press.

Niemczynowicz, Janus. 1993. "Integrated Water Management Background to Modern Approach." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

Roley Jr., William. 1993. Watershed Restoration and Management Model. In *Interface Between Ecology and Land Development in California.* Jon Keeley, ed. Los Angeles: Southern California Academy of Sciences.

Schueler, Thomas R., Kumble, Peter A. and Heraty, Maureen A. 1992. *A Current Assessment of Urban Best Management Practices: Techniques for Reducing Non-Point Source Pollution in the Coastal Zone.* Washington, DC: Metropolitan Washington Council of Governments. March 1992.

Sheaffer, John R. and Wright, Kenneth R. 1982. *Urban Storm Drainage Management.* New York: Marcel Dekker, Inc.

Simons, Li and Associates. 1997. *A Report on the Work of the Los Angeles River Watershed Task Force Regarding the Los Angeles River Alternative Flood Control Study.* Los Angeles: County Department of Public Works. November 1997.

Smith, April and Hahn, Kate. 1997. *Second Nature: Adapting LA's Landscape for Sustainable Living.* Marina del Rey: ReThink.

Stahre, Peter and Urbonas, Ben. 1990. *Stormwater Detention for Drainage, Water Quality, and CSO Management.* New Jersey: Prentice Hall.

Storm Water Quality Task Force (SWQTF). 1993. *California Storm Water Best Management Practice Handbooks: Construction.* Sacramento: Water Resources Control Board.

Task Committee on the Design of Outlet Control Structures. 1985. *Stormwater Detention Outlet Control Structures*. New York: American Society of Civil Engineers.

Terrene Institute. 1996. *A Watershed Approach to Urban Runoff*. Washington, DC: Terrene Institute.

Tom Richman & Associates. 1997. *Start at the Source: Residential Site Planning & Design Guidance Manual for Stormwater Quality Protection*. Palo Alto: Tom Richman & Associates and Bay Area Stormwater Management Agencies Association.

TreePeople 1998. *T.R.E.E.S. Project Second Nature Planbook*. http://www.treepeople.org

United Nations Centre for Human Settlements (Habitat). 1991. *Stormwater Drainage and Land Reclamation for Urban Development*. Nairobi: United Nations.

United States Army Corps of Engineers. 1992. *Los Angeles County Drainage Area Review: Final Feasibility Study. Interim Report and Environmental Impact Statement*. Los Angeles: US Army Corps, Water Resources Branch.

United States Environmental Protection Agency, Office of Water. 1996. *Managing Urban Runoff*. Washington, DC: US EPA.

Wada, Yashuhiko and Miura, Hiroyuki. 1993. "Prediction and Estimation of Stormwater Runoff Control by the Combined Stormwater Infiltration Facilities with Simulation Model." In *Integrated Stormwater Management*, eds. Field, Richard, O'Shea, Marie and Chin, Kee. Boca Raton: Lewis Publishers.

Williams, Philip B. 1997. *California's Opportunity to Achieve Improved Flood Management and Major Ecosystem Restoration*. Technical paper published on the Internet by Philip Williams & Associates, Ltd., San Francisco (http://www.edf.org).

_____. 1990. "Rethinking Flood-Control Channel Design." *Civil Engineering*. Vol. 60, No. 1: 57-9.

Woodward-Clyde Consultants. 1994. *Los Angeles County Drainage Area Project: Master EIR*. Santa Ana: Woodward-Clyde Consultants. December 1994.

Woodward-Clyde Consultants, Camp Dresser & McKee Inc. and others. 1997. *Model Programs for Stormwater Management Within the County of Los Angeles: Development Planning*. Los Angeles: LA County Department of Public Works. Fourth Draft, October 1997.

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To Dennis Dickerson
FYI
McKeston

Better Site Design: Changing Development Rules to Protect the Environment

QUALITY CONTROL BOARD
ANGELES REGION

By Thomas R. Schueler and Richard A. Claytor, Jr., P.E.

Reduced impervious surface and different drainage techniques can result in significant environmental benefits.

Few stormwater management practices simultaneously reduce pollutant loads, conserve natural areas, save money, and increase property values. Indeed, if such "wonder practices" were ever developed, they certainly would spread quickly across the nation. As it turns out, these practices have existed for years. Collectively called "better site design," the techniques employ a variety of methods to reduce total paved area, distribute and diffuse stormwater runoff, and conserve natural habitats. Despite their proven benefits, however, better site design techniques often fail to earn the endorsement of local communities. In fact, many communities simply prohibit their use.

"Better site design" describes a fundamentally different approach to the design of residential and commercial development projects. It seeks to accomplish three goals at every development site: to reduce the amount of impervious cover, to increase the amount of natural land set aside for conservation, and to use pervious areas for more effective stormwater treatment. To employ these methods, designers must scrutinize every aspect of a site plan—its streets, parking spaces, setbacks, lot sizes, driveways, and sidewalks—to see if any of these elements can be reduced in scale. At the same time, creative grading and

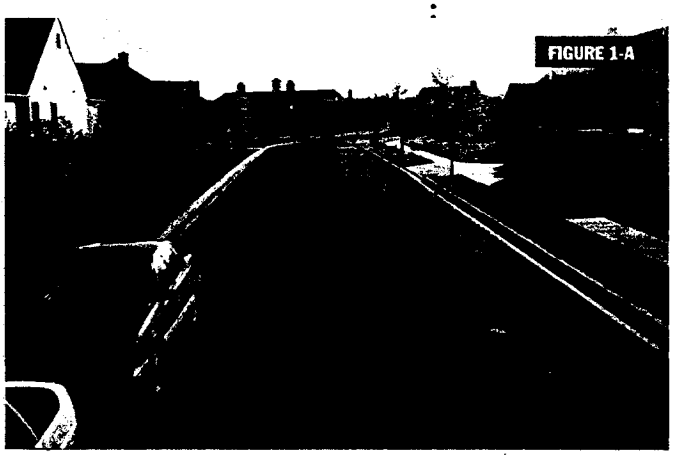
FIGURE 1-A

Narrow residential streets require less land and less paving materials.


FIGURE 1-B

An open-section street with a mildly sloped, shallow swale eliminates the need for curbs and provides areas for stormwater runoff.


FIGURE 1-C

Commercial parking lots designed with low parking demand ratios and narrow drive aisles require less land.


FIGURE 1-D

Shared driveways for single-family residential lots use less land and less paving material.

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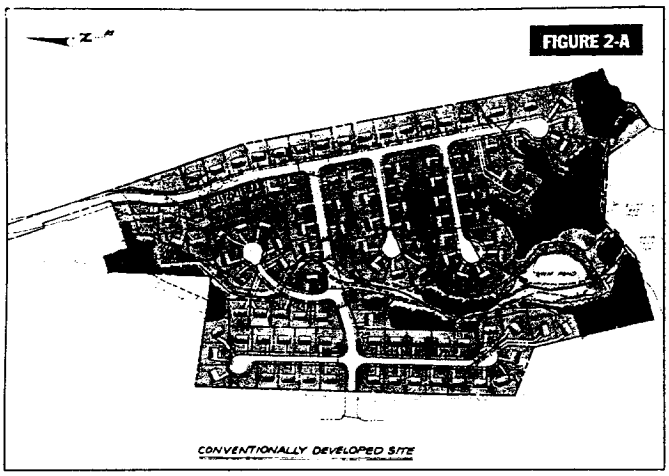
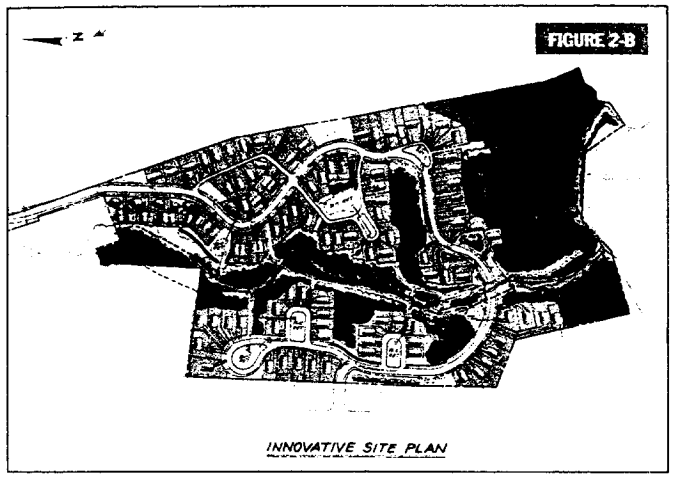


This plan of the 108-acre Stonehill Estates in Stafford County, Virginia, demonstrates a conventionally developed site. The average lot size is 9,000 square feet; 25 percent of the site is open space; street widths are 26 and 34 feet; and the cul-de-sac radii are 45 feet.



Stonehill Estates, designed with an innovative site plan, shows that the 108 lots' average area is reduced to 6,300 square feet with 44 percent open space. The street widths are reduced to 14 feet (one-way) and 26 feet (two-way), with 14-foot-wide looping cul-de-sacs.

drainage techniques can prevent concentrations of stormwater, thereby encouraging more infiltration. Finally, undisturbed land areas conserved as forests, meadows, stream buffers, or other natural habitat areas can increase available open space, enhance property values, and reduce pollutant loads. Figures 1a through 1d illustrate some of these principles.

When all these techniques are applied simultaneously, the cumulative benefits of better site design can be impressive. For example, recent studies in Delaware, Maryland, and Virginia have demonstrated that better site design can reduce impervious cover by 25 to nearly 60 percent for a range of subdivisions. Other studies have shown that better site design reduces impervious cover by about 20 percent in shopping centers and office parks. Table 1 illustrates the potential reductions for various residential development densities. Figures 2a and 2b depict alternative designs for Stonehill Estates, a development in Virginia.

Less impervious cover translates directly into smaller pollutant loads. In fact, studies have shown that better site design produces 40 to 65 percent less phosphorous and nitrogen loads than conventional site designs—roughly the equivalent of what can be removed by a well-designed stormwater pond. The same studies have also demonstrated that better site design costs 5 to 20 percent less to build than conventional site design.

The Center for Watershed Protection recently compared the infrastructure cost of four projects that relied on standard development strategies with the same sites developed in accordance with innovative site design techniques. Table 2 illustrates these cost comparisons.

Why, then, is it so difficult to implement better site design in so many communities? The primary reason is that outdated development rules collectively govern the development process—the bewildering mix of subdivision codes, zoning regulations, parking and street standards, and other regulations that often work at cross-purposes and yield less-than-ideal results. With few developers willing to invest in something that may take years to be approved or that may never be approved at all, experiments in better site design are rare.

A new movement, however, may make better site design easier. Developers, water quality managers, and planners are taking steps to rethink land development rules in many locations across the country. For example, transportation, public works, safety, planning, and engineering organizations involved in the development industry recently participated in a national site planning roundtable and developed a nationally accepted set of model principles that foster better site development. The group embraced a total of 22 model development principles to help further better site design at the local level.

The national site planning roundtable is serving as a model for local government implementation of better site design principles. Recently, Frederick County, Maryland, initiated a local roundtable to take a critical look at its own development rules. Members of the development community in partnership with local planning and zoning and public works staff are meeting to identify and overcome impediments to better site design that are embedded in the county's codes and ordinances. The outcome of the consensus process should be development rules that encourage rather than discourage the application of better site design techniques.

Changing local development rules is not

TABLE 1. **Analysis of Residential Developments Employing Better Site Design Techniques**

Development Project	Development Density	Impervious Cover at the Site: Conventional Site	Impervious Cover at the Site: Better Site Design Site	Impervious Cover at the Site: Net Change	Percent Reduction in Stormwater Runoff
Tharpe Knoll[1]	1-acre lots	13%	7%	–46%	44%
Pleasant Hill[1]	½-acre lots	26%	11%	–58%	54%
Stonehill Estates[2]	⅓-acre lots	27%	21%	–22%	25%
Belle-Hall[3]	High density	35%	20%	–43%	31%

Sources: [1]Delaware Department of Natural Resources and Environmental Conservation, 1997; [2]Center for Watershed Protection, 1998; [3]South Carolina Coastal Conservation League, 1995.

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TABLE 2. **Comparison of Infrastructure Costs Associated with Four Development Projects Redesigned to Incorporate Better Site Design Principles**

Site	Development Category	Cost Savings (percent) and (net dollars)	Notes
Duck Crossing	Low-density residential (8 lots of approximately 3 acres each)	12% ($17,000)	Savings mainly from reduced paving surfaces
Stone Hill Estates	Medium-density residential (108 lots at approximately 1/3-acre each)	20% ($300,000)	Savings from reduced paving, curb and gutter, sidewalk, and sanitary sewer; stormwater management slightly more costly with redesigned site
270 Corporate Center	Commercial office park (250,000 square feet)	5% ($36,000)	Savings from reduced paving, sidewalks, sanitary sewer and water; curb and gutter and stormwater management slightly more costly with redesigned site
Farm Brook	Retail shopping center (71,500 square feet)	3% ($27,700)	Savings from reduced paving, sidewalks, storm drain, water, and sanitary sewer. Stormwater management, curb and gutter more expensive with redesigned site

Source: Center for Watershed Protection, 1998

easy. Progress toward better site development will require more and more local governments to examine their current practices in the context of a broad range of concerns, such as how changes will affect development costs, local liability, property values, public safety, and a host of other factors. Advocates of better site design will have to answer some difficult questions from fire chiefs, lawyers, traffic engineers, developers, and many others in the community. Will a proposed change make it more difficult to park? Lengthen response times for emergency vehicles? Increase risks to the community's children? True change occurs only when the community addresses these and other questions to the satisfaction of all interests.

For more information, contact the Center for Watershed Protection, 8391 Main Street, Ellicott City, Maryland 21043; (410) 461-8323; fax (410) 461-8324; e-mail: mrrunoff@pipeline.com; website: www.pipeline.com/~mrrunoff/. ■

In 1997, the Center for Watershed Protection convened a national site planning roundtable. During the 18-month consensus-building process, a diverse cross-section of national planning, environmental, home builder, fire and safety, and public works organizations (as well as local planning officials) crafted 22 model development principles. Taken together, the principles can be applied to reduce impervious cover, conserve natural areas, and minimize stormwater pollution from new development—all while maintaining residents' quality of life.

The principles are presented in a consensus agreement entitled *Model Development Principles to Protect Our Streams, Lakes and Wetlands* and in a companion document *Better Site Design—A Handbook for Changing the Development Rules in Your Community.* The handbook contains a codes and ordinances worksheet to help communities assess which local development rules should be amended to promote better site design. The worksheet guides local planners, subdivision plan reviewers, and planning boards through a complete evaluation of their local development standards and ordinances. The consensus agreement is available on the center's web page at www.pipeline.com/~mrrunoff/. *Better Site Design* can be ordered from the Center for Watershed Protection by calling (410) 461-8323.

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References

Center for Watershed Protection (CWP). 1998. *Nutrient Loading from Conventional and Innovative Site Development.* Prepared for Chesapeake Research Consortium. Center for Watershed Protection, Ellicott City, MD.

Delaware Department of Natural Resources and Environmental Conservation (DE-DNREC). 1997. *Conservation Design for Stormwater Management.* Delaware DNREC, Dover, DE.

South Carolina Coastal Conservation League (SCCCL). 1995. *Getting a Rein on Runoff: How Sprawl and Traditional Towns Compare.* SCCCL Land Development Bulletin, No. 7. SCCCL, Charleston, SC.

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Chapter 7.10

URBAN RUNOFF POLLUTION

Sections:

7.10.010	Findings.
7.10.020	Purpose.
7.10.030	Definitions.
7.10.040	Good housekeeping requirements for reduction of urban runoff at existing properties.
7.10.050	Penalties for failure to comply with good housekeeping requirements.
7.10.060	Urban runoff reduction requirements for new development.
7.10.070	Urban runoff requirements for projects under construction.
7.10.080	Citywide urban runoff pollution education program.
7.10.090	Annual evaluation and revision of good housekeeping requirements, best management practices and construction requirements.

7.10.010 Findings.

The City Council finds and declares:

(a) The City of Santa Monica's storm and surface water drainage system is planned, designed and operated to handle storm water runoff flows from public and private properties. In order to function effectively, this system requires all private connections to it to be properly constructed, maintained and operated.

(b) Storm water runoff flows from individual properties onto the streets, then through storm drains to the beaches. It is therefore in the public interest to ensure that both public and private drainage systems are properly maintained, in order to facilitate the proper functioning of the City's storm and surface water drainage system, and to prevent pollutants from entering Santa Monica Bay.

(c) The City of Santa Monica is a co-permittee under the Los Angeles County National Pollutant Discharge Elimination System (NPDES) Municipal Permit and as such is obligated to implement Best Management Practice ("BMP") procedures to prevent and control the entry of pollutants and nonstorm water runoff into the City storm drain system.

(d) The most significant pollutants in urban runoff come from particulates and oil and grease.

(e) In order to better control the quantity and quality of urban runoff pollution, an active program requiring existing properties to adopt "good housekeeping" practices is essential.

(f) In order to reduce runoff contamination and runoff volume from private and publicly owned properties which will be newly developed, substantially rehabilitated or redeveloped in the future, a program ensuring that new developments incorporate design elements which facilitate such control is required.

(g) It is in the best interest of the City to establish guidelines and procedures for control of the quality of storm drainage runoff from construction sites within the City. (Prior code § 7280; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.020 Purpose.

The purpose of this Chapter is to permanently modify the structural causes of urban runoff pollution. The objectives of this Chapter include the reduction of both runoff volume and runoff contamination from existing residential and nonresidential properties and from future developments. This Chapter has two main goals. First, it aims to ensure that project sites maximize on-site percolation of runoff and/or have the capacity to convey or store peak runoff from a storm and release it at a slow rate so as to minimize the peak discharge into storm drains. Second, this Chapter aims to ensure that rain water is directed or contained so as not to become polluted by passage through contaminating material. (Prior code § 7281; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.030 Definitions.

The following words and phrases shall have the following meanings when used in this Chapter:

(a) **Area Susceptible to Runoff.** Any nonpermeable surface directly exposed to precipitation or in the path of runoff caused by precipitation which leads directly to neighboring properties or to the street.

(b) **Best Management Practices ("BMP").** Practices principally applicable to construction sites, parking lots and new developments which reduce the toxicity contained in, and the volume of, water which runs into storm drains, treatment facilities and the Santa Monica Bay.

(c) **Good Housekeeping Requirements ("GHR").** Storm water pollution control practices applicable to existing properties which have been demonstrated to significantly reduce and control storm water urban runoff pollution which runs into storm drains, treatment facilities and the Santa Monica Bay.

(d) **New Development.** For purposes of this Chapter, new development shall be defined as an increase of fifty percent or greater in the size of a single-family home, addition of one or more dwelling units in a multifamily structure, or improvements to a nonresidential property which are valued at fifty percent or more of the value of the existing improvements on the site.

(e) **Projected Runoff.** A numerical projection based on the following formula:

Precipitation multiplied by parcel size multiplied by imperviousness factor

Precipitation shall be presumed in all cases to be one inch of rainfall falling within a twenty-four-hour period. Parcel size shall be the total square footage of the lot being developed. An imperviousness factor represents the amount of average storm water drainage from the average of all parcels zoned for a particular land use.

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This numerical projection shall be used as a starting point in measuring compliance with the twenty percent urban runoff reduction required by this Chapter.

Table 7.10.030 contains imperviousness factors for different land use types. This table is derived from a more extensive list of imperviousness factors utilized by the Los Angeles County Department of Public Works — Stormwater Management Division, for benefit assessment districts for flood control.

(f) **Reduced Runoff.** A numerical projection based on the following formula:

Projected runoff multiplied by .80

This projection represents the maximum amount of storm water drainage expected to occur at a particular site upon implementation of an approved Urban Runoff Mitigation Plan.

(g) **Urban Runoff or Urban Runoff Pollution.** Water and suspended or dissolved materials deposited on surfaces and washed by storms or other sources of flowing water, through the flood control system to the ocean. Research studies have shown that urban runoff contributes many pollutants to receiving waters. Contamination includes bacteria and viruses, solid waste, and toxics such as heavy metals and petroleum-based compounds.

(h) **Urban Runoff Mitigation Plan.** A plan which shall be required to be approved in connection with any new development. Any such plan shall achieve twenty percent reduction of the projected runoff for the site. (Prior code § 7282; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.040 Good housekeeping requirements for reduction of urban runoff at existing properties.

The following good housekeeping requirements shall be adhered to by all persons within the City of Santa Monica.

(a) **Collection, Storage and Minimization of Runoff.**

(1) Water used for irrigation purposes shall not be allowed to run off of a site. In addition, washing down of paved areas shall be prohibited unless necessary for health or safety purposes and not in violation of any other provision of this Code.

(2) The uncovered outdoor storage of unsealed containers of building materials containing hazardous substances is prohibited in areas susceptible to runoff.

(b) **Maintenance of Equipment.**

(1) Objects such as vehicle motor parts containing grease, oil or other hazardous substances, and unsealed receptacles containing hazardous materials, shall not be stored in areas susceptible to runoff.

(2) Any machine which is to be repaired or maintained in an uncovered outdoor area shall be placed on a pad of absorbent material to contain leaks, spills or small discharges.

(3) Machinery and equipment, including motor vehicles, which are leaking significant amounts of oil or fluid must be repaired.

(c) **Removal of Debris and Residue.**

(1) All parking lots susceptible to runoff used for motor vehicle parking shall be swept, at minimum, on a monthly basis to remove debris. Lots with more than ten parking spaces and all public parking facilities shall be vacuum swept, at minimum, on a quarterly basis, to remove chemical residue. However, lots are not required to be vacuum swept for one month following a day when precipitation of one-half inch or more occurs.

(2) Fuel and chemical residue or other types of potentially harmful material, such as animal waste, garbage or batteries, which is located in an area susceptible to runoff, shall be removed immediately and disposed of properly. Household hazardous waste may be disposed of at the City's household hazardous waste collection facility or at any other appropriate disposal site and shall not be placed in a trash container.

(3) Intentional disposal of landscape debris into a storm drain is prohibited. Section 5.20.040 of the Santa Monica Municipal Code prohibits discharge of other types of pollutants into the storm drain.

(d) **Prohibition on Use of Pesticides and Fungicides Banned from Manufacture.** Use of any pesticide, herbicide or fungicide, the manufacture of which has been either voluntarily discontinued or prohibited by the Environmental Protection Agency, is prohibited. Those substances include any contained on the list below:

Banned Substances

Aldrin
BHC
Biothional
Captafol
Carbon Tetrachloride
Chloranil
Chlordane
Chlordimeform
Copper Arsenate (Basic)
Cyhexatin
DBCP
DDD (TDE)
DDT
Dieldrin
Dinoseb
EDBC's
Zineb, Wabam
Endrin
EPN
Fluoroacetamide
Heptachlor
Monocrotophos
OMPA
Phenarazine Chloride
PCB's
PCT's
Safrole
Silvex/ 2, 4, 5-T
Sodium Monofluoracetate
Strobane
2, 4, 5-TCP and its salts

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Table 7.10.030

Land Use	Area Breakdown	Imperviousness Factor
Residential		
Single	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Condominium, condominium conversion	Up to 0.3257 acre	0.8194
	Area in excess of 0.3257 acre	0.0190
Planned residential development	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Cooperative	Up to 0.3257 acre	0.8194
	Area in excess of 0.3257 acre	0.0190
Double, duplex or two-unit	Up to 0.6514 acre	0.4176
	Area in excess of 0.6514 acre	0.0190
Three-unit (any combination)	Up to 0.9771 acre	0.6815
	Area in excess of 0.9771 acre	0.0190
Four-unit (any combination)	Up to 1.3028 acre	0.8194
	Area in excess of 1.3028 acre	0.0190
Five or more units or apartments	All lot areas	0.8553
Modular homes	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Mobilehomes	Up to 0.3257 acre	0.4176
	Area in excess of 0.3257 acre	0.0190
Rooming houses	All lot areas	0.6815
Mobilehome parks	All lot areas	0.8194
Commercial		
Stores	All lot areas	0.9086
Store combinations	All lot areas	0.9086
Department stores	All lot areas	0.9850
Supermarkets	All lot areas	0.9762
Shopping centers (neighborhood)	All lot areas	0.9578
Shopping centers (regional)	All lot areas	0.9461
Office buildings	All lot areas	0.9086
Hotels and motels	All lot areas	0.9578
Professional buildings	All lot areas	0.9578
Restaurants and cocktail lounges	All lot areas	0.9461
Wholesale and mfg outlets	All lot areas	0.9086
Banks and savings & loans	All lot areas	0.9578
Service shops	All lot areas	0.9461

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Table 7.10.030 (Continued)

Land Use	Area Breakdown	Imperviousness Factor
Commercial (Continued)		
Service stations	All lot areas	0.9578
Auto, recreation & construction equipment sales and service	All lot areas	0.9461
Parking lots	All lot areas	0.9461
Animal kennels	All lot areas	0.9578
Nurseries or greenhouses	Up to 0.4136 acre	0.4733
	Area in excess of 0.4136 acre	0.0190
Industrial		
Light mfg	All lot areas	0.9086
Heavy mfg	All lot areas	0.9086
Warehousing distribution and storage	All lot areas	0.9086
Food processing plants	All lot areas	0.9578
Motion picture & radio/TV industries	All lot areas	0.8194
Lumber yards	All lot areas	0.9578
Mineral processing	All lot areas	0.4733
Parking lots	All lot areas	0.9086
Open storage	All lot areas	0.6551
Recreation and Entertainment		
Theaters	All lot areas	0.9086
Bowling alleys	All lot areas	0.9850
Clubs, lodge halls, fraternal organizations	All lot areas	0.9086
Athletic and amusement facilities	All lot areas	0.6551
Skating rinks	All lot areas	0.4733
Institutional		
Churches	All lot areas	0.8194
Schools	All lot areas	0.8194
Colleges and universities	All lot areas	0.4733
Hospitals	All lot areas	0.7435
Homes for aged and others	All lot areas	0.6815
Cemeteries	All lot areas	0.0000
Vacant	All lot areas	0.0190

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Thallium Sulfate
TOK
Toxaphene
TBT
Lead Arsenate
Calcium Arsenate
Pentachlorophenal
Creosote

(Prior code § 7283; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.050 Penalties for failure to comply with good housekeeping requirements.

(a) The Director of the Department of General Services, or his or her designee, is authorized to enforce Section 7.10.040 as follows:

(1) For the first failure to comply with any provision of Section 7.10.040, the Department of General Services shall issue to the affected person a written notice which includes the following information:

(i) A statement specifying the violation committed;

(ii) A specified time period within which the affected person must correct the failure or file a written notice disputing the notice of failure to comply;

(iii) A statement of the penalty for continued noncompliance.

(2) For each subsequent failure to comply with any provision of Section 7.10.040 following written notice pursuant to this Section, the Director of the Department of General Services may levy a penalty of one hundred dollars. Any statement informing a violator of a citation shall include a notice setting forth the hearing rights provided in subsection (a)(3) below.

(3) Any person assessed a penalty pursuant to subsection (a)(2) may dispute the penalty by requesting a hearing on a form provided by the City within the time and manner set forth in Section 6.16.030, provided that no hearing request shall be deemed timely filed and no hearing shall be held unless, within the time period to request a hearing, the person deposits with the City Treasurer money in the amount of any unpaid penalty due under this Section. If as a result of the hearing it is determined that the penalty was wrongly assessed, the City shall refund any money deposited to the person. The decision of the Hearing Examiner shall be final except for judicial review and shall not be appealable to the City Council.

(4) It shall not be a defense to the assessment of any penalty or to any other civil enforcement action provided for under this Section for a person to assert that any violation of Section 7.10.040 was caused by the actions of a person other than the person assessed except if the violation was caused by the criminal or negligent action of a person who was not an agent, servant, employee or family member of the person.

(5) Any penalty collected hereunder shall be deposited in the Urban Runoff Fund to be used as reimbursement for the Department of General Services' costs and expenses of administration and enforcement of this Chapter.

(b) The violation of this Chapter shall constitute an infraction punishable by a fine of one hundred dollars. Each day that a violation occurs shall constitute a separate offense.

(c) A violation of any provision of this Chapter is declared to be a public nuisance and the City Attorney is authorized to abate such violation(s) by means of a civil action.

(d) The penalties and remedies established by this Chapter shall be cumulative. (Prior code § 7284; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.060 Urban runoff reduction requirements for new development.

The following urban runoff reduction requirements shall apply to all persons submitting applications for new development within the City of Santa Monica.

(a) At the time of submittal of an application for the first planning approval for a new development project, an applicant shall be required to submit an Urban Runoff Mitigation Plan to the Department of General Services.

(b) In developing an Urban Runoff Mitigation Plan, a developer shall reduce projected runoff for a project by at least twenty percent through incorporation of design elements or principles which address each of the goals set forth below as subdivisions (1), (2) and (3) of this subsection. The design elements utilized by a developer may, but are not required to, include those provided on the list below, with the exception of subsection (b)(3)(i) which is required where applicable. Although design elements are set forth as if they address only one goal, in many cases they address more than one and can be used to address multiple goals in achieving the reduced runoff to be achieved by the mitigation plan:

(1) Increase permeable areas:

(i) Maximize the percentage of permeable surfaces and green space to allow more percolation of runoff into the ground. The use of porous materials for or near walkways will increase the amount of runoff seepage into the ground,

(ii) Use natural drainage, detention ponds or infiltration pits so that runoff may collect and seep into the ground and reduce or prevent off-site flows,

(iii) Divert and catch runoff through the use of swales, berms, green strip filters, gravel beds and french drains,

(iv) Construct driveways and walkways from porous materials to allow increased percolation of runoff into the ground;

(2) Minimize the amount of runoff directed to impermeable areas and/or maximize storm water storage for reuse:

(i) Install rain gutters and orient them towards permeable surfaces rather than driveways or nonpermeable surfaces so that runoff will penetrate into the ground instead of flowing off-site,

(ii) Modify grades of property to divert flow to permeable areas and to minimize the amount of storm water leaving the property,

(iii) Use sediment traps to intercept runoff from drainage areas and hold or slowly release the runoff, with sediments held in the trap for later removal,

(iv) Use retention structures or design rooftops to store runoff. Utilize subsurface areas for storm runoff either

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for reuse or to enable release of runoff at predetermined times or rates to minimize the peak discharge into storm drains. Cisterns are also a possible storage mechanism for reuse,

(v) Design curbs, berms or the like so as to avoid isolation of permeable or landscaped areas;

(3) Reduce parking lot pollution:

(i) All parking lots are required to have the capability to contain one inch of precipitation in a twenty-four-hour period. Options to meet this requirement include use of green strip filters and porous pavement to capture and percolate runoff where possible, and use of oil and water separators or clarifiers to remove petroleum-based contaminants and other pollutants which are likely to accumulate,

(ii) Direct runoff toward permeable areas and away from pollutant laden areas such as parking lots,

(iii) Construct parking lots from porous materials.

(c) The City's evaluation of each Urban Runoff Mitigation Plan will ascertain how well the proposed plan meets the combined objectives set forth in subsection (b) above. Each plan will be evaluated on its own merits according to the particular characteristics of the project and the site to be developed.

(d) The Director of the Department of General Services shall approve or disapprove the plan within fourteen calendar days of submittal. If the plan is disapproved, the reasons for disapproval shall be given in writing to the developer. Any plan disapproved by the Director of General Services or his or her designee must be revised by the developer and resubmitted for approval. A resubmitted plan will be approved or disapproved within fourteen calendar days of submittal. No building permit shall be issued until an Urban Runoff Mitigation Plan has been approved by the Department of General Services.

(e) Full or partial waivers of compliance with this Section may be obtained by persons who apply on forms supplied by the City and show that incorporation of design elements that address the objectives set forth in subsection (b) above is an economic and physical impossibility due to the particular configuration of the site or to irreconcilable conflicts with other City requirements. Requests for waivers shall be granted or denied, in writing, by a three-member board comprised of one representative each from the City's Planning Division, General Services Department, and City Manager's Office.

(f) Compliance with an approved Urban Runoff Mitigation Plan shall be a condition of any required planning approval. (Prior code § 7285; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.070 Urban runoff requirements for projects under construction.

The following Best Management Practices which address the problem of urban runoff shall apply to all projects undergoing construction in the City. The Best Management Practices list set forth below is required by the City. The requirements set forth below shall apply at the time of demolition of an existing structure or commencement of construction and until receipt of a certificate of occupancy:

(a) Runoff, sediment and construction waste from construction sites and parking areas shall not leave the site;

(b) Any sediments or other materials which are tracked off the site shall be removed the same day as they are tracked off the site. Where determined necessary by the Building Official or his or her designated representative, a temporary sediment barrier shall be installed;

(c) On an emergency basis only, plastic covering may be utilized to prevent erosion of an otherwise unprotected area, along with runoff devices to intercept and safely convey the runoff;

(d) Excavated soil shall be located on the site in a manner that eliminates the possibility of sediments running into the street or adjoining properties. Soil piles shall be covered until the soil is either used or removed;

(e) No washing of construction or other industrial vehicles shall be allowed adjacent to a construction site. No runoff from washing vehicles on a construction site is allowed to leave the site;

(f) Drainage controls shall be utilized as needed, depending on the extent of proposed grading and topography of the site, including but not limited to the following:

(1) Detention ponds, sediment ponds, or infiltration pits,

(2) Dikes, filter berms or ditches,

(3) Downdrains, chutes or flumes. (Prior code § 7286; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.080 Citywide urban runoff pollution education program.

The Department of General Services, along with other City Departments, shall conduct an informational program to educate the public about the dangers of urban runoff pollution and the means of controlling such pollution. The program shall educate residents and business persons who operate within the City about the contents of this Chapter prior to its effective date. (Prior code § 7287; added by Ord. No. 1642CCS, adopted 9/8/92)

7.10.090 Annual evaluation and revision of good housekeeping requirements, best management practices and construction requirements.

In recognition of the newness of regulation in the area of urban runoff pollution, the effectiveness of this Chapter shall be evaluated in writing by the General Services Department not later than one year from the effective date, and no less frequently than once every two years thereafter. The written evaluation should address the necessity for revisions of the process established by this Chapter for achieving urban runoff reduction and the necessity for revisions to good housekeeping requirements, best management practices and construction requirements, if any. (Prior code § 7288; added by Ord. No. 1642CCS, adopted 9/8/92)

Program Element Definition and Purpose

Design Guidelines for Land Development Projects

Program Element Objectives

The purpose of these guidelines is to provide countywide guidance for the use of the following best management practices (BMPs):

- Biofilters, including swales and filter strips
- Infiltration facilities, including retention basins, trenches, and porous pavement
- Detention basins, including wet and dry configurations
- Media filters
- Constructed wetlands

Fact sheets for each of the BMPs in this document provide:

- A description of the control measure including a definition and purpose for use of the BMP
- A list of appropriate applications
- A flowchart for use in incorporating the stormwater quality BMP into the overall site development process
- Limitations
- General design guidance
- Design criteria for specific configurations
- Maintenance and inspection requirements
- Example site plans demonstrating the use of the BMP

Appendices A through C provide reference data, equations and information. The attached list of references shows sources used for this set of guidelines.

Intended Audience

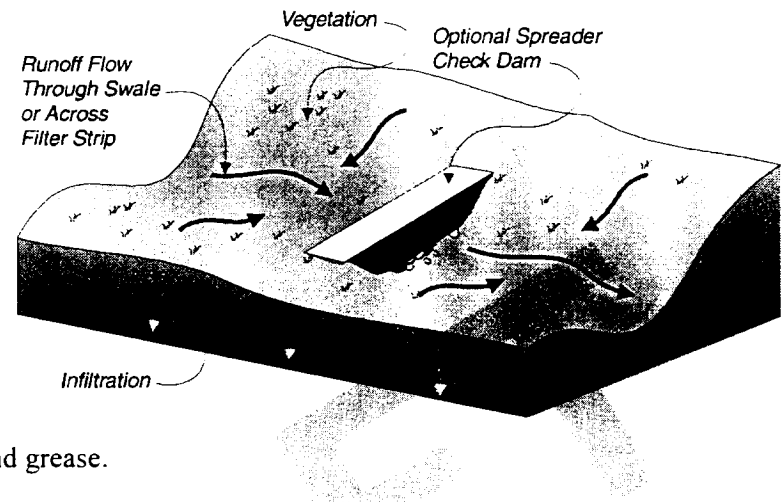
- Municipal planning, engineering and community development departments who will implement this program within each jurisdiction.

- Property owners, tenants, developers and engineers who will use these guidelines to design stormwater pollution controls for land developments.

BMP BF: Biofilter

Definition and Purpose

A biofilter passes stormwater slowly over a vegetated surface in the form of a *swale* or *filter strip* to filter pollutants and infiltrate the runoff.



Applications

Biofilters are appropriate for retarding/reducing runoff and removing sediment. Biofilters also achieve some removal of nutrients, heavy metals, toxic materials, floatable materials, oxygen demanding substances, and oil and grease.

Biofilters are most effective when designed to receive sheet flow from paved areas and maximize water contact with the biofilter vegetation and the soil surface. They are often placed within vegetated setbacks, landscaped common areas and other required open areas in residential, commercial, industrial and institutional land uses. Biofilters can have tributary areas of up to 5 acres, which makes them appropriate for lawn and parking areas.

Limitations

- Irrigation may be necessary to maintain vegetative cover.
- Sheet flow (for strip configuration) may be difficult to maintain.
- Channelization in swales may be difficult to avoid.
- Not appropriate for steep unstable slopes.
- Large area requirements may make this BMP infeasible for some sites.
- Slow infiltration rates in areas with soils in Hydrologic Soil Group C or D (See Appendix C) may cause runoff to pond.
- Not appropriate for pollutants toxic to vegetation.
- Tributary areas for this BMP are limited to 5 acres or less.

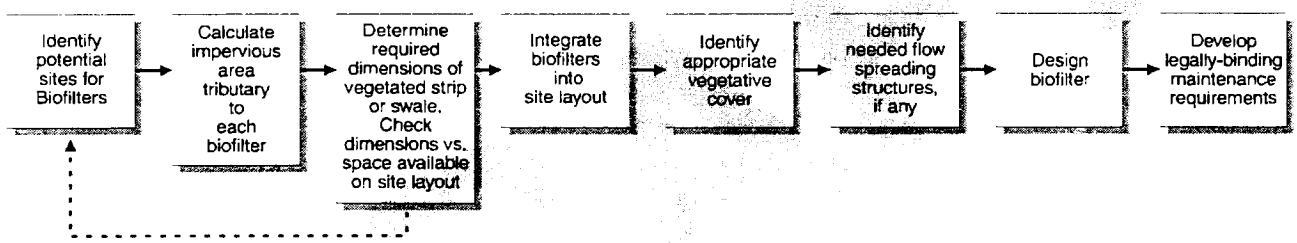
Design Guidance, General

Biofilters are an effective means for removing stormwater pollutants, infiltrating runoff, stabilizing soil and controlling erosion. Biofilters accomplish this in several ways. Vegetative covers shield soil surfaces from the impact of falling rain. Vegetation, such as turf grass or other ground cover, disperses flow and provides a rough surface to reduce flow velocity, which promotes infiltration and sediment deposition. Plants also remove nutrients in stormwater and transpire moisture from the soil. Healthy vegetation further helps to maintain a porous soil structure, aiding infiltration. These means for increasing runoff quality are achieved by

conveying shallow (less than 3 inches) flow across the vegetative cover. Pollutant removal effectiveness for biofilters is a function of area, flow depth, travel time and the quality of the vegetative cover.

Biofilters are relatively easy to design, install and maintain. Vegetated areas that would normally be included in the site layout, if designed for appropriate flow patterns, may be used as biofilters. Landscape architects can easily alter planting schemes to include appropriate turf or ground cover species for biofiltering purposes. Finally, maintaining a biofilter often requires little more than normal landscape maintenance activities such as irrigation and mowing. Compared with some other means for improving stormwater runoff quality, biofilters provide a relatively unobtrusive, attractive, long-term and inexpensive stormwater quality management technique.

There is some flexibility associated with biofilter configuration. Either filter strips or vegetated swales may be used, depending on the site layout, size of the impervious area, and the designer's vision of the landscape architecture. Filter strips, which are appropriate to place along and receive sheet flow from paved surfaces, are especially simple to incorporate. Vegetated swales, which can be designed to effectively treat concentrated flows from areas up to 5 acres, provide temporary runoff storage as well as filtering, require more area and are appropriate for larger sites. The flow chart below shows the general steps to follow when designing biofilter BMPs.



Location

The appropriate location for a biofilter on the site is determined by the locations of other site facilities, and the flow characteristics of the site. Biofilters are effective and simple when sited directly down gradient and adjacent to the impervious area from which they receive flow. Filter strips, for example, are easily sited adjacent to a driveway or other paved area. A swale may be used both as a traffic calming device/ parking area separator and as a means for adding landscape interest, in addition to using it as a stormwater quality management unit. Figures BF-1 and BF-2 show examples of

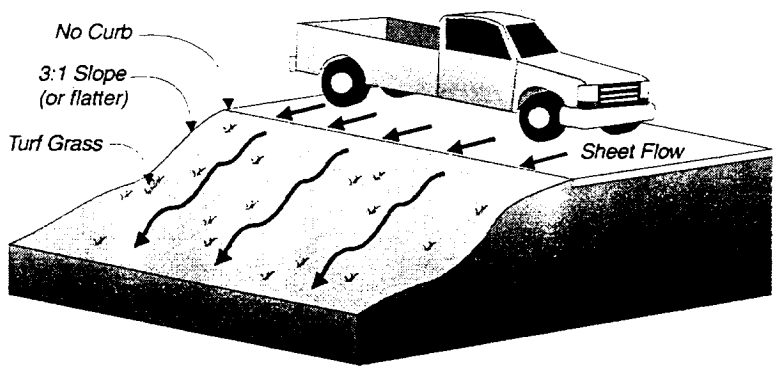


Figure BF – 1

Biofilter Strip Adjacent to Parking Area

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biofilter placement. If a biofilter is located such that it receives flow from both pervious and impervious areas, the entire flow will need to be intercepted. Where space is limited, biofilters shall be sited such that they receive flow only from

impervious areas to limit the size of the unit.

Size

Biofilters are sized according to the impervious area from which they receive flow. Figure BF-3 presents sizing criteria for large impervious areas for various areas of Ventura County. While a unit's drainage area may include both on- and off-site areas, accepting flow from off-site areas shall be avoided, if possible to minimize the size of unit. Several biofilters may be used on a single site, each sized according to the impervious area from which it receives flow. Flow shall be distributed across the biofilter as uniformly as possible, to avoid concentrating the flow. Strip configurations shall be sized appropriately for the dimensions of the contributing impervious area, and swales shall be sized based on a design storm flow, as described below under the guidelines for specific configurations.

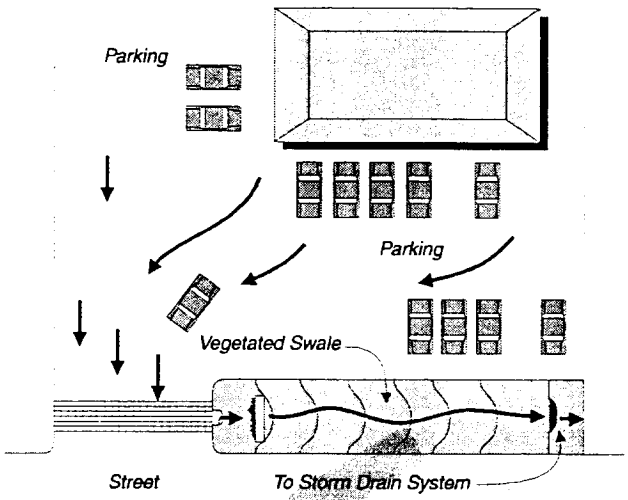

Figure BF – 2

Biofilter Placement

Dimensions

Both strip and swale configurations require a slow, shallow flow pattern and low-flow velocity. Recommended practice is to keep the flow depth below the height of the vegetation (up to about 3 inches deep) and the flow velocity under 1 ft/sec. Maximum flow depth, therefore, will vary slightly depending on the species of vegetative cover chosen, and upon desired maintenance practices.

Slope and Flow Path

- Slopes of filter strips and side slopes of swales shall be 3:1 or flatter.
- Slope of swales in the direction of flow shall be 0.5 to 2 percent. Slopes greater than 2 percent can be reduced with check dams. Slopes less than 1 percent require under drains.
- Peak velocity of flow through/across the unit shall be less than 1 ft/sec.

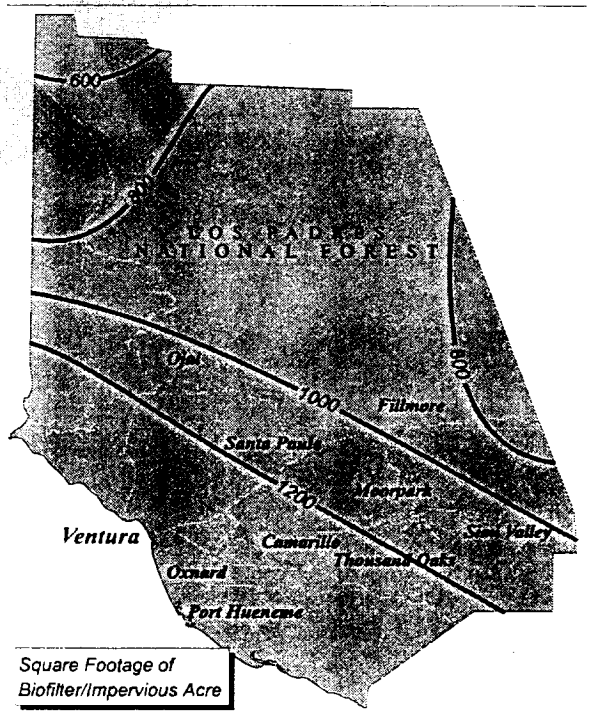

Figure BF – 3

Biofilter Sizing Criteria

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Vegetation

Vegetation serves primarily to maintain soil porosity and prevent erosion. The effectiveness and aesthetic appeal of biofilters is enhanced by selection of appropriate vegetative cover. Turf grass is preferred, and some other ground covers also may be appropriate.

An important maintenance consideration in the selection of appropriate vegetation is whether irrigation is planned for the site.

Table BF-1 at the end of this section provides a sample list of appropriate vegetative covers. Figure BF-4 is a map showing approximate zones of suitability for the listed species. These zones represent areas of climatological suitability according to the *Sunset Western Garden Book* and are referenced for each species in Table BF-1. Additional suggested vegetative species are listed in Table BF-2 at the end of this section. The map and tables are intended as guides in selecting vegetative covers. For specific species suitability and care information, refer to the sources listed for these tables. Contact the Natural Resources Conservation Service or the Ventura County Resource Conservation District for additional information.

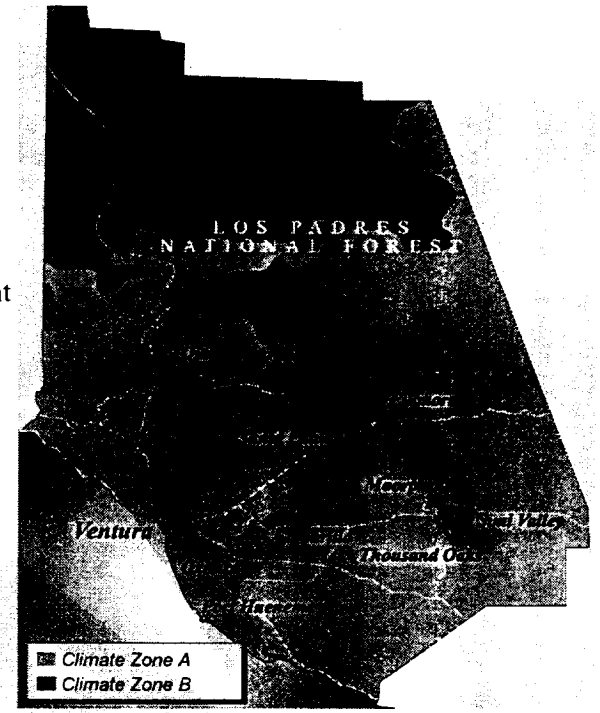

Figure BF – 4

Additional Criteria for Specific Configurations

Swale Design

Swales shall be designed to convey the Stormwater Quality Design Flow at a shallow flow depth (as appropriate for selected vegetation), typically with freeboard as required by the appropriate agency.

- Calculate the design runoff rate using the Rational formula as described in Appendix A.
- Use the Manning formula to obtain the required swale dimensions.
  - Set Manning's "n" to 0.20 for frequently mowed swales, or set "n" to 0.24 for infrequently mowed swales.
  - Use a 3:1 or flatter side slope and a longitudinal slope of 2 percent or less.
  - Design for a maximum v = 1 ft/s.
  - Make length of swale at least 100 feet. Minimum swale area shall be determined using Figure BF-3.

- Incorporate a bypass or overflow for storms larger than a 10-year design storm.

If a wide channel is required or desired, it may be necessary to include a flow-spreading device in the design to assure that the design flow depth and velocity are maintained. Flow spreading devices include dedicated structures such as multiple inlets, but also may be as simple as a rock bed and/or a low check dam, such as the one shown conceptually on Page BF-1. Use check dams, as necessary, to achieve a slope in the direction of flow of 2 percent or less. Other optional design considerations for swales are:

- Include a pretreatment area to catch sediment.
- Provide good access for mowing equipment.
- Use modular porous pavement (see BMP IN) to strengthen the bottom of the swale and prevent damage during mowing.

Strips

Four important design considerations govern the effectiveness of filter strips: only allow sheet flow to enter the strip; establish a dense vegetative cover; grade to a uniform, even and low slope; and install or maintain an appropriate area of filter. Below are additional notes regarding these considerations:

- Use Figure BF-3 to establish the minimum size of the biofilter for the impervious area.
- Establish strip configuration. For sidewalks, driveways and similar areas, filter strips shall be at least as wide (in the direction of flow) as the contributing impervious area. For other, larger impervious areas, use Figure BF-3 to calculate the total area of biofilter required and configure the strip such that flow takes 5 to 10 minutes to flow through the filter strip to achieve maximum filtering effectiveness. The slope and width shall be adjusted, as necessary, to achieve this while ensuring that flow velocities do not exceed 1 ft/sec.
- Achieve sheet flow. This may be fairly straightforward for small filter strips. For larger strips, or for strips where options for shaping the filter are limited, achieving sheet flow may be very difficult, and the use of a level spreader may help. Figure BF-5 shows a cross section of a filter strip that includes a level spreader. Construction of a level spreader may be coordinated with installation of the impervious surface, and is most practical for relatively flat areas such as parking lots. Use of a level spreader may be impractical for roads or driveways with steep slopes.

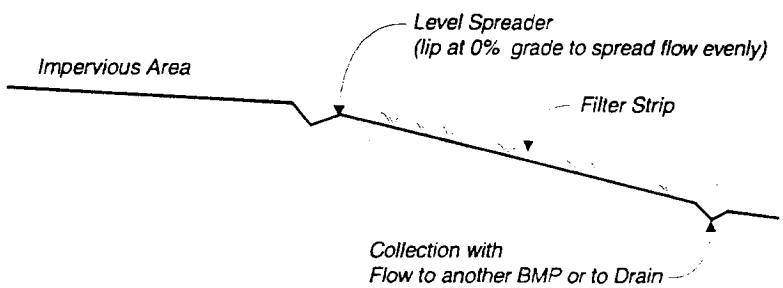

Figure BF – 5

Filter Strip with Level Spreader: Cross Section

(Level spreader usually requires concrete in order to precisely establish grade.)

- Establish and maintain a dense vegetative cover using irrigation and regular maintenance.

- Limit the slope for a filter strip to be no steeper than 3:1. If a steeper slope is necessary because of site constraints, the biofilter may not provide adequate stormwater quality improvement, and/or the slope may require additional stabilization methods.

Maintenance and Inspection Requirements

Biofilters require periodic maintenance, including the practices listed below.

- Check for erosion, a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed. Repair eroded areas and revegetate as needed.

- Inspect unit for evidence of channelization and adjust to spread flow.

- Inspect for siltation a minimum of twice a year, before and after the rainy season and after large storms. Remove deposits, as necessary.

- Maintain vegetation at or below the level of the pavement edge or level spreader to avoid flow concentration.

- Monitor health of vegetation and replace, as necessary.

- Mow, as appropriate, for vegetative cover species.

- Apply fertilizer during spring growth. Avoid fertilizer application during the rainy season.

- Repair vegetation in advance of the rainy season, allowing sufficient time for plant establishment.

- Control mosquitoes, as necessary.

- Prepare and submit a maintenance manual to the appropriate agency prior to facility installation.

- Report on maintenance to the appropriate agency.

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Table BF-1 Sample List of Appropriate Vegetative Covers			
Plant Name Common (Latin)	**Appropriate Species**	**Map Zones***	**Maintenance and Usage Notes****
Bermuda Grass (Cynodon)	"Santa Ana" hybrid	A	Moderate maintenance. Dormant (brown) in winter. Heat tolerant. Erosion control, swales.
Fescue (Festuca)	Red fescue (F. rubra)	A, B	Low to moderate maintenance. Tolerates some shade and poor soil. Lawns, swales, erosion control.
	"Kentucky 31" Tall Fescue (F. elatior)	A, B	Low maintenance. Tolerate shade and compacted soils. Rapid germination. Lawns, swales, erosion control. Useful as overseed for Bermuda grass during dormant (winter) season.
Ryegrass (Lolium)	Perennial (L. perenne)	A, B	Moderate maintenance. Heat intolerant. Fast sprouting. Useful as overseed for Bermuda grass during dormant (winter) season. Swales.
	Annual (L. multiflorum)	A, B	Annual (may live several seasons in mild climate). Moderate maintenance. Heat intolerant. Fast growing. Useful as overseed for winter-dormant species. Swales.

*See Figure BF-4

**Generally, these species will require supplemental irrigation.

Sources: ASCE, MWCG, Sunset

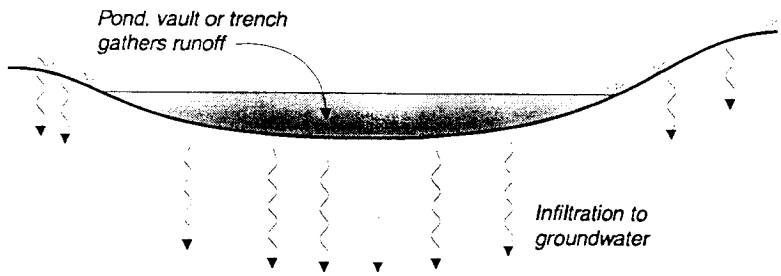
Table BF-2 Additional Suggested Vegetative Covers		
Plant Name Common (Latin)	**Appropriate Species**	**Usage Notes**
Orchard grass (Dactylis)	"Akaroa" or "Berber" (D. glomerata)	Irrigated Sites
Wheatgrass (Agropyron)	"Luna" or "Topar" pubescent (A. intermedium trichophorum)	Irrigated and Nonirrigated Sites
Zorro Fescue (Vulpia)	(V. myuros)	Nonirrigated Sites
Creeping wild Rye (Leymus)	(L. triticoides)	Nonirrigated Sites
Brome (Bromus)	Blando (B. mollis)	Nonirrigated Sites
	California or "Cucamonga" (B. carinatus)	Nonirrigated Sites

Source: NRCS-FOTG

BMP IN: Infiltration Facility

Definition and Purpose

An infiltration facility provides for the movement of stormwater into the soil in order to reduce runoff quantity and remove pollutants from the runoff through filtration in the soil matrix. Design configurations include basins, trenches, vaults, leach fields, and porous pavement.



Applications

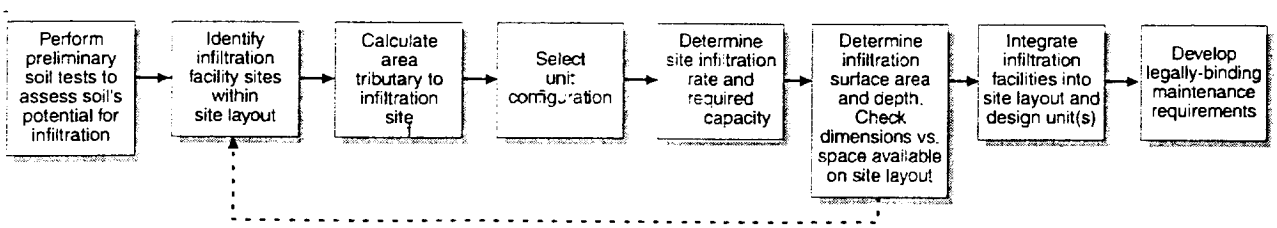
Infiltration facilities achieve some removal of sediment, heavy metals, toxic materials, floatable materials, oxygen demanding substances, oil and grease, bacteria, and viruses. Infiltration facilities also control runoff volume. Tributary areas to infiltration devices shall not exceed 50 acres. Land uses for which infiltration is appropriate include residential, commercial, and institutional land uses. These BMPs are most appropriate for sites with soil infiltration rates of 0.5 to 4 inches per hour, with low potential for long-term erosion in the contributing drainage area.

Limitations

- Loss of infiltrative capacity and high maintenance cost in fine soils.
- Low removal of dissolved pollutants in very coarse soils.
- Not suitable on fill sites or steep slopes.
- Risk of groundwater contamination in very coarse soils, may require groundwater monitoring.
- Not to be used with land uses where spills of hazardous chemicals could occur.
- Facilities cannot be put into operation until upstream drainage area is stabilized.

Design Guidance, General

Infiltration facilities work by percolating water downward through the soil to remove pollutants. They offer storage in addition to effective pollutant removal. The storage capacity of infiltration facilities reduces downstream runoff, which may serve to reduce downstream bank erosion in watercourses. The flowchart below provides general guidance for planning an infiltration facility as part of the site design.



An important consideration for all infiltration facility configurations is that, during construction, great care must be taken not to reduce the infiltrative capacity of the soil in the facility through compaction or by using the infiltration area as a sediment trap. Infiltration facilities shall be constructed late in the site development after soils (that might erode and clog the units) have been stabilized, or shall be protected until the site is stabilized.

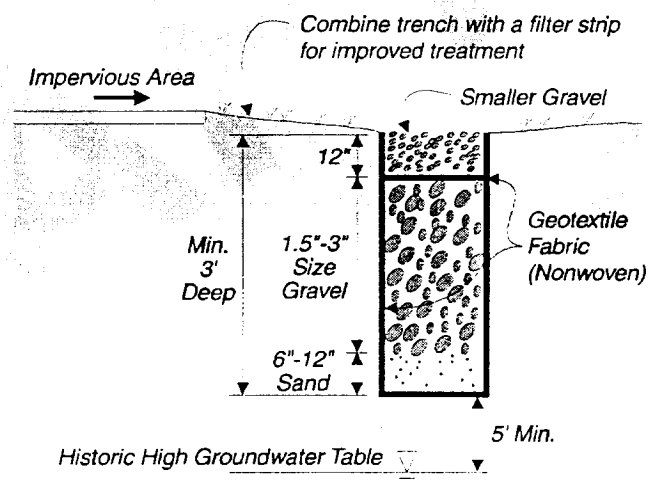
Infiltration facilities are sized to capture, store and infiltrate a volume of runoff, much in the same way that detention basins are sized to retain the volume of runoff produced by the design storm. Sizing guidelines are discussed in the following section, "Additional Criteria for Specific Configurations."

Infiltration Basin

An infiltration basin consists of a shallow, flat basin in pervious soil, with an inlet structure and an outlet structure to regulate emergency overflow. It functions by retaining runoff in the basin, where it then percolates into the soil. An infiltration basin requires significant space and is suitable for large drainage areas (10 to 50 acres). These basins, which are empty when not in use, could be dual-purpose. A grass-covered area in a park, for example, could function as an infiltration basin during the wet season, and serve as a park when dry.

Infiltration Trench or Vault

An infiltration trench consists of a long, narrow subgrade gravel bed, where runoff is stored until it is infiltrated. Figure IN-1 illustrates an infiltration trench. Flow enters the trench from the ground surface. Vegetated banks provide a biofilter to remove some sediment and improve basin performance. Infiltration trenches are relatively unobtrusive BMPs, as they have a small, narrow footprint and are flush with the ground. This BMP is well suited for small drainage areas, and integrates well into site layouts with placement near parking areas and in yards. Small infiltration trenches may be used to treat the runoff from building downspouts. Vaults are similar to infiltration trenches, but have a permanent engineered cover and may be placed under parking areas.



Adapted from NAHB, Colo DOT

Figure IN – 1

Infiltration Trench

Leach Field

A leach field is similar in concept to an infiltration trench in that it includes subgrade gravel beds for runoff storage and infiltration. Unlike trenches, however, flow enters the beds through a conduit, such as a perforated pipe. The gravel beds in a leach field are not exposed, as in a trench configuration. Rather, the entire facility is underground and may be covered. Figure IN-2 is a conceptual illustration of a leach field. A wide variety of conduits are available for use in leach fields. Equipment designed for septic systems may be applicable for stormwater use. Leach fields are well suited to unpaved areas such as lawns.

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Porous Pavement

Porous pavement consists of a surface covered with a porous material such as a specially-mixed concrete, asphalt or modular block, placed over a sand and gravel bed. Porous pavement allows runoff to seep through and down into the infiltration bed below. This BMP is particularly flexible, in that it may be used in many locations where standard pavement may be placed. Unlike standard pavement; however, porous pavement reduces runoff and improves runoff quality through filtration through soil.

The performance of porous pavement is enhanced by the addition of an adjacent biofilter strip, either upstream to remove sediments or downstream to further clean runoff. Porous pavement must be engineered for anticipated loads and shall not be placed where it will be subjected to heavy vehicle traffic, but is ideal for applications such as temporary/infrequent parking spaces. Figure IN-3 shows an example of porous pavement placement.

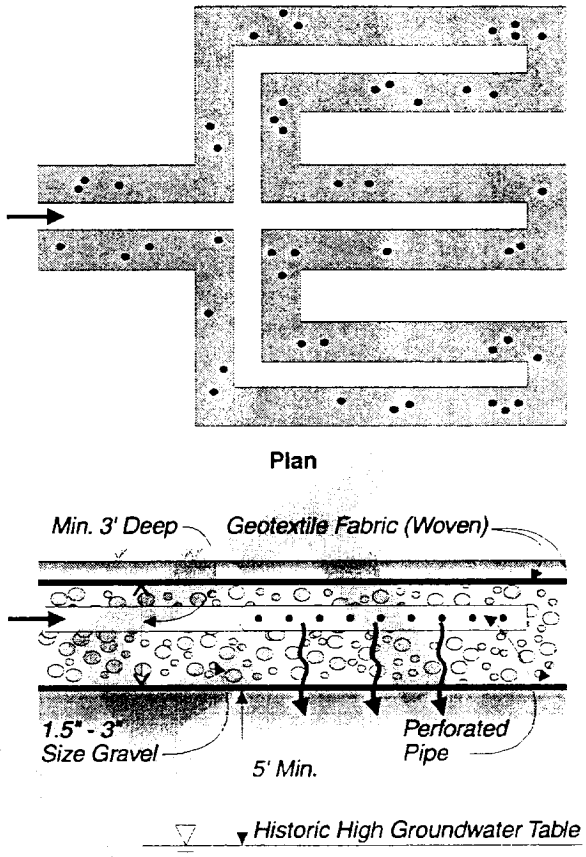


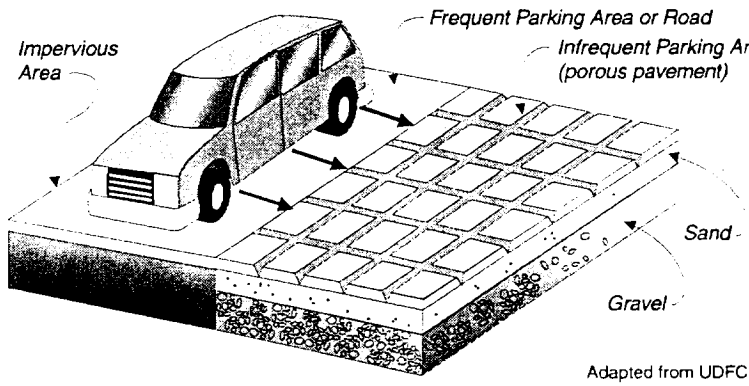
Figure IN – 2

Leach Field

Infiltration Rates

All of the infiltration facility configurations described above require adequate site infiltration rates. Before exploring the use of infiltration BMPs, preliminary soil investigations, including a percolation test, shall be performed to assess whether the soils on site have an extended infiltration rate of at least 0.5 inch per hour. Separate on-site infiltration systems from the groundwater table (or bedrock) by a minimum of 5 feet vertically to provide sufficient infiltration volume within the soil. Other suitability considerations include the soil makeup (Appendix C), site topography and the location of other facilities.

The site must further provide a relatively flat area in which to construct the facility. Infiltration BMPs may be constructed on slopes of up to 15 percent, provided that the base has less than a 3 percent slope. Infiltration facilities shall be sited at least 50 feet away from slopes steeper than 15 percent. Adequate spacing (100 feet or more) shall be provided between infiltration facilities and non-potable wells, tanks, drain fields and springs. For separation between infiltration BMPs and potable water supply wells, follow Department of Health Services



Adapted from UDFCD

Figure IN – 3

Porous Pavement in an Infrequent Parking Area

requirements in the Guidelines for Location of Water Wells. These BMPs shall also be sited at least 20 feet down slope or 100 feet up slope from building foundations. A soils expert shall be consulted when necessary to verify appropriate placement on site.

Additional Criteria for Specific Configurations

Infiltration Basin

Figure IN-4 shows a typical infiltration basin. The basins may be designed in a variety of shapes, but shall be sized for 75 annual percent capture. Appendix B provides the relationship of basin size to percent capture for various zones in Ventura County. The steps used in designing an infiltration basin are listed below.

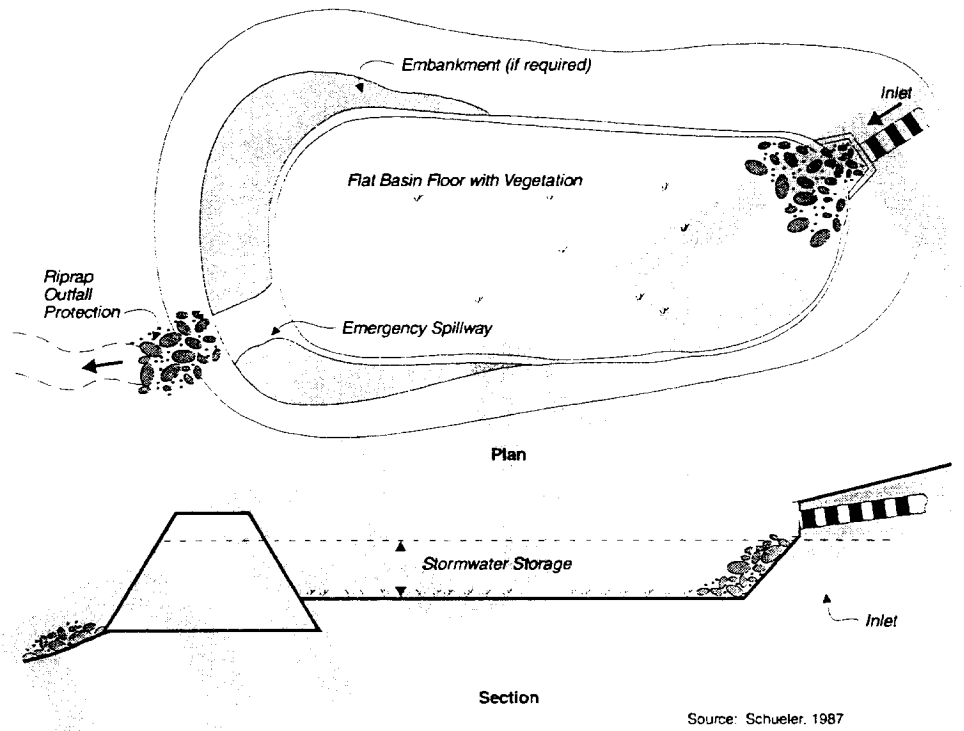


Figure IN – 4

Infiltration Basin

Size the Basin

- Using Figure B-1 (Appendix B), find the appropriate National Climatic Data Center (NCDC) station number for the site. Locate the appropriate percent capture curve in Appendix B by matching its NCDC station number.

- Calculate the percentage of the unit's drainage area that is impervious. This number, the directly connected impervious area (DCIA), determines which of the curves in Appendix B is applicable to the drainage area.

- Find the unit basin storage volume corresponding with the selected DCIA curve and a 75 annual percent capture rate. Interpolate between curves if necessary.

- Convert the required volume from Appendix B to cubic feet: Ac-ft x 43,560 = cubic feet.

- Calculate the minimum surface area of the infiltration system:

$$A_m = V/D_m$$

where:
A_m = minimum area required (ft^2)
V = volume of the infiltration basin (ft^3)
D_m = maximum allowable depth (ft) where:
$D_m = tI/12s$
and: I = site infiltration rate in (in/hr)
s = safety factor
t = minimum drawdown time = 40 hours

In the formula for maximum allowable depth, the safety factor accounts for the possibility of inaccuracy in the infiltration rate measurement. The less certain the infiltration rate the higher the safety factor shall be. Minimum safety factors shall be as follows:

- Without site-specific borings and percolation tests, use s=10
- With borings (but no percolation test), use s=6
- With percolation test (but no borings), use s=5
- With borings and percolation test, use s=3

Design the Basin Configuration

Lay out the basin shape and details according to site constraints and the additional design considerations listed below.

- Do not locate the facility on fill sites, or on or near steep slopes.
- Use energy dissipation at the inlet to minimize erosion scour.
- Vegetate slopes to minimize erosion (may require irrigation during most of the year).
- Vegetate bottom to reduce tendency to clog with fine materials (may require irrigation in summer).
- Design for operation with 1 foot of freeboard, minimum.
- Design side slopes of equal to or flatter than 3:1.
- Basins may be on-line or off-line with flood control facilities.
- Incorporate a bypass for off-line basins for storms larger than a 10-year design storm.
- For on-line basins, the water quality outlet may be superimposed on the flood control outlet or may be constructed as a separate outlet.
- Provide dedicated access to the basin bottom (maximum slope 10 percent) for maintenance vehicles.
- Provide security fencing, except when used as a recreation area.

See guidelines for biofilters (BMP BF) for information on selecting appropriate vegetative covers.

Design Infiltration Trench, Leach Field or Vault

Design trenches, leach fields and vaults to hold the water quality control volume.

- Using Figure B-1 (Appendix B), find the appropriate NCDC station number for the site. Locate the appropriate percent capture curve in Appendix B by matching its NCDC station number. Interpolate between curves if necessary.

- Calculate the percentage of the drainage area that is impervious. This number, the directly connected impervious area (DCIA) determines which of the curves on the chart is applicable to the drainage area.

- Find the unit basin storage volume corresponding with the selected DCIA curve and a 75 annual percent capture rate. Interpolate between curves if necessary.

- Convert the required volume from Appendix B to cubic feet: Ac-ft x 43,560 = cubic feet. Account for the volume occupied by the gravel in the bed (about 60%) by dividing the resulting volume by 0.40.

- Calculate the minimum surface area of the infiltration system:

$$A_m = V/D_m$$

where:
A_m = minimum area required (ft^2)
V = volume of the infiltration basin (ft^3)
D_m = maximum allowable depth (ft) where:
$D_m = tI/12s$ and shall be less than or equal to 8 feet.
and: I = site infiltration rate in (in/hr)
s = safety factor
t = minimum drawdown time = 40 hours

In the formula for maximum allowable depth, the safety factor accounts for the possibility of inaccuracy in the infiltration rate measurement. The less certain the infiltration rate is, the higher the safety factor shall be. Minimum safety factors shall be as follows:

- Without site-specific borings and percolation tests, use s = 10
- With borings (but no percolation test), use s = 6
- With percolation test (but no borings), use s = 5
- With borings and percolation test, use s = 3
- Adjust the length and width of the trench to suit site conditions and provide a reasonable construction configuration.

Additional design considerations for trenches, vaults and leach fields are listed below.

- Do not locate on fill sites, or on/near steep slopes.
- Include a 4- or 6-inch diameter observation well with locking cap, for monitoring (see observation well shown in Figure IN-5).
- Provide 6-inch to 12-inch sand layer on bottom.
- Include geotextile fabric around trench walls to prevent soils from migrating into the trench rock matrix.
- Include geotextile fabric 12 inches below ground surface with 3/4-inch rock on top, as a coarse filter.

- Use geotextile fabric with the minimum specifications listed in Table IN-1.

Table IN-1 Geotextile Properties			
Property	Test Reference	Minimum Specification	
		Woven (Slit Film)	Nonwoven
Grab Strength	ASTM D4632	200 lbs	90 lbs
Elongation at peak load	ASTM D4632	25 %	50 %
Puncture Strength	ASTM D3787	30 lbs	45 lbs
Permitivity	ASTM D4491	0.02/sec	0.7 sec^{-1}
Burst Strength	ASTM D3786	200 psi	180 psi
Toughness	% Elongation x Grab Strength	—	5,500 lbs
Ultraviolet Resistance (Percent strength retained at 500 Weatherometer hours)	ASTM D4355	70%	70%

Adapted from SSPWC, 1997.

- Use backfill and filter rock that consist of clean, washed aggregate 1.5 to 3 inches in diameter.
- Incorporate a bypass for large events.
- Provide dedicated access for maintenance.

Figure IN-1 (p. IN-2) shows a side view of an infiltration trench. Figure IN-5 below shows the use of an infiltration trench for the storage and exfiltration of water from a downspout.

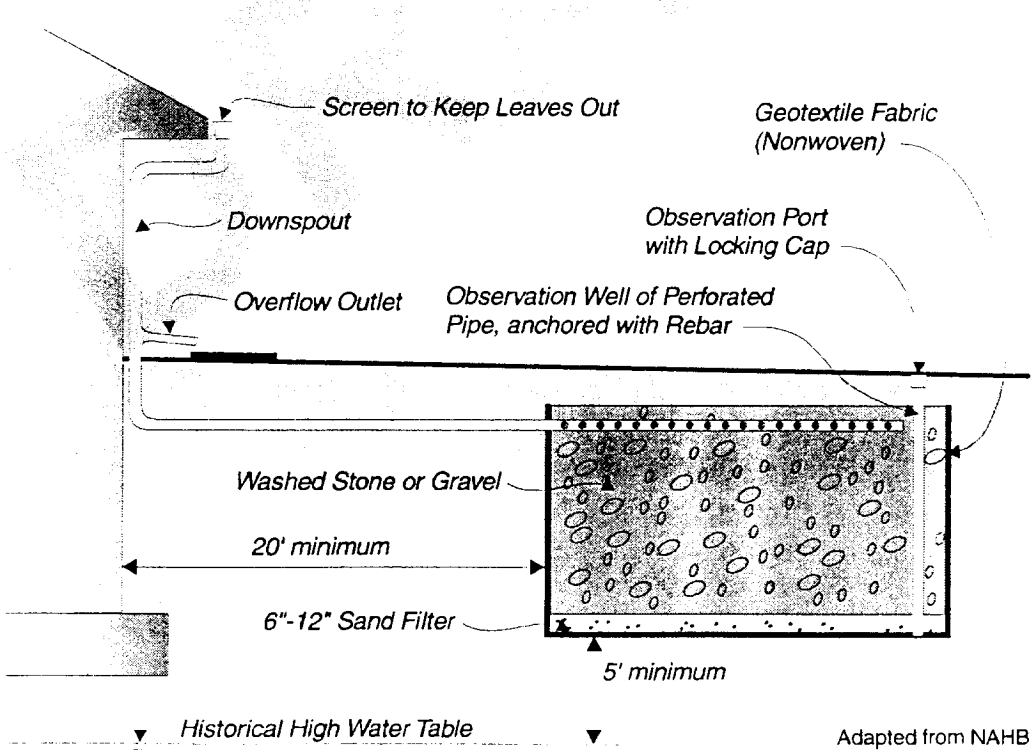


Figure IN – 5

Porous Pavement

Porous pavement configurations consist of pavement with void spaces filled with pervious material. Possible configurations include:

- Poured in-place slabs, which are reinforced slabs covering large areas; special forms create void space
- Precast concrete grids, which are delivered to the site in small paving units and assembled on site
- Modular unit pavers, which are monolithic, but form void spaces when pieced together on site
- Large aggregate asphalt pavement slabs designed for perviousness

Figure IN-6 shows a side view of a typical porous pavement installation. The pavement is installed over a gravel reservoir-type bed, sized in the same manner as an infiltration trench. When design conditions warrant, the size of the reservoir may account for the incomplete infiltration of runoff through the porous pavement. When using proprietary materials, consult manufacturer's recommendations or follow these guidelines, whichever is more conservative.

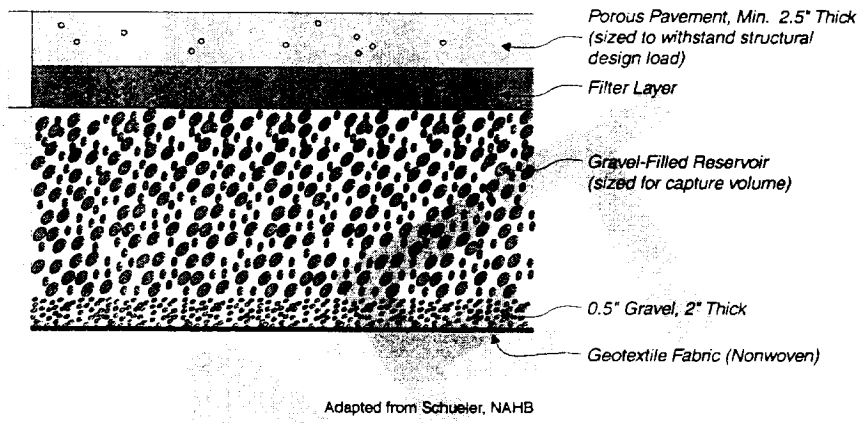


Figure IN – 6

Porous Pavement Installation

Maintenance and Inspection Requirements

Maintenance and inspection levels and frequencies depend on the amount of flow treated by the BMP. Most infiltration facilities require more maintenance initially and less as the site stabilizes. Wind blown dust, spills, tracking and other sources of pollutants can increase the need for and the frequency of maintenance. Use manufacturer's recommendations or the maintenance starting points listed below, whichever is more frequent, and adjust according to the facility's performance.

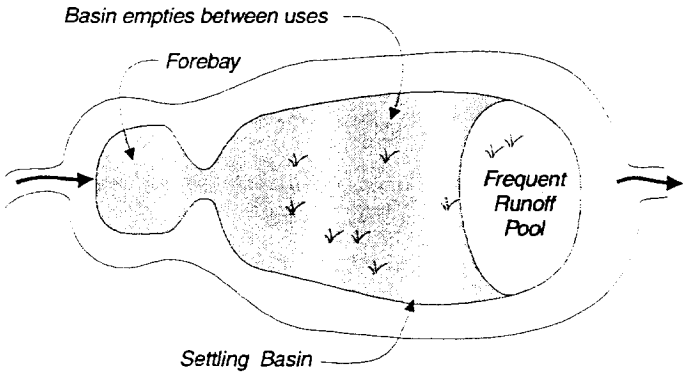
Infiltration BMPs require periodic maintenance and inspection, including the following practices:

- Inspect a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.
- Clean when loss of infiltrative capacity is observed.
    - If drawdown time is observed to have increased significantly over the design drawdown time, removal of sediment may be necessary. This is an expensive maintenance activity and the need for it can be minimized through prevention of upstream erosion.

- Porous pavement installations require continual maintenance to prevent clogging from sediments. Vacuum sweeping, followed by high-pressure jet hosing, is recommended 4 times annually. Inspections shall include a check for surface ponding, potholes and cracks.

- Monitor health of vegetation and replace as necessary.
- Mow, as appropriate for vegetative cover species.
- Control mosquitoes as necessary.
- Prepare and submit to the appropriate agency a maintenance manual prior to facility installation.
- Report on maintenance to the appropriate agency.

BMP DD: Dry Detention Basin



Definition and Purpose

A dry detention basin consists of a settling basin with an outlet sized to slowly release detained runoff over a 40-hour period. A "dry" detention basin is designed to be empty between usages.

Applications

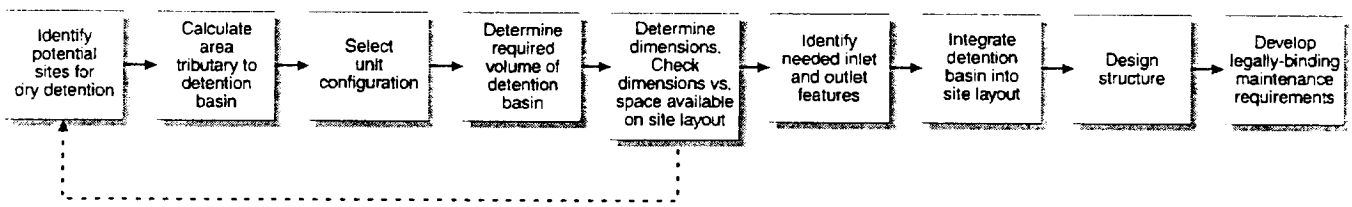
Dry detention basins are suitable for sites over 10 acres and are capable of removing particulate pollutants only. Land uses for which detention basins are appropriate include residential, commercial, and institutional uses and industrial uses, except for extractive, clay/glass/concrete works, food and printing. Most appropriate for sites with silt and expansive clay soils.

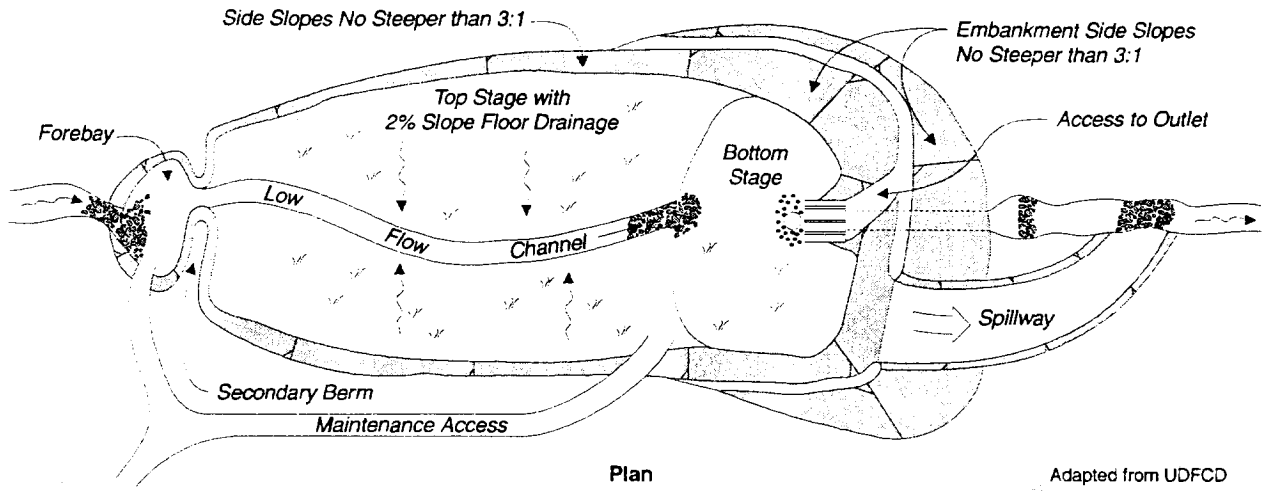
Limitations

- Not effective at removing liquid and dissolved pollutants.
- Small orifice diameter precludes use in small watersheds.
- Requires differential elevation between inlet and outlet.

Design Guidance, General

Dry detention basins improve stormwater runoff quality by detaining runoff and releasing it over an extended period (40 hours), allowing settling to occur. Basin layouts include a forebay, an outlet, a spillway and maintenance access roads (Figures DD-1 and DD-2). Dry detention basins are ideal in areas that do not have the consistent base flow available for the permanent pool used in wet detention basins, or in areas where supplemental water is too costly to be used. Dry basins are less likely to have mosquito problems and are less expensive to construct than wet basins. The following flow chart shows the general steps for designing this BMP.

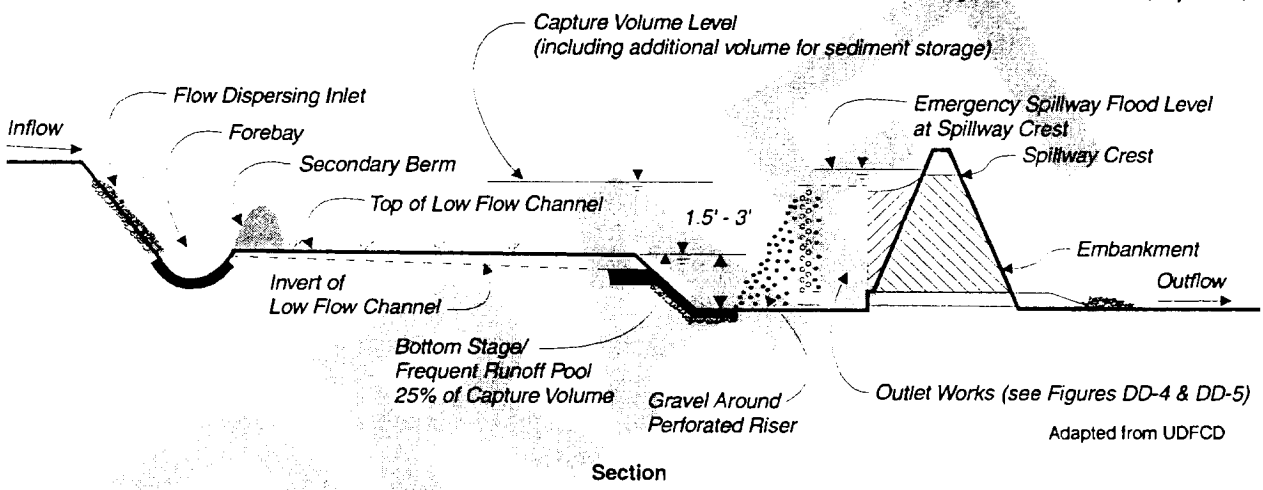




Adapted from UDFCD

Figure DD – 1

Dry Detention Basin (Top View)



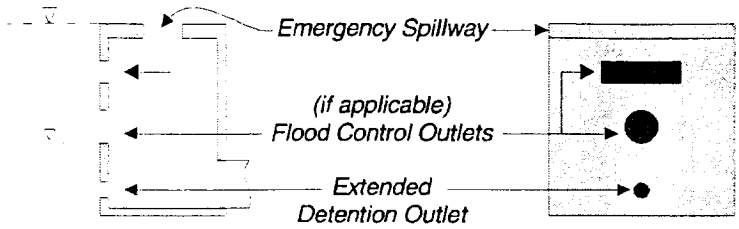
Adapted from UDFCD

Figure DD – 2

Dry Detention Basin (Side View)

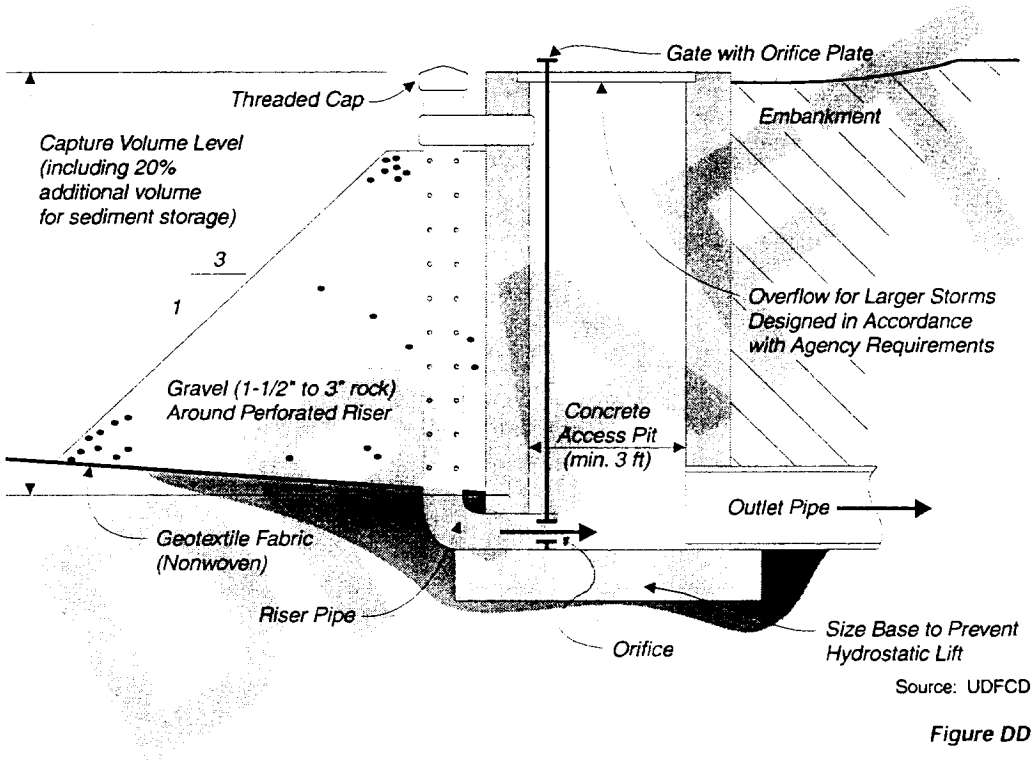
Dry detention basins shall be designed to have gently sloping sides (4:1 or flatter recommended, 3:1 maximum). Shallow basins are recommended over deep ones with the same volume. In two-stage design, the bottom stage (the frequent runoff pool) should store 25 percent of the basin volume and should be deeper than the top stage (Figure DD-2). Even with mild slopes and low flow rates, erosion may be a problem. The use of vegetation will help to reduce erosion. Floatables may be addressed by including trash racks in the design.

Outlet structures for dry detention basins shall be tailored for suitability with the basin size and shape. In large detention basins, install the outlet in a concrete block structure to prevent floatation of the outlet (Figure DD-3). Figure DD-4 shows an outlet detail. For small basins, the outlet can be constructed in a berm or manhole located downstream of facility (Figure DD-5).



Source: CA

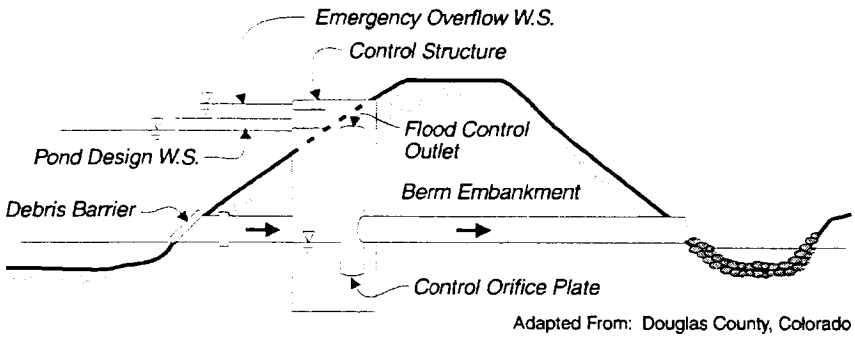
Figure DD – 3



Source: UDFCD

Figure DD – 4

Outlet with Perforated Riser Pipe



Adapted From: Douglas County, Colorado

Figure DD – 5

Control Manhole

Dry Basin Design

Size the Basin

- Using Figure B-1 (Appendix B), find the appropriate NCDC station number for the site. Locate the appropriate percent capture curve in Appendix B by matching its NCDC station number. Interpolate between curves if necessary.

- Calculate the percentage of the drainage area that is impervious. This number, the directly connected impervious area (DCIA) determines which of the curves on the figure is applicable to the drainage area.

- From the chart, find the unit basin storage size corresponding with the DCIA curve and a 75 annual percent capture rate.

- Calculate the required basin size for the tributary area by multiplying the unit basin storage volume by the tributary area.

- Design the basin according to site constraints, with dimensions as noted in Figures DD-1 and DD-2, taking into account the following considerations.

  - Include a forebay for initial course sediment settling. The forebay shall comprise 10 percent of the basin volume.

  - Design for a top stage maximum depth (D_{max}) in feet:

    $$D_{max} = 0.1 (A)^{0.5}$$

    where: A = basin length (ft) x width (ft)

  - Use a length to width ratio of at least 2:1, preferably 4:1 or more, with a minimum bottom width dimension of 30 feet. Ratio can be accomplished using baffles or multiple basins in series, if necessary.

- Provide access for maintenance equipment.

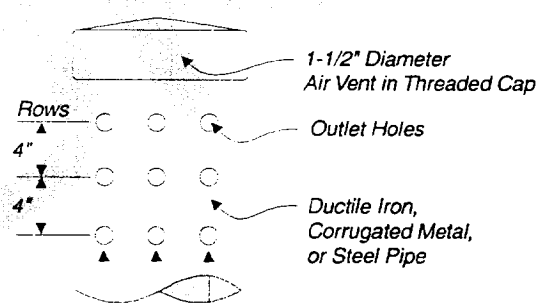
Size Outlet

It is important to size the basin outlet properly. Outlets that are too large result in partial filling of the basin and inadequate drawdown time. The outlet may be a single orifice, with or without a riser pipe. The outlet must be protected to avoid clogging from trash and debris. Use the following equation to size the outlet control orifice.

$$a = \frac{2A(H - H_0)^{0.5}}{3600cT(2g)^{0.5}}$$

where: a = area of orifice (ft^2)
A = average surface area of the full pond (ft^2)
c = orifice coefficient (use c=0.60)
T = drawdown time of full pond (use 40 hours)
g = gravity (32.2 ft/sec^2)
H = elevation when the basin is full (ft)
H_o = final elevation when basin is empty (ft).

A perforated riser pipe may be used (Figure DD-6). Use a sufficient number of columns and rows of outlet holes such that the sum of outlet hole areas equals "a" as defined above. Alternatively, install an orifice plate slide gate (DD-4), with the orifice size equal to "a". Then, install additional rows of holes in perforated riser to ensure that slide gate orifice size outflow of basin. Area of orifice (a) may need to be adjusted to account for installation specific hydraulic characteristics. Make adjustments to provide 40-hour drawdown.



Notes: 1. Minimum number of holes = 8
2. Minimum hole diameter = 1/4"

Source: UDFCD

Figure DD – 6

Riser Pipe for Extended Detention Basin

Other Design Considerations

The following additional design considerations apply to dry detention basins:

- Basins may be on-line or off-line with flood control facilities.
- For off-line basins, incorporate a bypass for storms larger than a 10-year design storm.
- For on-line basins, the water quality outlet may be superimposed on the flood control outlet or may be constructed as a separate outlet.
- Place inlets, outlets, baffles and berms to minimize short circuiting.
- Protect inlet and outlet from erosion by incorporating an energy dissipator.
- Include a gravel pack or trash rack at the outlet to prevent clogging.
- Design embankments for stability to meet State of California Division of Safety of Dams requirements if structure falls within that agency's jurisdiction.
- Use geotextile fabric with the minimum specifications listed in Table DD-1.

Table DD-1
Geotextile Properties (Nonwoven)

Property	*Test Reference*	*Minimum Specification*
Grab Strength	ASTM D4632	90 lbs
Elongation at peak load	ASTM D4632	50 %
Puncture Strength	ASTM D3787	45 lbs
Permitivity	ASTM D4491	0.7 sec^{-1}
Burst Strength	ASTM D3786	180 psi
Toughness	% Elongation x Grab Strength	5,500 lbs
Ultraviolet Resistance (Percent strength retained at 500 Weatherometer hours)	ASTM D4355	70%

Adapted from SSPWC, 1997.

Maintenance and Inspection Requirements

Dry detention basins require periodic maintenance and inspection including the following practices:

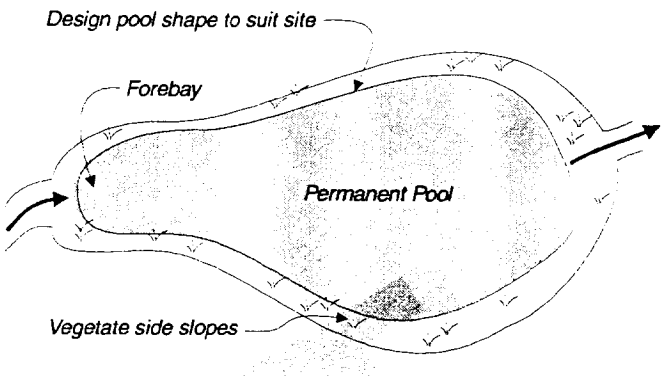
- Inspect outlet periodically for clogging a minimum of twice a year, before and after the rainy season, after large storms, and more frequently if needed.
- Check banks and bottom surface for erosion and fix problems.
- Inspect the basin a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.

- Remove sediment when accumulation reaches 25% of original design depth, or if resuspension is observed. Clean in early spring so vegetation damaged during cleaning has time to re-establish.
- Clean forebay frequently to lesser frequency of main basin cleaning.
- Control mosquitoes, as necessary.
- Prepare a maintenance manual and submit it to the appropriate agency prior to facility installation.
- Report on maintenance to the appropriate agency.

BMP WD: Wet Detention Basin

Definition and Purpose

A wet detention basin is a small artificial impoundment with emergent wetland vegetation around the perimeter designed for the removal of particulate matter and dissolved nutrients.



Applications

A wet detention basin BMP is suitable for sites where removal of particulate contaminants is desired. Wet detention basins also remove floatables and achieve some degree of dissolved contaminant removal. Land uses for which detention basins are appropriate include residential, commercial, and institutional uses and industrial uses, except for clay/glass/concrete works, food and printing. This BMP is most appropriate for sites with silt and expansive clay soils.

Limitations

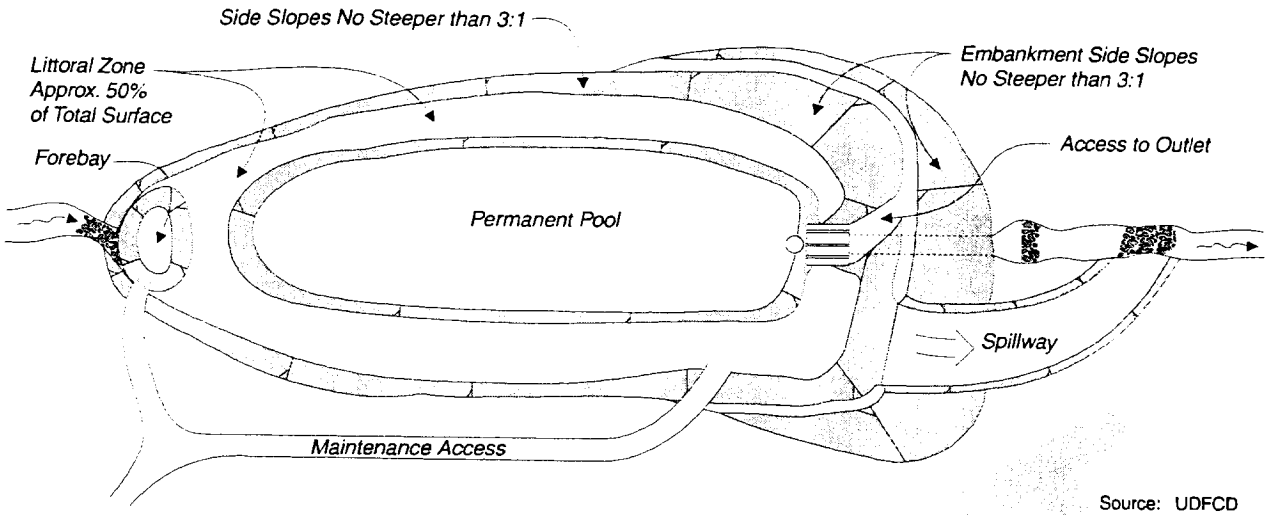
- This BMP may not be not suitable for areas with long dry spells and high evaporation rates without perennial groundwater base flow or supplemental water to maintain permanent pool and aquatic vegetation.
- Preventive measures will be required to control mosquito infestation.
- Measures may be required to maintain sufficient oxygen supply.
- This BMP may not be placed on steep, unstable slopes.
- A wet detention basin is infeasible in dense urban areas.

Design Guidance, General

A wet detention basin improves stormwater runoff quality by storing the runoff for an extended period, allowing settling to occur. Wet detention basin layouts include a forebay, an outlet, a spillway and maintenance roads. Wet basins are somewhat more effective at removing particulates than dry basins and may also remove some dissolved contaminants.

Features of a detention pond are shown in Figures WD-1 and WD-2. The permanent pool provides a vessel for the settling of solids between storms and the removal of nutrients and dissolved pollutants. The wetland vegetation bench, called the littoral zone, provides aquatic habitat, enhances pollutant removal, and reduces the formation of algae mats. Figure WD-2 also shows an optional surcharge detention storage volume overlying

the permanent pool. This can be used for flood control. This surcharge storage may be designed as extended detention for added pollutant removal efficiency.

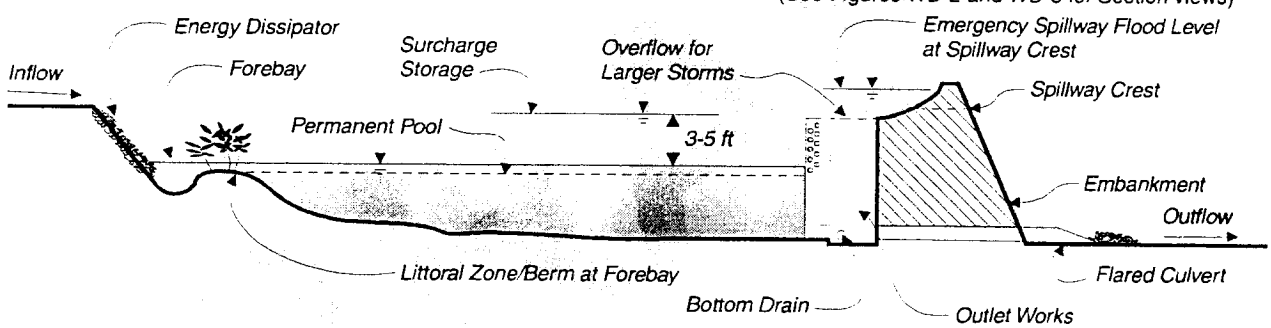


Source: UDFCD

Figure WD - 1

Wet Detention Basin (Plan View)

(See Figures WD-2 and WD-3 for Section views)

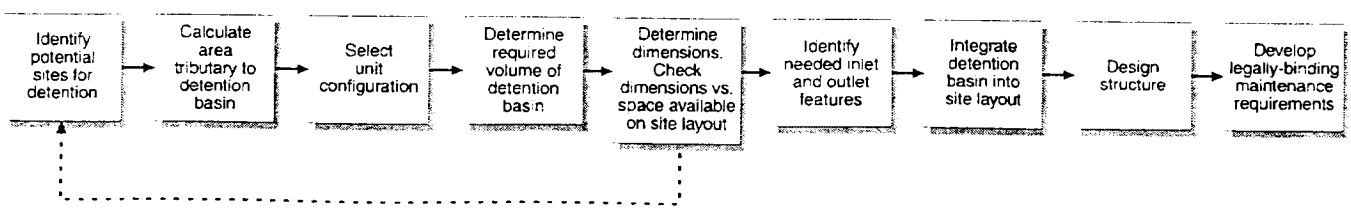


Source: UDFCD

Figure WD - 2

Wet Detention Basin (Section View)

Wet detention basins require more land than dry basins. Due to their large size, they are not feasible in dense urban areas where space may be limited. To maintain a permanent pool, perennial groundwater base flow must be available or flow must be provided artificially. The following flow chart shows the general steps for using this BMP.



The littoral zone of the wet detention basins shall be designed to have gently sloping sides (not steeper than 10:1) that cover approximately one-half of the basin surface area. The side slopes may be steeper in the open water portion of the basin. Depth of the permanent pool shall not exceed 10 feet, to prevent stratification.

Wet Basin Design

Design the basin to include a permanent wet pool, with a mean depth of 3 to 5 feet (Figures WD-1, WD-2, and WD-3). Figure WD-4 shows outlet works for a wet detention basin. The basin permanent pool design shall be sized using the method described below.

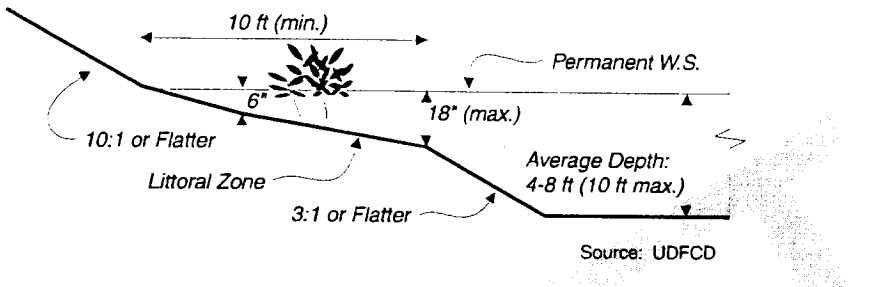
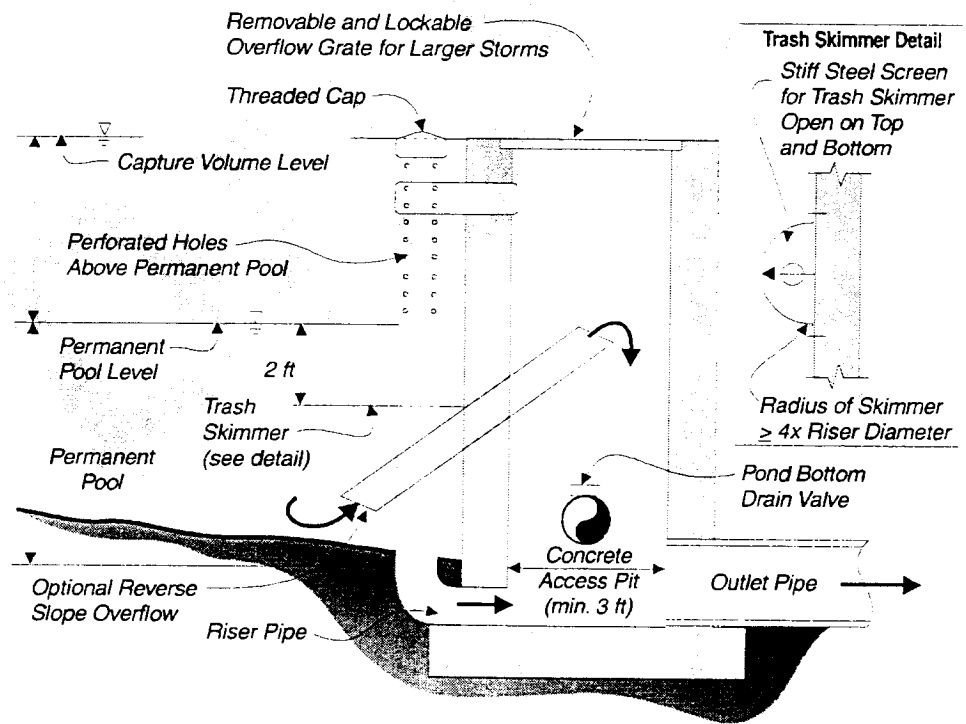


Figure WD - 3

Wet Extended Detention Basin (Section View)



Notes: 1. Alternate designs are acceptable as long as the hydraulics provides the required emptying times.
2. Use trash skimmer screens of stiff green steel material to protect perforated riser. Must extend from the top of the riser to 2 ft below the permanent pool level.

Source: UDFCD

Figure WD - 4

Outlet Works for Wet Detention Basin

Size the Basin

- Using Figure B-1 (Appendix B), find the appropriate NCDC station number for the site. Locate the appropriate percent capture curve in Appendix B by matching its NCDC station number. Interpolate between curves if necessary.

- Calculate the percentage of the drainage area that is impervious. This number, the directly connected impervious area (DCIA) determines which of the curves on the figure is applicable to the drainage area.

- From the chart, find the unit basin storage size corresponding with the DCIA curve and a 75 annual percent capture rate.

- Calculate the basic basin volume for the tributary area by multiplying the unit basin storage volume by the tributary area.

- Design the basin according to site constraints, with dimensions as noted in Figures WD-1, WD-2, WD-3 and WD-4, taking into account the following considerations.

  - The permanent pool volume shall be at least 0.75 times the basic volume.

  - The surcharge storage pool shall be at least 0.75 times the basic volume.

  - Include a forebay for initial course sediment settling. The forebay shall comprise 10 percent of the basin volume.

  - Include a littoral zone in the permanent pool. The littoral zone shall be 50% of the total permanent pool surface area. Select vegetation for littoral zone in accordance with guidance in BMP CW: Constructed Wetland.

  - Design for a surcharge storage pool maximum depth (D_{max}) in feet:

    $$D_{max} = 0.1 (A)^{0.5}$$

    where: A = basin length (ft) x width (ft)

  - Use a length to width ratio of at least 2:1, preferably 4:1 or more, with a minimum bottom width dimension of 30 feet. Ratio can be accomplished using baffles or multiple basins in series, if necessary.

  - Provide access for maintenance equipment.

Size Surcharge Storage Pool Outlet

It is important to size the surcharge storage pool outlet properly. Outlets that are too large result in partial filling of the basin and inadequate drawdown time. The outlet may be a single orifice, with or without a riser pipe. The outlet must be protected to avoid clogging from trash and debris. Use the following

equation to size the outlet control orifice.

$$a = \frac{2A(H - H_0)^{0.5}}{3600cT(2g)^{0.5}}$$

where: a = area of orifice (ft^2)
A = average surface area of the full pond (ft^2)
c = orifice coefficient (use c=0.60)
T = drawdown time of full pond (use 40 hours)
g = gravity (32.2 ft/sec^2)
H = elevation when the surcharge storage pool is full (ft)
H_o = final elevation when surcharge storage pool is empty (ft).

A perforated riser pipe may be used (see Figure DD-6 in BMP DD: Dry Detention). Use a sufficient number of columns and rows of outlet holes such that the sum of outlet hole areas equals "a" as defined above. Alternatively, install a reverse slope overflow (WD-4) with an orifice sized to equal "a". Area of orifice (a) may need to be adjusted to account for installation specific hydraulic characteristics. Make adjustments to provide 40-hour drawdown for the surcharge storage pool.

Additional Wet Detention Design Considerations

The following additional design considerations apply to wet detention basins:

- Basins may be on-line or off-line with flood control facilities.
- For off-line basins, incorporate a bypass for storms larger than a 10-year design storm.
- For on-line basins, the water quality outlet may be superimposed on the flood control outlet or may be constructed as a separate outlet.
- Place inlets, outlets, baffles and berms to minimize short circuiting.
- Protect inlet and outlet from erosion by incorporating an energy dissipator.
- Include a gravel pack or trash rack at the outlet to prevent clogging.
- Design embankments for stability to meet State of California Division of Safety of Dams requirements if structure falls within that agency's jurisdiction.

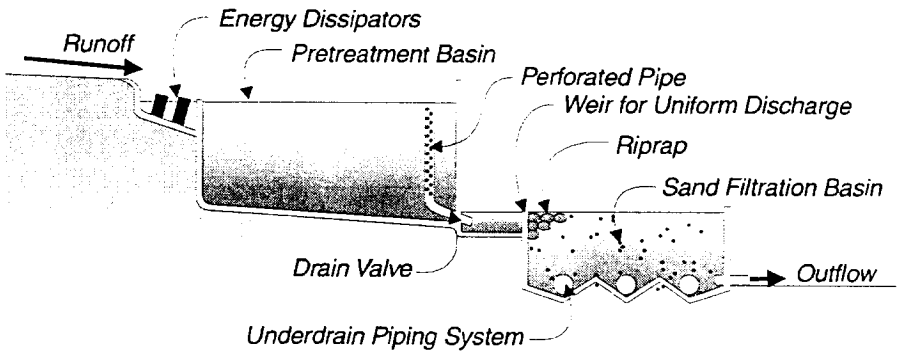
Maintenance and Inspection Requirements

Wet detention basins require periodic maintenance and inspection including the following procedures:

- Once vegetation is established, inspect basin at minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.

- Replace vegetation as necessary and remove plants.
- Remove floatables and remove sediment build-up when it accumulates to fill 25 percent of the original capacity.
- Clean forebay frequently to lessen frequency of main basin cleaning a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.
- Control mosquitoes, as necessary.
- Prepare a maintenance manual and submit it to the appropriate agency prior to facility installation.
- Report on maintenance to the appropriate agency.

BMP MF: Media Filter



Adapted from City of Austin
"City of Austin" Sand Filter

Definition and Purpose

A media filter is a two-stage constructed treatment system, including a pretreatment settling basin and a filter bed containing sand or other filter media. It is recommended for tributary areas up to 100 acres and is designed to remove sediment (particulate pollutants) only. The pretreatment sedimentation basin is included to avoid rapid clogging of the filter. Possible configurations include:

- Surface sand filter
- Underground sand filter
- Linear basin

Applications

Media filters remove particulate and floatable materials and are appropriate for drainage areas of up to 100 acres. The sand filter has a removal efficiency of 70 to 90 percent, which is similar to the removal efficiency for wet and dry detention basins. The sand filter is ideal for Southern California because it does not require vegetation and requires less space than other BMPs with similar removal efficiencies when a partial treatment sedimentation basin is used. The effectiveness of the sand filter was proven in the City of Austin, where they are widely used today.

Selection of a unit configuration for a media filter depends on the size of the drainage area and the facility location. Land uses for which media filters are appropriate include residential, commercial, and institutional uses, and industrial uses, except for extractive, chemical/petroleum, food and printing. A media filter is not appropriate for agricultural sites or other areas with expanses of erosive soil upstream of the unit.

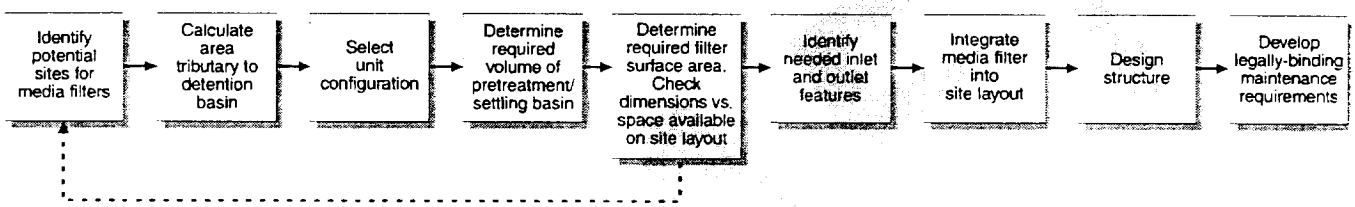
For large watersheds, i.e., 50 to 100 acres, a "City of Austin" sand filter is recommended (see figure above). For very small catchments, a linear basin (see Figure MF-5) is recommended because these smaller media filters provide for lower flows and fit in compact, underground places. Underground linear sand filters are especially suitable for industrial sites because they can be situated to accept sheet flow from adjacent pavement.

Limitations

- Heavy maintenance requirements.
- Not effective at removing liquid and dissolved pollutants.
- Significant headloss may limit use on flat sites.
- Severe clogging potential if erodible soil surfaces exist upstream.

Design Guidance, General

The objective of using a media filter is the removal of particulate pollutants, as with extended detention basins (BMP DD and BMP WD) and constructed wetlands (BMP CW). The filter medium used in this BMP is typically sand and sometimes a peat/sand mixture. Advantages of using media filters are that they require less space than other treatment practices and can be located underground. Media filters may be used when there is a lack of water and it is infeasible to use a wet detention basin, wetlands or biofilter. The following flow chart shows suggested steps for using media filters during planning for site development.



The following sections provide specific guidance for sizing the pretreatment/settling basin and the filter basin.

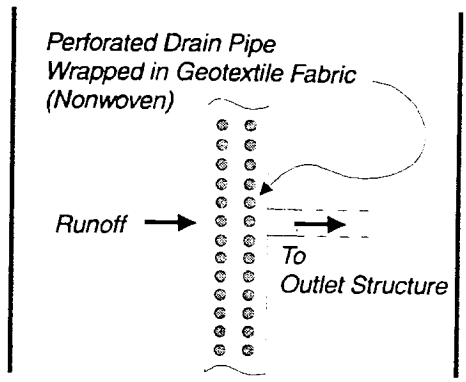
Pretreatment/Settling Basin Design

- Size the pretreatment/settling basin to hold the entire water quality volume equivalent to the 75 annual percent capture volume (Appendix B) and to release the volume to the filter over a 40-hour drawdown period. For a partial pretreatment sedimentation basin (recommended where site constraints exist), use no less than 20 percent of the volume calculated for the full sedimentation design. When a partial pretreatment sedimentation basin is used, filter maintenance requirements increase substantially and must be reflected in the maintenance manual.

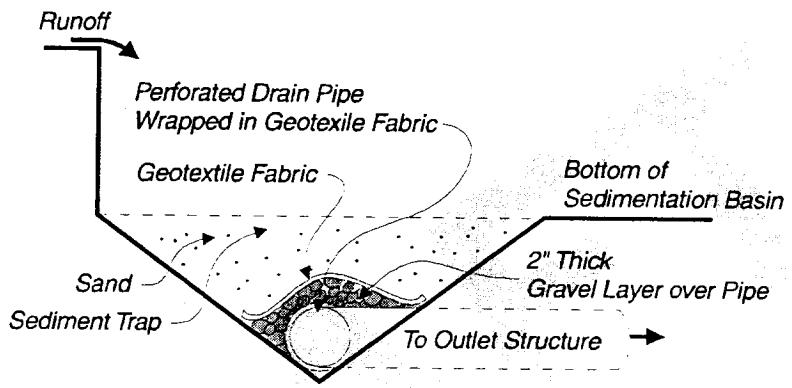
- Lay out the basin such that the length to width ratio is 4:1 (preferably, 2:1 is acceptable) and maintain 1 foot of freeboard.

- Locate energy dissipator upstream of the entrance (see figure on page MF-1).

- Design an outlet for the pretreatment basin. Include provisions to drain the basin, such as using a perforated pipe or a drain. Outlet configurations vary. The "City of Austin" sand filter design incorporates a perforated riser pipe (see BMP DD). The sediment trap design (Figure MF-1) includes an additional horizontal perforated outlet that conveys flow to the outlet structure. For linear basins, the water crests over a wall to enter the filter basin (Figure MF-5).



Plan



Section

Adapted from City of Austin

Figure MF-1

Filter Basin Design

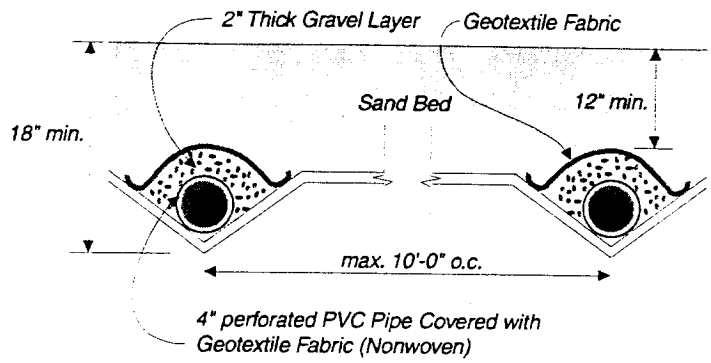
The filter basin surface area can be determined with the following equation for a maximum (full pretreatment basin) filtration time of 24 hours and an average hydraulic head on the filter of 3 feet:

Let Filter Area = A_F,

$$A_F = \frac{A_T\, S}{K\, T_D}$$

Where A_F = filter area (sq ft)
A_T = area draining to facility (sq ft)
S = unit basin storage volume from Appendix B (ac-ft/ac)
K = coefficient of permeability = 3.5 ft/d for full sedimentation and 2 ft/d for partial sedimentation (ft/d)
T_D = drawdown time of the maximized volume = 40 hours (1.67 days) for full pretreatment and 8 hours (0.33 days) for partial pretreatment (days)

This equation provides an appropriate surface area for filter media of diameter of 0.02- to 0.04-inch, as recommended by the City of Austin. The filter area must be larger if smaller media is used.The sand bed can be designed as shown in Figure MF-2. Geotextile fabric between the sand and the gravel and the gravel and



Adapted from City of Austin, 1989

Figure MF - 2

Sand Bed Underdrains

the pipe can help prevent maintenance difficulties. The clean sand size of 0.02- to 0.04-inch diameter is recommended. Install underdrains (Figure MF-2): use 4-inch diameter PVC pipe with 3/8-inch perforations around pipe with 6 inches of space between each perforation group, a maximum of 10 feet between laterals, and a minimum slope of 1/8 inch per foot. A flow spreader shall be included between the pretreatment and filtration basins.

Include a bypass around the filter for flows larger than a 2-year event (see Appendix A) and minimize the potential for erosion upstream of the filter. A final factor that shall be considered in filter design is the trade-off between media maintenance requirements and pollutant removal efficiency. Smaller-grained media provides better performance than coarser-grained media, but has higher maintenance requirements.

Geotextile fabrics must meet the minimum specifications listed in Table MF-1.

Table MF-1
Geotextile Properties (Nonwoven)

Property	*Test Reference*	*Minimum Specification*
Grab Strength	ASTM D4632	90 lbs
Elongation at peak load	ASTM D4632	50 %
Puncture Strength	ASTM D3787	45 lbs
Permitivity	ASTM D4491	0.7 sec^{-1}
Burst Strength	ASTM D3786	180 psi
Toughness	% Elongation x Grab Strength	5,500 lbs
Ultraviolet Resistance (Percent strength retained at 500 Weatherometer hours)	ASTM D4355	70%

Adapted from SSPWC, 1997.

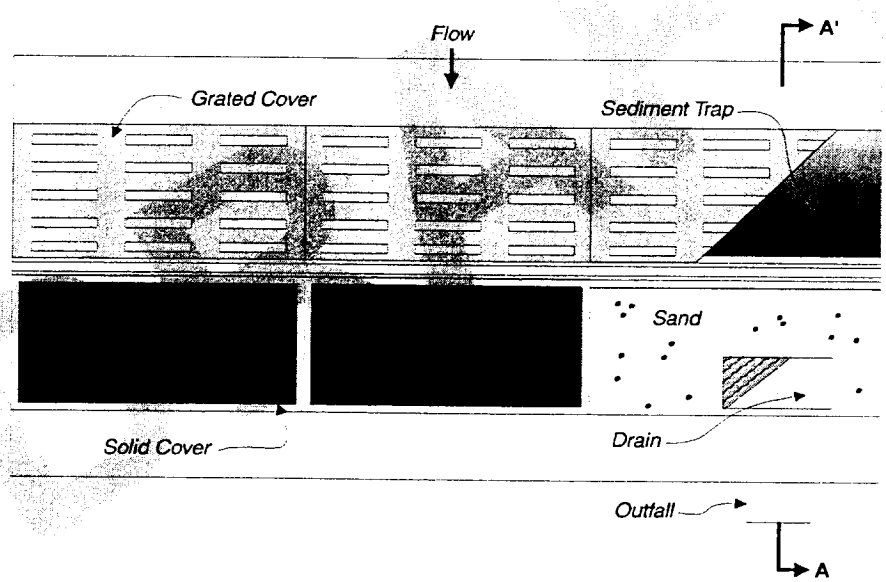
Additional Criteria for Specific Configurations

A linear basin configuration is recommended for smaller drainage areas, i.e., a few acres or less, because it provides adequate treatment for low flows and fits in compact spaces.

Linear Basin

The linear basin's settling basin and filter should be sized according to the general media filter design criteria. Example structures are shown in Figures MF-3 and MF-4. The structure must be able to withstand traffic loads if located in areas subject to traffic.

Minimum sand depth shall be 18 inches and maximum outlet pipe diameter shall be 6 inches (use multiple pipes if needed). The flow should enter the sedimentation chamber in an even distribution. Sedimentation chamber should be positioned carefully relative to the pavement to ensure sheet flow.



Source: Shaver, 1991

Figure MF - 3

Linear Basin (Plan)

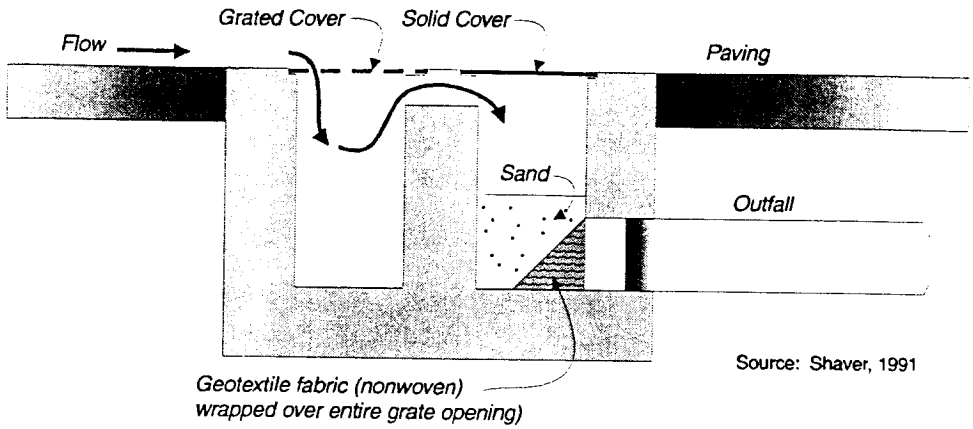


Figure MF - 4

Linear Basin (Section A'A)

Maintenance and Inspection Requirements

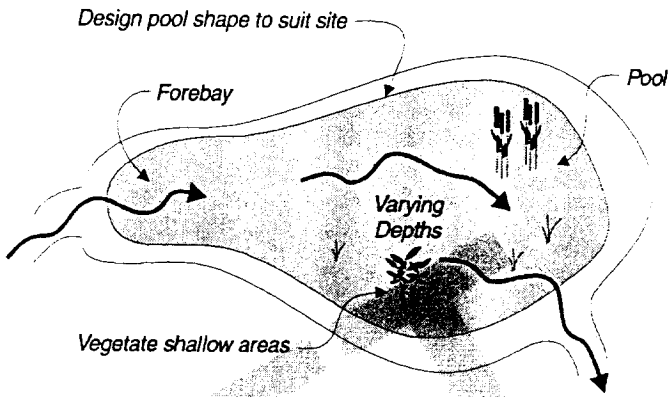
Media filters require periodic maintenance and inspection including the following practices:

- Inspect filter sand a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed. Media filters with partial pretreatment require quarterly filter cleaning, or more often if the drainage area is erosive.
- Clean filter surface and filter semiannually, or more often if the drainage area is erosive. Media filters with partial pretreatment require quarterly filter cleaning, or more often if the drainage area is erosive.
- Remove sediment when it accumulates to fill 25 percent of the original capacity of the pretreatment basin, or more frequently if needed.
- Remove floatables when they cover more than 25 percent of the surface area of the pretreatment basin, or more frequently if needed.
- Replace media, if necessary (if loss of permeability is noted), after construction activity has ceased and soils have stabilized.
- Clean pretreatment area to avoid plugging of the filter media a minimum of twice a year, before and after the rainy season, after large storms, or more frequently if needed.
- Control mosquitoes, as necessary.
- Prepare a maintenance manual and submit it to the appropriate agency prior to facility installation.
- Report on maintenance to the appropriate agency.

BMP CW: Constructed Wetland

Definition and Purpose

A constructed wetland is a single-stage treatment system consisting of a forebay and micro pool with aquatic plants. A constructed wetland removes high levels of particulates, as well as some dissolved contaminants. Therefore, it is likely to have a significant impact on sediment, nutrients, heavy metals, toxic materials, floatable materials, oxygen demanding substances and oil and grease.



Appropriate Applications

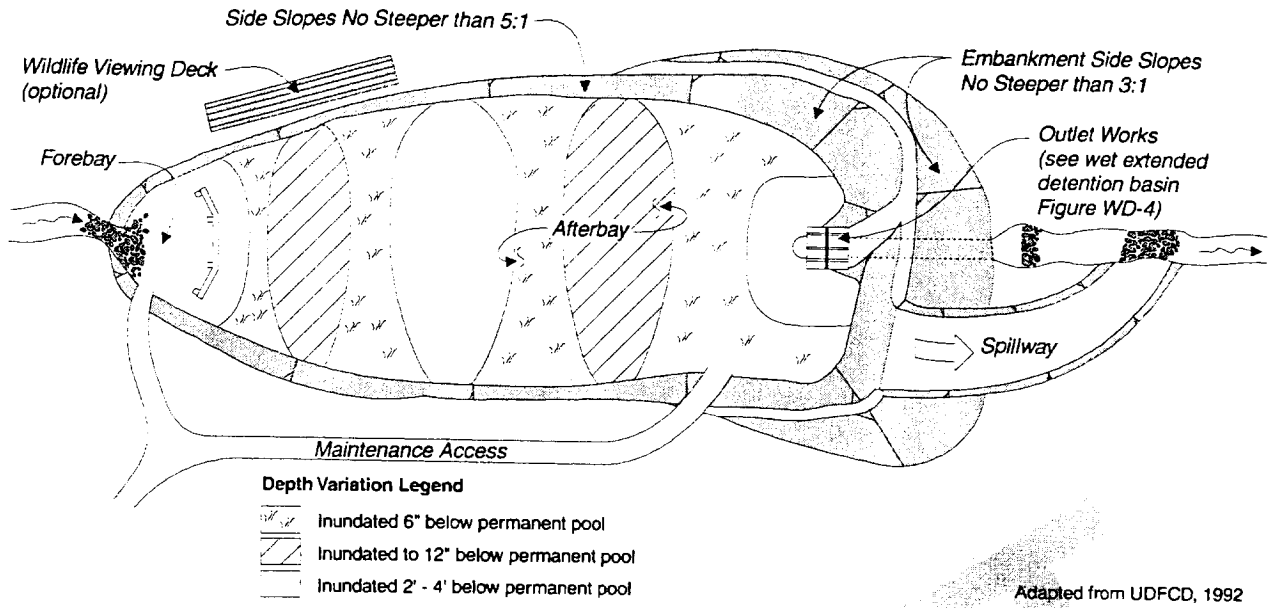
Constructed wetlands (Figures CW-1 and CW-2) are ideal for large, regional tributary areas where space is available to provide shallow water conditions. Constructed wetlands offer passive recreation, a wildlife site and an aesthetic alternative for stormwater management. Land uses for which this BMP is appropriate include large residential developments, and commercial, institutional and industrial areas where incorporation of a green space and a wetland into the landscape is desirable and feasible.

Limitations

- Need base flow or supplemental water to maintain water level.
- Not appropriate for steep unstable slopes or densely developed areas.
- May attract and breed mosquitoes.
- Potential for nutrient release in winter.
- Hydraulic capacity may be reduced with plant overgrowth.

Design Guidance, General

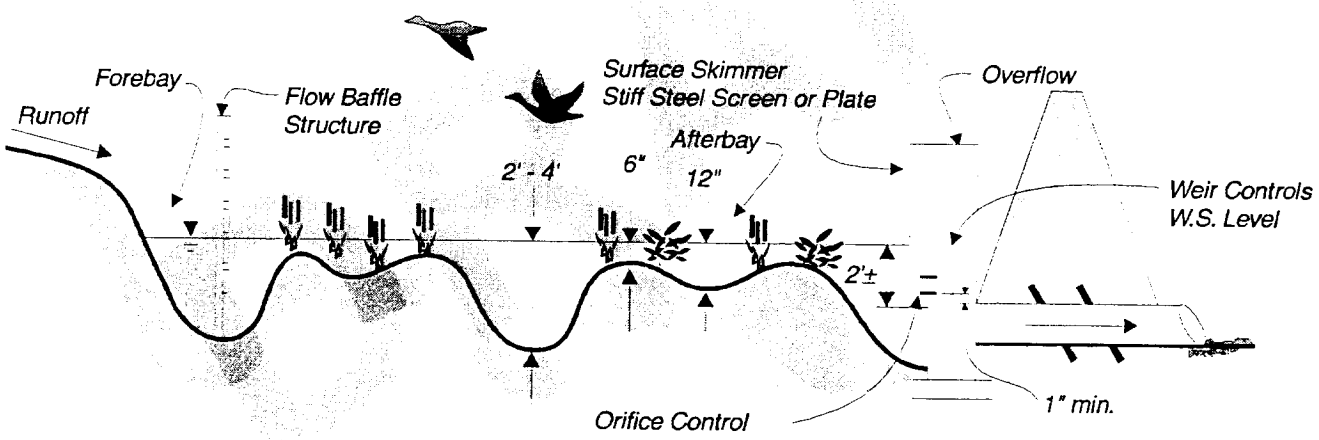
Constructed wetlands offer an attractive, effective means for improving stormwater quality. As part of a landscape design, a constructed wetland can offer the beauty of water and vegetation in a predominantly dry area, if base flow is available or provisions are made to maintain the permanent pool. This BMP offers the potential for wildlife habitat and passive recreation. A constructed wetland could be used in a park-like area where housing development residents stroll or conduct bird watching, for example. A constructed wetland could also provide a shady green space where employees at a commercial or industrial site could enjoy a lunchtime outdoors.



Adapted from UDFCD, 1992

Figure CW - 1

Constructed Wetlands (Plan)

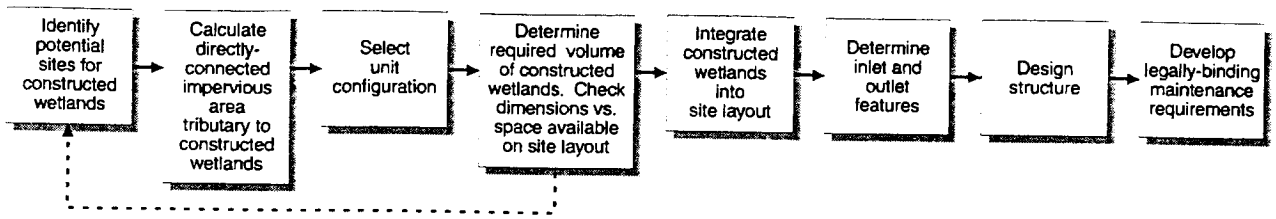


Adapted from UDFCD, 1992

Figure CW - 2

Constructed Wetlands (Section)

The aesthetic advantages of constructed wetlands are complemented by their effectiveness as a stormwater quality management BMP. Wetlands remove a variety of constituents. Some drainage structures, such as flood control channels, function as wetlands if a permanent pool forms. Constructed wetlands may be intentionally incorporated into a design for any land use where space is available and wetland species can be established. The flow chart on the following page provides general guidance for planning a constructed wetland in a site design.



As noted in the above chart, constructed wetlands are designed based on a capture volume, much as wet detention basins (wet ponds) are. Wetlands would be well suited for many sites where a wet detention basin could be used. Constructed wetlands, however, require more land space than wet detention basins for similar drainage areas because part of the constructed wetland must be shallower than a wet detention basin.

The potential for variation in depths throughout the wetlands (see Figure CW-2) and the use of vegetation, however, provide more interest and flexibility for landscape architecture purposes than does a simple wet pond. Variations in depth and irregularly-shaped pools also make a constructed wetland more natural looking.

Vegetation in the wetland decreases the potential for short-circuiting (flow through the basin more rapidly than desired) caused by wind, but can be expensive to establish and maintain.

A constructed wetland for stormwater quality management purposes requires:

- Adequate space (typically 1 to 2 percent of the tributary watershed)
- Soils suitable for establishment of wetland vegetation
- A need or desire for landscape interest or a wildlife area
- Commitment to maintaining the wetlands

Design Considerations

Design constructed wetlands in the same manner as wet detention basins, using a shallower depth. Each constructed wetland shall have a forebay and an afterbay (optional, 3 to 6 feet deep), which collectively make up 25 to 50 percent of the entire wetland area. A shallow pool can extend laterally across the basin.

Side slopes should be at least 10:1 for littoral zone down to a water depth of 2 feet, with freeboard as required by the appropriate agency. Access must be provided for maintenance vehicles to reach the forebay, outlet and perimeter.

Install inlet energy dissipators (flow baffle) and design the wetlands to have a length to width ratio of 3:1 or 4:1 to minimize the occurrence of short-circuiting and dead areas. Length to width ratios of 2:1 can be used if measures to prevent short-circuiting, such as baffling, are incorporated into the design in a manner that will not impede wetlands maintenance. Figure CW-3 illustrates the length to width ratio. Compaction, clayey soils and artificial liners should be used to minimize exfiltration.

Supplemental water may be required to keep vegetation alive in dry periods. If mosquitoes are a problem, the forebay (deep water only) can be stocked with Gambusia fish (mosquito fish), if approved by the Department of Fish and Game and other appropriate agencies.

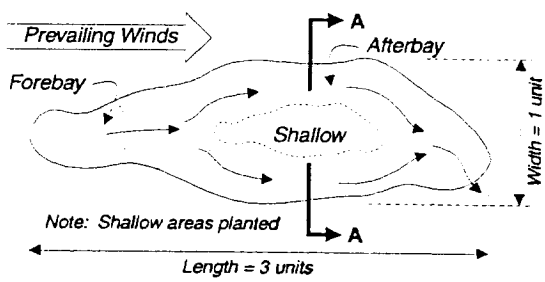
Table CW-1 shows vegetation species recommended for constructed wetlands. The selection of plant species for a constructed wetland shall take into consideration the water fluctuation likely to occur in the wetland. Some species listed below have other factors affecting their successful growth as well. See Reference NRCS-FOTG for additional information on the species listed below.

Table CW-1
Vegetation Species Recommended for Constructed Wetlands

Species Recommended in the Natural Resource Conservation Service Field Office Technical Guide	
Common Name	**Scientific Name**
Alkali bulrush	Scirpus robustus
Creeping wild rye	Elymus triticoides
Reed canarygrass	Phalaris arundinacea
Barnyard grass	Echinocloa crusgalli
Other Recommended Species	
Common Name	**Scientific Name**
Cattail	Typha latifolia
Spikerush	Eleocharis species
Tules	Scirpus species
Common reed	Phragmites communis
Sedges	Carex species
Rushes	Juncus species

In summary, the design steps for constructed wetlands are:

- Determine the constructed wetland volume.
- Design the constructed wetland shape in accordance with site constraints, slope requirements, required fore/afterbay sizes, and aesthetic objectives.
- Design inlet and outlet structures.
- Designate shallow/vegetated areas.
- Select wetland species and layout planting/stocking scheme (consult wetland ecologist, wetland plant ecologist, or wetlands restoration firm).



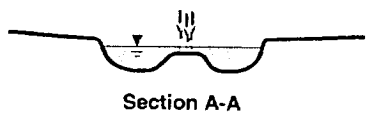


Figure CW – 3
Length to Width Ratio

- Require wetland ecologist for construction inspection and vegetation installation.

During design of the wetlands, the designer shall coordinate the design with the local, state, and federal agencies regarding wetlands regulations. It is imperative that the functional purpose of the constructed wetlands as a stormwater quality control BMP be recognized by the agencies to minimize future maintenance issues, such as cleaning deposits out of the forebay and the afterbay.

Maintenance and Inspection Requirements

Constructed wetlands require periodic maintenance and inspection including the following practices:

- Inspect constructed wetlands a minimum of twice a year, before and after the rainy season, after large storm events, or more frequently if needed.
- Remove accumulated undesirable debris and repair erosion.
- Clean forebay every two years at a minimum, to avoid accumulation in main wetland area. Environmental regulations and permits may be involved with the removal of wetland deposits. When the main wetland area needs to be cleaned, it is suggested that the main area be cleaned one half at a time with at least one growing season in between cleanings. This will help to preserve the vegetation and enable the wetland to recover more quickly from the cleaning.
- Control mosquitoes as necessary.
- Prepare a maintenance manual and submit it to the appropriate agency.
- Report on maintenance to the appropriate agency.

Appendix A
Hydrology for Flow Based Controls

Design Storm Flow Rate Calculation

The Stormwater Quality Design Flow (SQDF) for flow-based controls has an associated *return period* and *duration*. The *return period* of the SQDF in Ventura County is the defined in this Appendix. The *duration* of the water quality design storm is that which will yield the peak rate of runoff and is typically equal to the time of concentration of the contributing drainage area.

Hydrologic calculations for design of flow-based stormwater quality BMPs in Ventura County shall be in accordance with latest edition of the Hydrology Manual produced by Ventura County Public Works Agency, Flood Control and Water Resources Department, together with the hydrologic multipliers set forth herein. Where jurisdictions within Ventura County have approved alternative hydrologic calculation methods, the alternative methods may be utilized if they have been approved by the jurisdiction for use in design of flow-based stormwater quality BMPs.

Standard Calculation Procedure

1. The Storm water Quality Design Flow (WQDF) in Ventura County is defined as $Q_{P,\,WQDF}$.

2. Calculate the peak rate of flow from 50-year storm ($Q_{P,\,50\,yr.}$) using the procedures set forth in the Hydrology Manual.

3. Convert $Q_{P,\,50yr}$ (Step 2) to $Q_{P,\,WQDF}$ (Step 1).

$$Q_{P,\,WQDF} = M \cdot Q_{P,\,50yr}$$

$$M = \frac{(M_I)(A_I)+(M_P)(A_P)}{A_I + A_P} = \text{Weighted Hydrologic Multiplier}$$

M_I and M_P and A_I and A_P are the hydrologic multipliers (see Table A-1) and areas of the impervious and pervious portions of the area tributary to the BMP. $A_I + A_P = A_T$ where A_T is the total area tributary to the BMP.

Table A-1 Hydrologic Multipliers							
Watershed Cover Type	Storm Return Period - n yr.						
	SQDF	2	5	10	25	50	100
Impervious Areas $M_{I, n\,yr.}$	0.10	0.16	0.45	0.68	0.83	1.00	1.20
Pervious Areas $M_{P, n\,yr.}$	0.06	0.08	0.23	0.40	0.7	1.00	1.38

Example Design Storm Flow Calculation

The steps below show an example calculation for a swale (BMP IN).

Step 1: Design Flow = $Q_{P, WQDF}$

Step 2: Calculate the peak rate of flow from a 50-year storm.
$Q_{p, 50\,yr.}$ = 10 cfs from the Hydrology Manual

Step 3: Convert $Q_{p,50\,yr}$ (Step 2) to $Q_{p, WQDF}$ (Step 1)

From Table $\begin{cases} M_{I, WQDF} = 0.10 \\ M_{p, WQDF} = 0.06 \end{cases}$ From Project Plans $\begin{cases} A_I = 6 & \text{(Impervious area)} \\ A_p = 3 & \text{(Pervious area)} \end{cases}$

$$M = \frac{(0.10)(6)+(0.06)(3)}{6+3}$$

= 0.09 Weighted Hydrologic Multiplier

$Q_{p, WQDF}$ = 0.09 x 10 cfs
= 0.9 cfs

Design Peak Flow = 0.9 cfs

Appendix B
Unit Basin Storage Volume Sizing Curves

This appendix is for use in sizing detention basins, media filters and constructed wetlands. It contains curves which show the percent of runoff that may be captured by units of various volumes, according to the amount of impervious area on a site.

40-hour Detention Storage Volume Analysis

The percent capture curves for 40-hour detention included in this appendix were developed using the Storage, Treatment Overflow Runoff Model (STORM). STORM was applied to long-term, hourly rainfall data at rain gauges across Ventura County. Based on this analysis, 4 gauges were selected as being representative for sizing detention storage facilities (Figure B-1). Taking into consideration the average annual rainfall and topography across the county, zones were drawn to reflect these 4 gauges. The sizing curves should apply to most areas within each zone. Zone boundaries, however, are approximate and certain areas within each gauge zone will be strongly influenced by topographic features.

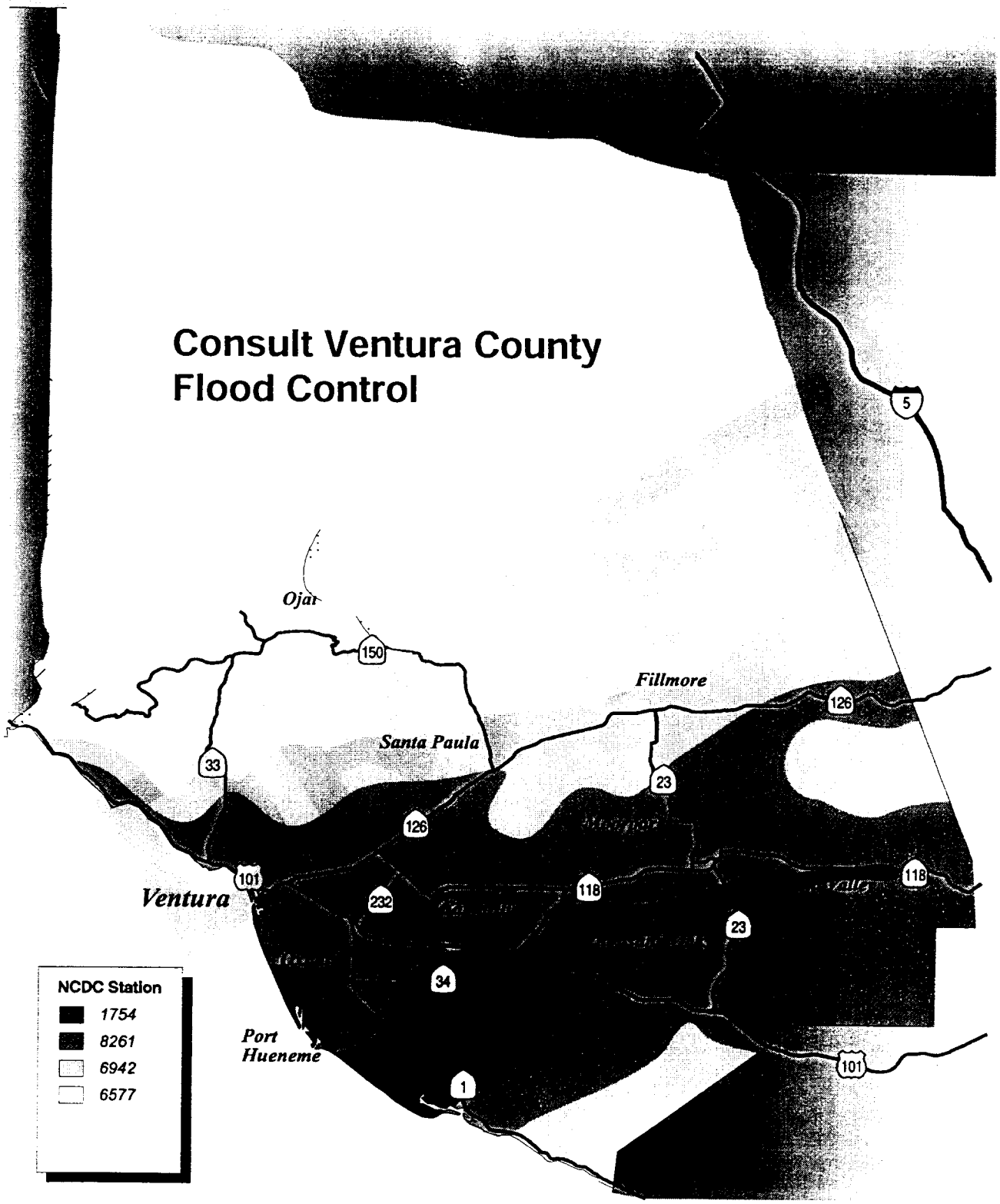
The following pages include percent capture curves for the applicability zones, by National Climactic Data Center station numbers: 1754; 6577; 6942; and 8261.

Example Use of Unit Basin Storage Volume Curves Sizing a Basin

- Locate your site on Figure B-1, and identify the associated NCDC station. Example: A Fillmore site in the area for station 6577.
- Determine the area of drainage, A_t. Example: 10 acres.
- Determine the area of impervious surfaces in drainage area, A_i. Example: 6 acres.
- Calculate the percentage of directly connected impervious area, $\%DCIA = (A_i / A_t)*100$
  Example: $\%DCIA = (A_i / A_t)*100 = (6 \text{ acres}/10 \text{ acres})*100 = 60\%$
- Determine the percent capture. Use 75 annual percent capture in Ventura County.
- Determine the unit basin volume, V_u using the curves. Interpolate between curves, if necessary. For %DCIA of 10 percent or less, consult Ventura County Flood Control District for an appropriate unit basin sizing technique.

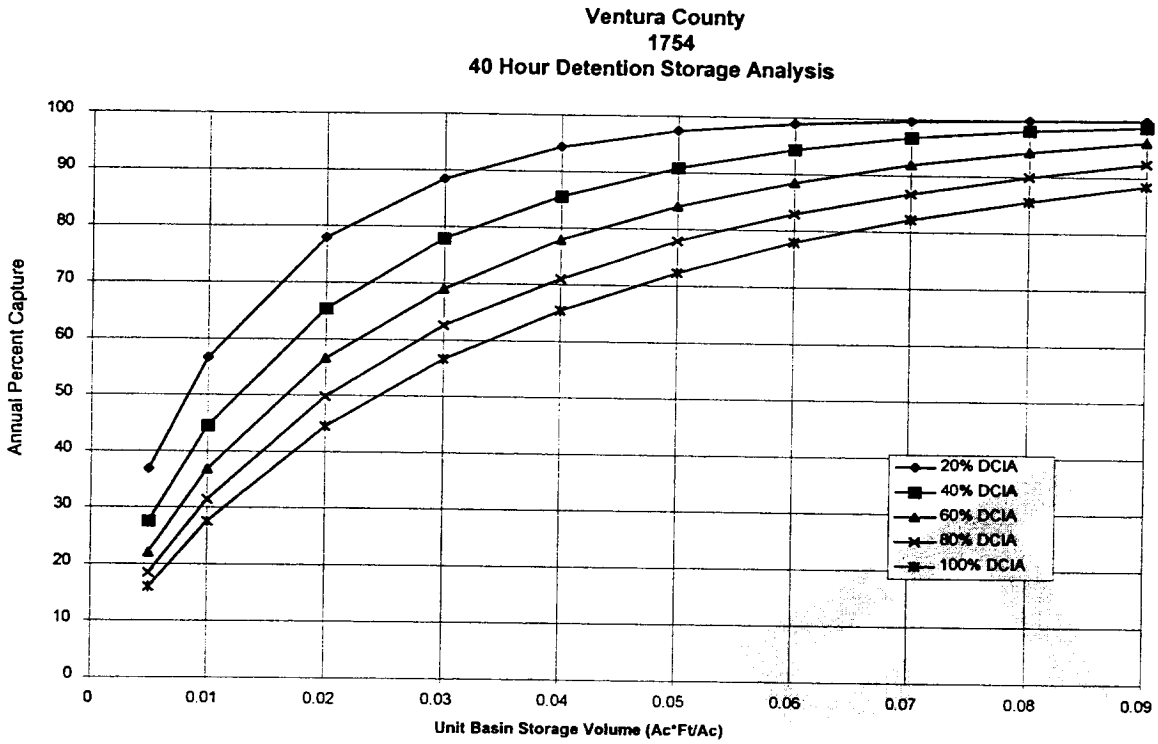
  Example: Station 6577, %DCIA = 60%, Annual Percent Capture = 75%, $V_u = 0.054$ ac-ft/ac.
- Calculate the volume of the basin, V_b, where $V_b = V_u * A_t$.

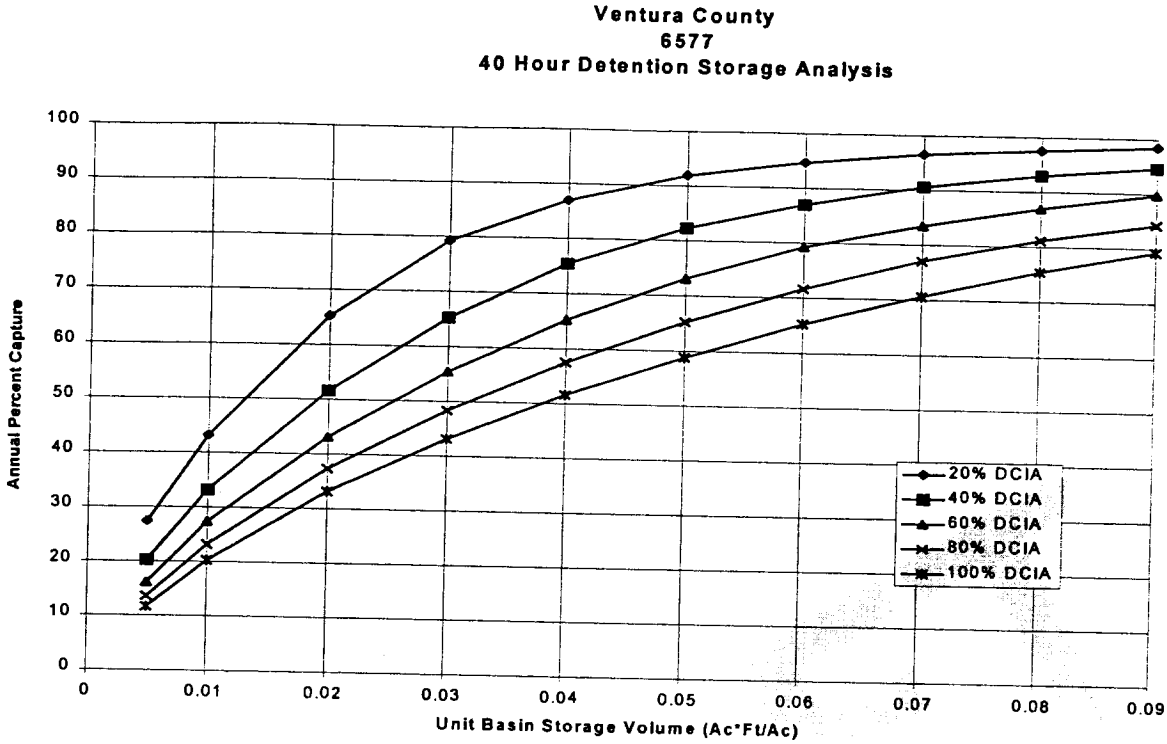
  Example: $V_b = 0.054$ ac-ft/ac*10 ac = 0.54 ac-ft.
- Solution: Size the basin for 0.54 ac-ft and 40-hour drawdown.



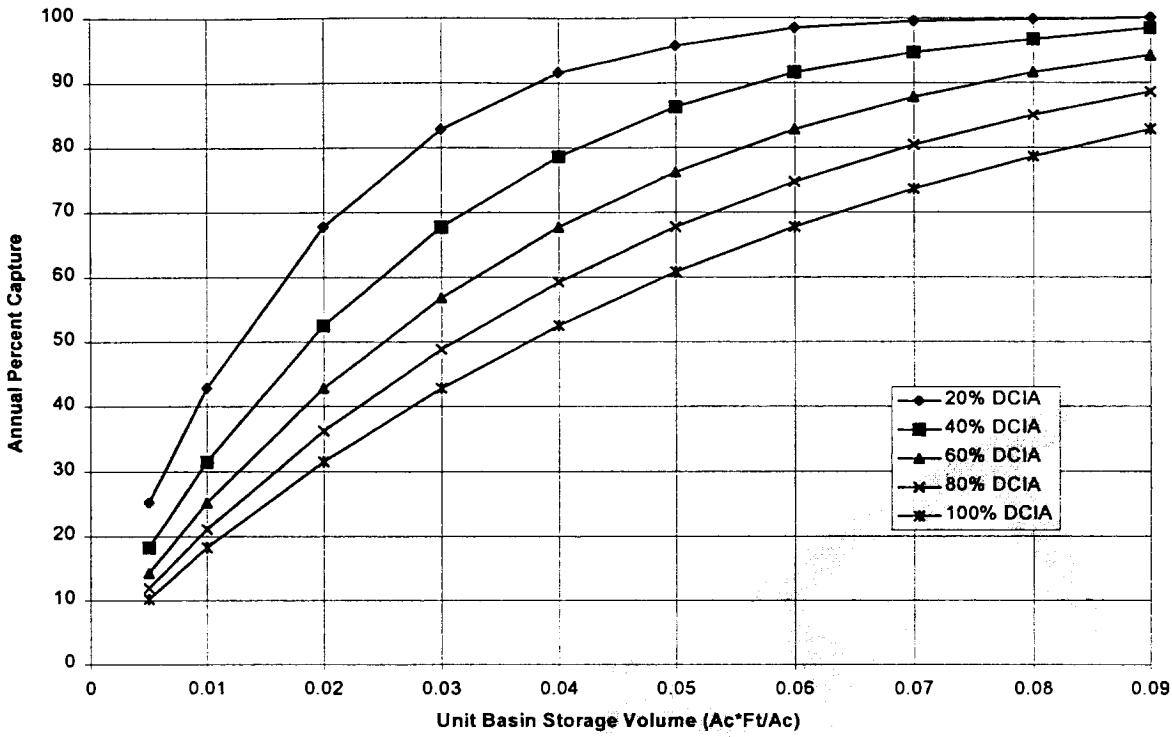
No Scale

Figure B-1

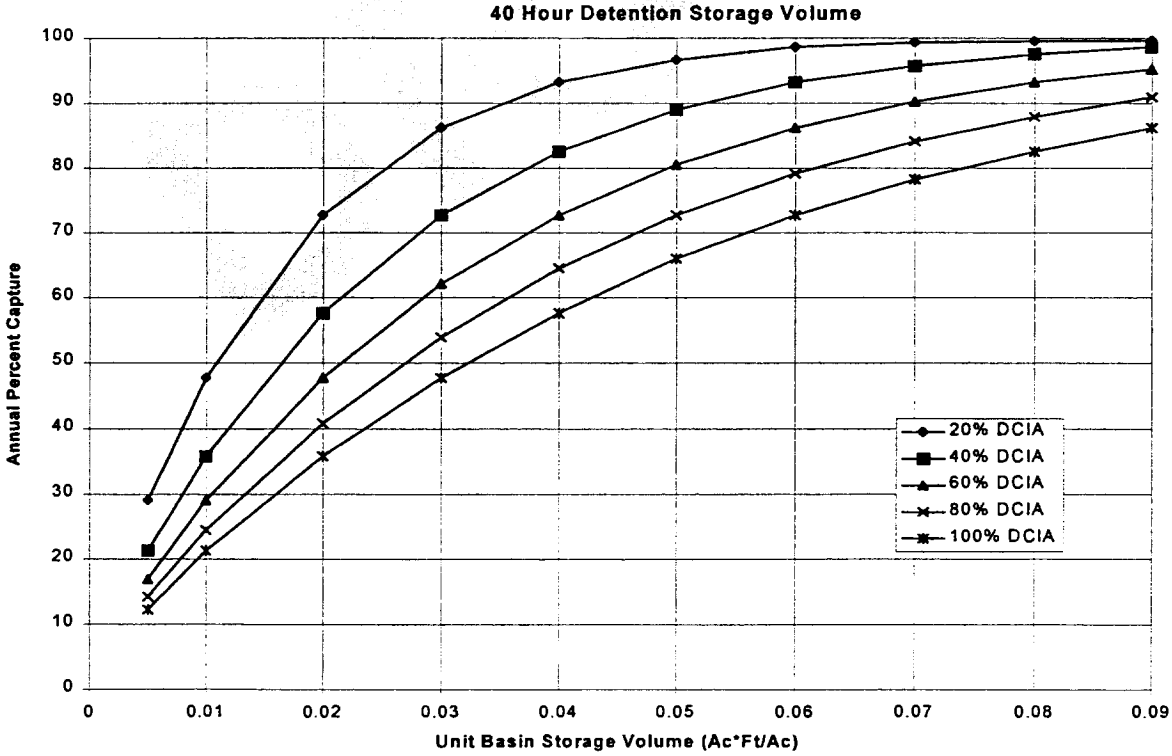

Ventura County
1754
40 Hour Detention Storage Analysis
Annual Percent Capture
100
90
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Unit Basin Storage Volume (Ac*Ft/Ac)
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA


Ventura County
6577
40 Hour Detention Storage Analysis
Annual Percent Capture
100
90
80
70
60
50
40
30
20
10
0
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
Unit Basin Storage Volume (Ac*Ft/Ac)
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA

Ventura County
6942
40 Hour Detention Storage Analysis



Ventura County
8261
40 Hour Detention Storage Volume



Appendix C
Hydrologic Soil Groups

This appendix includes information on the Hydrologic Soil Groups in Ventura County to use in designing various BMPs:

- Relevance of Hydrologic Soil Groups Information
- Hydrologic Soil Groups

Relevance of Hydrologic Soil Groups Information

The hydrologic soil groups of a development area are pertinent to Best Management Practice design for BMP IN, Infiltration Facilities and for identifying sites appropriate for detention basins. The predominant soil group will control the effectiveness of infiltration facilities or the suitability of an area for impounding water. Hydrologic soil group information should be used for preliminary siting studies only. Actual design should be based on in-situ soil investigations and testing by a qualified engineer or geologist.

Table C-1
Typical Infiltration Rates

Soil Type (Hydrologic Soil Group)	*Soil Type VCFCD*	*Infiltration Rate (in/hr)*
A	6,7	1.00 -8.3
B	4,5	0.5 -1.00
C	2,3	0.17-0.27
D	1	0.02-0.10

Infiltration Rates shown represent the range covered by multiple sources, e.g. ASCE, BASMAA, etc.

Hydrologic Soil Groups

The hydrologic soil groups are classified by the USDA Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service. There are four hydrologic soil groups: A, B, C and D. Soils may be classified by two groups. Soil groups A and B have the highest infiltration rates, unless the soils under consideration have been compacted during construction. Soil groups A and B typically are appropriate for storm runoff infiltration. Sites with soil groups C and D are more appropriate for detention basins.

Soils in group A have a low runoff potential and high infiltration rate, as the soils typically are sands and gravel. Soil group B includes soils with moderate infiltration rates when completely wetted. Group B soils are sandy loam soils with moderately fine to moderately coarse textures. Soils in group C have slow infiltration rates when thoroughly wetted and these soils typically are silty-loam soils with an impeding layer or soils with moderately fine to fine texture. Group D soils have a high runoff potential and very slow infiltration rate when thoroughly wetted. Group D soils include clay soils with high swelling potential, soils in a permanent high water table and shallow soils over nearly impervious material.

The hydrologic soil information presented here should be used as a general overview. For more specific information, consult the Ventura County Soil Survey or contact the Ventura County Resource Conservation District at (805) 386-4685.



Rapid Watershed Planning Handbook

A Comprehensive Guide for Managing Urbanizing Watersheds

October 1998



CENTER FOR
WATERSHED
PROTECTION
Ellicott City, Maryland

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Preface

Communities across the nation are finding that their water resources are degrading in response to growth and development. They are also discovering that they can only protect these local water resources by thinking on a watershed-level. The settings of local watershed management efforts are indeed diverse. For example, some communities are trying to save salmon habitat in the Pacific Northwest, while others strive to maintain groundwater quality in the Southwest. A mid-western community seeks to prevent lake eutrophication, while a New England community wishes to keep shellfish beds open, and a Northeastern community works to keep a pure drinking water supply.

Yet other communities work at the watershed level to sustain trout populations in the Great Lakes, to stem the decline in biodiversity of warmwater streams in the Southeast, to protect endangered salamanders in the Texas springs, or to meet bacteria standards along California beaches. Other communities look to the watershed to reduce algal blooms in the estuaries of the Carolinas and Chesapeake Bay, to protect coral reefs in the Florida Keys, or to restore habitat in degraded urban streams of the Mid-Atlantic.

While the settings and resource issues that drive local watershed protection are diverse, communities often find that many of the same tools and techniques appear to work in every watershed. This handbook condenses some of this local knowledge and experience in a single reference to help other communities solve their local watershed problems.

Watersheds are important to any community because they embody our sense of place in the landscape, and their waters are important in our daily life. Some of the many interactions between ourselves and urban watersheds are described below. In an important sense, watersheds are the geographic address for our community, and provide a common and unifying goal to rally around.

In Our Daily Life	Where We Recreate	In the Natural Ecosystem
flooding and erosion	fishing	food chain
drinking water	swimming	habitat
food (shellfish, fish)	boating	migratory stop-overs
kids playing in creek	hiking trails and greenways	
property drainage	bird watching	

Communities quickly find many reasons to protect local watersheds-whether it is because of economic benefits, recreation, flood prevention, scenery or the overall quality of life. Different groups of people often have their own unique rationale for protecting watersheds. Some may

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place a high value on the aquatic biological community living in these waters, while others will be more concerned about reducing stream channel erosion to the real estate in their back yard. Regardless of the reasons, it is clear that most communities now recognize the value of local watershed protection.

It is certainly true, however, that watershed planning has not always lived up to its promise. Some communities have found that some of their past watershed planning efforts have not always protected local water resources adequately, i.e, measurably reduced the cumulative impacts of watershed development over the long run.

This failure of many watershed planning and implementation studies is often termed the "dusty shelf syndrome", as in the watershed study that is consigned to the shelf never to be read or implemented. In talking with watershed planners around the country, we have been told that the dusty shelf syndrome is caused by some of the common planning pitfalls outlined below. The rapid watershed planning approach advocated in this handbook was developed expressly to avoid these pitfalls.

1. **Plan is conducted at too great a scale**--the focus becomes too vague; too many subwatersheds are considered; impact sources are often impossible to identify; too many stakeholders are involved and implementation responsibility is diminished; monitoring and implementation costs skyrocket; and non-urban sources confound protection efforts

2. **Plan is a one-time study rather than a long-term and continuous management commitment**--plan does not fully commit resources and authority to a long-term process and after a period of time the report and recommendations are lost to competing priorities

3. **Plan lacks local ownership and key stakeholder involvement in the watershed management process**--responsibility is handed off to consultants or technical staff; internal consensus and support are not generated and few stakeholders are involved in the process; consensus and support are not provided for elements which may be controversial

4. **Plan does not address the issue of land use change within the watershed**--land use change is not accurately predicted in response to zoning or master plans; consideration of alternative land uses or densities and prediction of impacts are not incorporated in plan

5. **Budget for watershed plan insufficient**--plan scope is too broad and ambitious for available funds; baseline mapping and monitoring often exhausts budget with little left for management process, stakeholder involvement, or implementation

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6. **Plan focuses on the tools of watershed analysis rather than watershed management outcome**--consultants and planners are overly fascinated with tools such as GIS, computer simulation modeling, and intensive monitoring with little attention is devoted to management outcome with respect to land use and practices

7. **Document was too long or complex**--documents often exceed several hundred pages with appendices and are too complex for most stakeholders; decision-makers are not able to find or understand watershed management recommendations

8. **Plan does not assess adequacy of existing local program to implement management recommendations**--plan does not review existing elements of local government or entity to evaluate if capability exists to implement recommendations; there is no critical evaluation of authority to affect land use approvals, or to see whether funding, staffing, enabling ordinances, or regulations are adequate to implement plan

9. **Plan recommendations were too general**--recommendations often general as in: better erosion and sediment control (ESC), need for better agency coordination, wider use of stormwater BMPs, or need for long term watershed monitoring, with no specifics on how to fund programs, what ordinances will require wider use of BMPs or ESCs, how to achieve better agency coordination, or what, when and who will conduct monitoring; management recommendations do not assign resources, responsibilities and timetables

10. **Plan had no requirements or meaning**--no regulation or requirement is in place to mandate use of plan; land development is not required to conform to specific criteria or maps in plan

The Center's Approach to Watershed Management

Our basic philosophy is that watershed planning is simply a process to get communities to make better choices about future growth. In particular, we feel that an ideal watershed plan should be:

- **scientifically credible** based on the best science that is available;
- **democratic** in that a group of real citizens and watershed interest groups can prepare them;
- **effective** such that we are reasonably confident that we can achieve the water resource goals set for the watershed if the plan is fully implemented;

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- **locally-based** with a strong focus on smaller subwatersheds that contain headwater streams;
- **adaptable** to the many different ecoregions of the country;
- **versatile** so that the method can be applied to solve diverse watershed problems, such as: protect trout, a drinking water supply, a beach, an aquifer; prevent lake eutrophication, stream degradation; or restore stream quality;
- **economically defensible** so that the needs for economic growth are balanced against the benefits of watershed protection;
- **inexpensive to prepare** so that it functions much like a Model-T (it doesn't take a lot of time or money to get started) so that scarce funds can be conserved for actual implementation; and,
- **rapid**, since development can occur very rapidly, it is possible to dramatically change watershed quality in a few decades. Therefore, a brief planning phase should quickly lead to on the ground implementation of specific management tools in less than a year.

We have tried to keep these goals in mind as we wrote this handbook, and continue to refine our approach to better meet these challenging goals. It is important to note that our planning approach is primarily geared for watersheds that are expected to experience growth pressures. It doesn't work well for watersheds that are expected to remain in a rural or undeveloped condition, and are dominated by agriculture, timber, surface mining or grazing operations.

How to Use This Handbook

The audience for this handbook is the mythical "watershed manager"--a person who has the job of getting a group of people to come to an agreement on a local watershed plan and then implement it. We have tried to organize the handbook to help a watershed manager get this job done as rapidly as possible. As such, the handbook is divided into four parts.

Part 1, contains four chapters that present the nuts and bolts of urban watershed protection, with a strong emphasis on practical techniques for crafting a plan, and a review of the major tools that are applied to protect urban watersheds.

> **Chapter 1: Basic Concepts of Watershed Protection** describes fundamental concepts that need to be understood before embarking on a watershed plan.

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Chapter 2: The Tools of Watershed Protection outlines the eight major watershed management tools that are critical to a watershed plan, and describes a range of techniques to implement the individual tools. Because of the fundamental importance of impervious cover, this chapter highlights land use planning techniques that can shift the amount and location of impervious cover among different subwatersheds.

Chapter 3: Crafting a Watershed Plan presents an eight step process for putting a plan together for a watershed and its individual subwatersheds. The process guides a watershed manager through the many hard choices involved in developing and implementing a plan.

Chapter 4: Customizing Subwatershed Plans to Meet Water Resource Goals presents a series of subwatershed management "templates" to meet different local water resource goals. The templates indicate how the eight major watershed management tools can be adapted for different streams, lakes, reservoirs, estuaries and aquifer settings.

Part 2. Methods for Watershed Protection, is more technical, and contains five chapters that help a watershed manager design a more cost-effective watershed plan.

Chapter 5: Budgeting for Watershed Protection provides detailed information on the comparative cost of the many mapping, modeling, monitoring and management options that might be needed to support and justify a watershed plan. The chapter also introduces the concept of the *basic subwatershed plan*, which yields the minimum management information needed to support a plan.

Chapter 6: Estimating Current and Future Impervious Cover compares four techniques for measuring and forecasting impervious cover within individual subwatersheds. The Chapter helps a watershed manager choose the most appropriate method for this critical indicator of watershed change.

Chapter 7: Subwatershed Mapping outlines some of the methods and techniques that are used to show the spatial implementation of a subwatershed plan. The chapter emphasizes a simple approach to develop subwatershed and aquatic corridor maps that support a watershed plan.

Chapter 8: Rapid Monitoring Techniques describes some of the more rapid and low cost techniques to characterize stream quality, with a strong emphasis on physical and biological monitoring techniques that can be used as long-term indicators of watershed health.

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Chapter 9: Special Watershed Analyses and Subwatershed Surveys helps a watershed manager decide whether any additional mapping, modeling or monitoring support needs to added to the scope of a watershed plan. The Chapter examines three common watershed-wide analyses— flood management, TMDLs and greenways, and also describes subwatershed surveys, and provides some tips on how to select the most appropriate model for a watershed study.

Part 3, Putting a Plan Together takes the watershed manager through the process of preparing a subwatershed plan in the real world.

Chapter 10: The Practice Plan provides a sample subwatershed plan for a hypothetical subwatershed known as Cameron Branch. The example takes the reader through the eight steps of crafting a subwatershed using a realistic land use scenario.

Chapter 11: Real World Watershed Plans presents eight real world watershed planning case studies from around the country that illustrate both different planning approaches and local water resource goals.

Part 4. Additional Resources for the Watershed Manager. Appendices at the end of the handbook provide greater detail for a watershed manager interested in special topics, such as budgeting, modeling selection, monitoring methods, watershed economics and management structures. In addition, a reference guide is provided that highlights useful resources for putting a plan together. Also, a glossary is included that defines some of the arcane terminology cited in the handbook.

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Introduction

A Guide to Better Site Planning

This guide represents the culmination of a four–year effort to examine new ways to reduce pollutant loads and protect aquatic resources through non–structural practices and improved construction site planning. During the project it was quickly realized that a fundamentally different approach toward development was needed to reliably protect streams and other aquatic resources. This guide describes a new approach to site planning and recommends how it can be implemented at the local level. A recurring theme is that the new site planning approach makes more environmental and economic sense than traditional subdivision codes.

This guide is aimed at all those who participate in site planning at the local level—plan reviewers, developers, engineers, landscape architects, local officials, and concerned citizens. It is hoped that each participant can find some useful ideas within the guide to improve the quality and outcomes of site plans.

Organization

The guide is organized into seven main chapters:

1. A Stream Protection Strategy
2. The Importance of Imperviousness
3. Watershed–Based Zoning
4. Stream Protection Clusters
5. The Architecture of Stream Buffers
6. Headwater Streets
7. Green Parking Lots

The first chapter, *A Stream Protection Strategy*, outlines a comprehensive framework for effective stream protection at the local level that utilizes an integrated development review process through each stage of the development cycle. The many advantages of this resource–driven approach are then described. Next, the chapter documents how three decades of traditional development standards and subdivision codes have not served their purpose. These outdated regulations result in needless impervious area, consumption of green space, and inadequate protection of resource areas and streams. A strong case is made that modest reforms of inflexible local development regulations can produce significant improvements in the future quality of streams and the community.

Chapter 2, *The Importance of Imperviousness*, is a thorough review of natural research on the impact of imperviousness on aquatic systems. The review concludes that even relatively low levels of impervious cover can produce significant and often irreversible impacts on streams and other aquatic resources. A key theme is that impervious cover can be used as a quantitative measure to test the effectiveness of site planning practices.

Chapter 3, *Watershed-Based Zoning*, examines how the measurement of impervious cover can

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be a more reliable and enforceable link between individual site plans and the larger watershed in which they are built. An urban stream classification scheme based on future impervious cover is outlined and the merits of impervious cover are then discussed as the basis for watershed–based zoning. The chapter outlines the steps needed to institute watershed–based zoning at the local level and concludes with a discussion on how specific stream protection strategies can be adapted within individual subwatersheds.

Chapter 4, *Stream Protection Clusters*, examines a series of alternative development patterns that can sharply reduce the amount of impervious cover created at a site. These development patterns concentrate on cluster development in a smaller area served by a shorter road network. Many localities already allow cluster development; however, it has seldom been used for the explicit purpose of reducing impervious area. A new model for cluster development is presented that can be easily implemented by local governments to build more attractive and economic communities.

Chapter 5, *The Architecture of Stream Buffers*, documents the critical importance of buffers in the urban landscape. Twenty key benefits of buffers are reviewed. In addition, the chapter documents the experience that local governments have had in implementing effective stream buffer programs. The chapter concludes with detailed, but flexible performance standards that ensure that buffers are protected and maintained through each stage of the development cycle.

Chapter 6, *Headwater Streets*, investigates the potential of reducing imperviousness through narrower residential streets, smaller cul–de–sacs, and shorter driveways. Present local road design standards have resulted in needless impervious cover and unsafe speeds. A revised residential street classification system is presented that forms the basis for more effective performance standards for street design. The chapter also provides guidance on integrating structural practices along streets to provide the most effective control of runoff quality.

In the last chapter, *Green Parking Lots*, further reduction of impervious cover is possible in new commercial parking lot design. The "green parking" approach downsizes parking areas, thus limiting the creation of unnecessary impervious cover while still providing convenient access for motorists. A strong case is made that current local parking codes result in parking lots that are much larger than needed. From the experience of local planners, new performance criteria are proposed to curb excess parking, utilize smaller parking stalls, and design more effective best management practices (BMPs) for parking lots.

A glossary at the end of the guide provides definitions of the many planning and engineering terms involved in site planning.

The guide illustrates how innovative site planning tools can be integrated into the overall BMP system for a development site. Such tools act to reduce impervious area, protect resource protection areas, and retain

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green space. Most importantly, the guide makes a strong case that when these tools are applied together, the result is generally better for the community, the stream and the developer.

Many of the issues in this manual are explored in greater depth in a series of four guidance documents that are available from MWCOG.

- Riparian Buffer Strategies for Urban Watersheds
- Cluster Development Strategies for Urban Watersheds
- Residential Street Strategies for Urban Watersheds
- Clearing and Grading Strategies for Urban Watersheds

Author's Note

The purpose of this guide is to present a new way of thinking about site planning to better protect streams. As a result, the guide is peppered with many numerical examples of new performance criteria. While these new criteria are thought to be an improvement over existing subdivision codes and standards, it is important to carefully and critically evaluate each one within the context and character of the existing community or region. After all, it has been the uncritical acceptance of design standards in the past that has often led to many present stream protection problems.

Acknowledgements

The production of this guide was primarily funded by the U.S. Environmental Protection Agency (EPA) Office of Wetlands, Oceans and Watersheds, with matching funds from the MWCOG. The Center for Watershed Protection also contributed funds to complete the effort. The guide could never have been produced without the cooperation, insights and experience of over 200 local planning agencies from 43 US states. Staff members of these agencies participated in surveys, provided literature and ordinances, and gave advice over the phone. The help of these agencies, listed below, is gratefully acknowledged.

Thanks are also extended to EPA staff whose guidance and patience were instrumental in completing this guide. They include Anne Beier (project officer), Robert Goo, Rod Frederick, and Dov Weitman, as well as each of EPA's regional nonpoint source coordinators. This guide also reflects the hard work of a number of MWCOG staffers, including Lorraine Herson-Jones, Kathy Corish, Maureen Heraty, Lynne Stabenfeldt, Peter Kumble, Mark Pfoutz and many others. Their input is gratefully acknowledged.

The author would also like to express thanks to the staff at the Center for Watershed Protection for their capable and patient work in producing the final document, with kudos to Arlene Allegretto, Jennifer McLean, Donna DeMars Claytor and Dean Geiser.

Disclaimer

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Points of view expressed in this guide do not necessarily reflect the views or policies of the EPA or MWCOG.

Partial List of Planning Agencies That Contributed To This Study

Alaska

Alaska Coastal Zone Program
City of Juneau

Arizona

City of Scottsdale
City of Tempe
Maricopa County
Pima County

Arkansas

City of Little Rock
Fayetteville
Town of Maumelle

California

California Coastal Commission
City of San Bernardino
City of San Luis Obispo
Marin County
Monterey County
Placer County
Sacramento County
South Lake Tahoe

Colorado

Breckenridge County
City of Aurora
City of Boulder
Town of Fort Collins
Town of Loveland
Town of Colorado Springs
Summit County

Connecticut

City of Cromwell
Town of Avon
Town of Hebron
Town of Marlborough

Delaware

City of Dover

Florida

Broward County
Collier County
City of Orlando
Dade County
Franklin County
Monroe County
South Florida WMD
Volusia County

Georgia

City of Gainsville
Douglassville
Atlanta Regional Commission
City of Atlanta
Fulton County
Gwinnet County

Illinois

Dupage County
Flossmor
Lake County
Northeastern Illinois Planning Comm.
Town of Lake Villa

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Village of Matteson

Indiana

City of Bloomington
City of Indianapolis
Tippecanoe County

Iowa

City of Ames
City of Dubuque
Iowa City
Polk County
Town of Johnston

Kansas

City of Overland Park
City of Wichita
Topeka/Shawnee County

Louisiana

Baton Rouge City/Parish
Planning Commission
City of New Orleans
Jefferson Parish
Louisiana CZM Program
St. Charles Parish

Maine

Cobosee Watershed District
City of Augusta
Lakes Environmental Assoc.
Maine Shorelands Zoning Unit
Portland Water District

Maryland

Anne Arundel County
Baltimore County
Carrol County
Charles County
City of Annapolis
Chesapeake Bay Critical Area Commission
Howard County
Montgomery County
Prince Georges County

Massachusetts

Buzzard's Bay Project
Cape Cod Commission
Martha's Vineyard Commission
Town of Amherst
Town of North Andover
Plymouth
Town of Rochester
Town of Scituate
Sunderland
Yarmouth

Michigan

City of Ann Arbor
Grayling Township
Livingston County
Grand Traverse Bay
Oakland County/Township
Vergennes Township

Minnesota

Cass County
City of Bloomingtonn
Metropolitan Council
Mississippi Headwaters Comm
Town of Eagan

Mississippi

Central Mississippi Planning Department

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Missouri

Kansas City
City of Springfield
Greene County
St. Louis County

Montana

Lake County
Missoula County
Yellowstone County

Nebraska

City of Lincoln
Lower Platte Natural Res. District
Omaha Planning District

Nevada

Carson County/City
City of Reno
Tahoe Regional Planning Agency

New Hampshire

New Hampshire Office State Planning
Town of Ashland
Town of Exeter
Town of Gilford
Town of Pembroke
Town of Plymouth
Pemigewaset River Council

New Jersey

Atlantic County
Hackensack/Meadowlands Dev. Comm
Ocean County
Pinelands Commission Princeton Township
Somerset County
Township of Franklin
Township of West Windsor

New Mexico

Albuquerque-Bernalillo City
Town of Santa Fe

New York

Adirondack Park Agency
City of Albany
Town of East Hampton
Town of Mamaroneck
Westchester County
Village of Scarsdale

North Carolina

Carteret County
City of Raleigh
North Carolina Coastal Resources Comm
Orange County
Town of Chapel Hill
Wake County

Ohio

Miami County
Town of Troy
Town of Westlake

Oklahoma

Oklahoma City
Oklahoma County
Town of Norman

Oregon

City of Astoria
City of Corvallis
City of Eugene
City of Portland

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City of Salem
Marion County
Tillamook County

Pennsylvania

Bucks County
Milford Township
Pequea Township Montgomery County
Town of Penn Hills
Township of Buckingham

Rhode Island

RI Farm Preservation Program
Town of Natick
Town of North Kingston
Town of Tiverton
Town of New Shoreham

South Carolina

Colleton County
Charleston County
Dorchester County
SC Coastal Resources Council

Tennessee

Williamson County

Texas

City of Austin
City of Dallas
City of Forth Worth
City of Galveston
Lower Colorado River Authority
Town of Lubbock

Utah

Salt Lake City
Salt Lake County

Vermont

Town of St. Albans

Virginia

Chesterfield County
City of Newport News
City of Richmond
Fairfax County
James City/County
Loudoun County

Washington

City of Bellevue
City of Lacey
City of Olympia
City of Seattle
King County
Kitsap County
Pierce County
Skagit County

Wisconsin

Dane County RPC
Kenosha County
Southeast WI RPC
Town of Sun Prairie
WI Shorelands Protection Program

Wyoming

Teton County

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Chapter 19

Laws of Montgomery County 1985

Erosion, Sediment Control, and Storm Water Management

Article II. Stormwater Management

As a result of Bill No 45-84, effective August 31, 1984:

"An Emergency Act to provide for consideration of water quality impacts on streams and water quality features in storm water management designs; to add requirements of the Maryland Storm Water Management Act; to authorize the Director of the Department of Environmental Protection to approve storm water management plans and waivers; and to provide that the Director is responsible for implementing the Storm Water Management provisions of the Code.

By Amending

Chapter 19, Erosion,Sediment Control and Storm Water Management
Sections 19-20 through 19-28, 19-30,and 19-31
Montgomery County Code (1977 Replacement Volume as amended)"

Chapter 19, Article II, now reads as follows in its entirety:

9-20. Purpose of article; authority.

(a) It is the policy of Montgomery County to protect and promote the public health, safety and general welfare through the management of storm water to protect public and private property from damage, to reduce the effects of development on land and stream channel erosion, to assist in the attainment and maintenance of water quality standards and to preserve and enhance the environmental quality of stream valleys.

To accomplish these purposes, functional master plans for watershed conservation and management shall be prepared, public storm water management facilities shall be planned and programmed, and regulations for storm water management shall be promulgated. It is further the policy of the county that, insofar as practicable, and in conformance with this chapter, all development occurring within the county shall, as a minimum, be developed under a plan that minimizes water quality impacts on receiving streams and either contain on-site or provide off-site storm water management facilities adequate to control the increased runoff produced by the calculated two year storm, or at such other standard as state law or the department shall adopt. The location and storage requirements shall be determined as provided by this Chapter. In addition, a program for inspection and maintenance of storm water management shall be established by the executive.

(b) The Maryland Storm Water Management Act, under the Natural Resources Article, Section 8-11A-01 et. seg., of the Annotated Code of Maryland, provides that a grading or building permit may not be issued for a property unless a storm water management plan has been approved by the local jurisdiction. This Article does not infringe on the authority given to the district by state law.

(c) The county executive, or his designee, shall be responsible for the coordination and enforcement of the provisions of this Article.

19-21. Definitions.

For the purposes of this article, the following words and phrases shall have the meanings respectively ascribed to them by this section:

Applicant. A landowner, contract purchaser or other person, partnership, corporation, other legal entity, or agent thereof, or any public agency, which assumes the legal responsibility for development of land, subject to this article and chapter.

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Board. The Montgomery County planning board, of the Maryland-National Capital Park and Planning Commission.

Commission. The Maryland-National Capital Park and Planning Commission.

County. Montgomery County, Maryland.

Council. The Montgomery County council.

Department. The department of environmental protection.

Detention Facility. A storm water management facility that does not have a permanent body of water.

Development. A project consisting of the subdivision of land, or individual parcels, including buildings and other improvements.

Director. The director of the department of environmental protection or a duly authorized agent.

District. The Montgomery Soil Conservation District.

Easement. A grant or reservation by the owner of land for the use of such land by others for a specific purpose or purposes, and which must be included in the conveyance of land affected by such easement.

Erosion. The process by which the ground surface is worn away by the action of wind and/or water.

Executive. The county executive of Montgomery County or a duly authorized agent.

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Extended Detention. The controlled release of storm water over a prescribed period of time.

Functional master plan. A master plan for the conservation and management of a watershed approved by the district council and adopted by the commission.

Impervious. The condition of being impenetrable by water.

Imperviousness. The degree to which a site is impervious.

Maintenance. Any action necessary to preserve storm water management facilities in proper working condition, in order to serve their intended purposes and to prevent structural failure of such facilities.

Off-site storm water management. The design and construction of a facility necessary to control storm water runoff from more than one development.

On-site storm water management. The design and construction of a facility necessary to control storm water runoff within a development.

Preliminary plan. A preliminary plan of subdivision, as provided for by chapter 50 of this Code.

Retention Facility. A storm water facility which has a permanent body of water.

Storm water management. The collection, conveyance, storage, treatment and disposal of storm water runoff in a manner to prevent accelerated channel erosion, increased flood damages and/or reduction of water quality.

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Storm water management plan. A set of representations/drawings or other documents, including development phasing statements, submitted by an applicant and containing the information and specifications as required by the department under regulations adopted under this article and the provisions of this chapter pertaining to storm water management.

Sec. 19-22. Watershed plans.

Pursuant to Article, 28 Annotated Code of Maryland, the county planning board shall prepare for review and approval of the county council, functional master plans for the conservation and management of each watershed in the county. Each functional master plan shall contain, among other things, recommendations for potential locations of off-site storm water management and/or flood control facilities, and indicate the storage capacity required for each segment of the watershed contained in the plan. These plans shall serve as a guide for public policies to protect the watersheds and for the selection and scheduling of specific facilities for inclusion in the capital improvements program.

19-23. Storm water management chapter.

The executive shall cause to be prepared a storm water management chapter, to be included as an integral part of the ten year water supply/sewerage systems plan, for approval by the county council. The chapter shall be guided by the adopted functional master plans, if any, for watershed conservation and management and shall outline county policies and objectives for the development of off-site storm water management and/or flood control facilities during the ensuing ten years. The chapter shall identify potential sites for off-site storm water management facilities and/or flood control facilities needed during the ensuing six year CIP period and thereafter. The chapter shall also address the problems of non-point source contamination of streams and rivers, arising from both inside and outside the Suburban Sanitary District, and shall recommend policies toward attainment of national, state, regional, or county water quality standards or objectives.

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19-24. Off-site storm water management facilities.

The executive is directed annually to recommend design and construction of off-site storm water management facilities as projects in the capital improvement program. Those recommendations shall be guided by the adopted functional master plans, if any, by the adopted ten year water supply and sewerage systems plan, and by the general policies of this article. The executive shall recommend a construction schedule for CIP projects to meet the need to provide adequate protection of the watersheds from the increases in storm water in the basins where contributing development(s) occurs.

19-25. Storm water management required for all development.

No application for preliminary plan of subdivision shall be approved unless it includes a statement, and/or drawing describing, in concept, the manner in which erosion, sediment, water quality impacts and storm water, resulting from the development, will be controlled or managed. This concept plan, which must be approved by the Department, shall indicate whether storm water will be managed on-site or off-site, and, if on-site, the general location and type of management. Those storm water management plans shall be referred for comment to the department and other public agencies, as provided by Sections 50-33A and 50-35 of this Code. No building, grading, or sediment control permit shall be issued by the department for any parcel or lot created prior to, or subsequent to, the effective date of this article, unless a storm water management plan, or waiver thereof, for the plat or parcel, shall have been approved by the director that is consistent with the requirements of this chapter. The provisions of this article do not apply to construction of single-family residences, or their accessory buildings, on lots of two acres, or more, as set forth in state law.

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19-26. On-site requirements; waivers.

Every applicant shall provide for on-site storm water management, unless, upon written request, the director waives this requirement. If a waiver is granted, based on criteria by executive regulation, the department shall require monetary contributions, drainage improvements, the grant of an easement and/or the dedication of land, or a storm water management facility from the applicant, in lieu of the required on-site storm water management.

19-27. Contributions.

(a) Monetary amount.

When an applicant obtains a waiver of the required on-site storm water management, the monetary contribution required shall be in accordance with a fee schedule (unless the developer and the County agree on a greater alternate contribution) established as a part of the rules and regulations promulgated by the county executive, pursuant to Section 19-31 of this article, and based on the cubic feet of storage required for on-site management of the development in question, in accordance with the soil conservation service formula. All of the monetary contributions shall be credited by the County to the appropriate capital improvements program project. The monetary contribution shall not exceed the cost of the otherwise required on-site storm water management facility. The monetary contribution shall be made to the county prior to the issuance of any building permit for the development.

(b) Dedication of land.

In lieu of a monetary contribution, when an applicant obtains a waiver of the required on-site storm water management pursuant to Section 19-26 of this article, the department or the commission (if the site is added to parkland) may enter into an agreement with the applicant for the granting of an easement or the dedication of land by the applicant, to be used for the construction of an off-site storm water management facility. The agreement shall be entered into by the applicant and the department or the commission prior to the recording of plats or, if no record plat is required, prior to the issuance of the building permit.

19-28. County participation in on-site facilities.

When the department determines that additional storage capacity, beyond that required by the applicant for on-site storm water management, is necessary in order to correct an existing problem, or to provide protection in a more desirable fashion for future development, it may acquire from the applicant or owner, by purchase or dedication, additional land as may be necessary, and/or participate financially in construction of a storm water management facility to the extent that it exceeds the required on-site storm water management. Funds for participation in such projects shall be provided in the Capital Improvements Program.

19-29. Inspection and maintenance of off-site storm water management facilities

The Department shall inspect and approve all off-site storm water management facilities for acceptance for County maintenance. Following acceptance, each facility shall be inspected at least twice each year, and shall be maintained by the Department, the Commission, or the Department of Transportation, in good working condition, in order to serve their intended purposes and to prevent structural failure of the facility.

19-30. Inspection and maintenance - on-site facilities.

(a) Inspection and enforcement of maintenance.

Prior to the issuance of any building permit, which has an on-site storm water management facility as one of the requirements of the permit, the department shall require the applicant or owner to execute an easement and an inspection and maintenance agreement binding on all subsequent owners of land served by the on-site storm water management facility. The agreement shall provide for access to the facility at reasonable times, for periodic (yearly) inspection by the county, or their contractor or agent, and for regular or special assessments of property owners to ensure that the facility is maintained in proper working condition to meet design standards and any provisions established

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and required by executive regulation. The easement and agreement shall be recorded by the department in the land records of the county. The agreement shall also provide that if, after reasonable notice by the department to correct a violation of the design standards or the executive regulation, satisfactory corrections are not made by the owner(s), the department may perform all necessary work to place the facility in proper working condition, after proper notice, and assess the owner(s) of the facility for the cost of the work and any penalties, and the cost of the work shall be a lien on the property, or prorated against the beneficial users of the property, and may be placed on the tax bill and collected as ordinary taxes by the county.

(b) Emergency authority.

If, after an inspection by the department, the director determines that the condition of a storm water management facility presents an immediate danger to the public health or safety because of an unsafe condition or improper maintenance, then the director shall take such actions as may be necessary to protect the public and make the facility safe. Any costs incurred by the county as a result of the director's action shall be assessed against the owner(s), as proved in subsection 19-30(a).

(c) Dedication in lieu of agreement.

In lieu of an inspection and maintenance agreement, the director may accept dedication of any existing or future storm water management facility for county maintenance, provided such facility meets all the requirements of this chapter and includes adequate and perpetual access and sufficient area, by easement or otherwise, for inspection and regular maintenance by the county.

19-31. Regulations; interagency agreements.

The Director may recommend written regulations for the administration of the provisions of this Article, and shall hold public hearings as part of this regulation-making process, with opportunity for

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full participation by the Commission. Such regulations, and amendments thereto, shall not conflict with, nor waive, any of the provisions of this Chapter, nor be less restrictive than its provisions, but may exempt development activities which the Director determines do not require regulation under this Chapter, and shall become effective upon their adoption by the County Executive under Method (2) of Section 2A-15 of this Code. Such regulations shall include the establishment of a fee schedule for monetary contributions to the County, in lieu of the required on-site storm water management facility, and may also include design standards and other criteria or procedures necessary to implement the provisions of this Article. The Executive, the District, and the Board shall, within sixty (60) days following the effective date of this Article, execute such agreements as may be necessary to implement its provisions, including the monitoring and review on a periodic basis, of the effect that the program has had on the watersheds of the County. These agreements shall become effective within thirty days of their effective date, unless disapproved by the County Council.

519-32. Performance bond.(*)

(a) Prior to the issuance of any building permit for construction of a development requiring a storm water management facility, the director shall require from the applicant or owner a performance or cash bond, irrevocable letter of credit, certificate of guarantee, or other instrument from a financial institution or issuing organization or entity, in a form satisfactory to him and approved by the county attorney, for the construction of the on-site storm water management facility in an amount equal to the estimated cost of such construction. For the purposes of this article, a certificate of guarantee is an instrument issued by an organization or entity which is approved by the director and meets such capitalization and other reasonable criteria as are established by executive regulation adopted under method (2) of section 2A-15 of this code, including, but not limited to the demonstrated expertise of the issuing organization or its members in stormwater management; and the incidence of violation of, or otherwise

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failing to comply with, the provisions of this chapter by all members of the issuing organization or entity. The certificate of guarantee shall only be issued by the approved organization or entity on behalf of members in good standing of that organization or entity. Any question as to the eligibility of an applicant to post a certificate of guarantee shall be resolved by the director in his sole discretion. The bond, letter of credit, certificate or guarantee, or other instrument shall be conditioned upon the faithful performance of the terms and conditions of the approved storm water management plan and the construction of the facility as set forth in such plan and the provisions of this article. The bond, letter of credit, certificate of guarantee, or other instrument shall inure to the benefit of the county, and to any person aggrieved by the applicant's or owner's failure to comply with the conditions thereof. The bond, letter of credit, certificate of guarantee, or other instrument shall not be fully released by the director until a final inspection has been made by the department and the stormwater management facility has been certified by the department as being in compliance with the approved plan and the provisions of this chapter. In addition, the department may establish by executive regulation, adopted under method (2) of section 2A-15 of this code, a procedure whereby the applicant may enter into an agreement with the county and provide a bond, letter of credit, certificate of guarantee or other instrument equal to the cost of the storm water management facility with the county. The agreement shall set forth the various stages of the work to be done on the facility. Upon completion of each stage, the applicant shall notify the department that he is ready for an inspection and, upon certification by the director of the department that such stage has been completed in accordance with the approved plan and requirements of this chapter, the director of the department may reduce the bond, letter of credit, certificate of guarantee or other instrument pro-rata, or direct the director of finance to refund to the applicant a pro rated share of the amount deposited by the applicant with the county.

* Amended by Bill No. 12-48.

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b) The director shall immediately revoke the permit upon failure of the permittee to maintain such bond or certificate of guarantee. Whenever the director shall find a violation of an applicable law or regulation by an organization or entity issuing certificates of guarantee, he may immediately revoke all permits of members of that organizaton or entity for which a certificate of guarantee has been posted, and may stop work orders wherever applicable until an appropriate bond or other instrument acceptable to the county is substituted for the certificates of a guarantee.

19-33. Agreements between county and municipalities.

The Executive shall inform any incorporated city, town, municipality, or other unit or local government located within the County and possessing powers to regulate storm water management of any proposed storm water management facility, development, or plan which could affect storm water management within its jurisdiction. The Board shall inform any such unit of government of any functional master plan or preliminary plan of subdivision, which may affect storm water management, within its jurisdiction.

The County and the Board may enter into cooperative agreements with any incorporated city, town or other munic pality with the County concerning any matter relating to storm water management, including, but not limited to, the planning, design, construction and maintenance of storm water management facilities and monetary contributions for storm water management. The County and Board may enter into such cooperative agreements in order to coordinate storm water management activities with any unit of local government, to avoid duplication of effort, and to minimize the costs associated with an effective storm water management program.

19-34. Violations, penalties, and other relief.

Any person who violates any provisions of this Article shall be subject to the provisions of Section 19-19 of this Chapter.

19-35. Grandfather clause.

Any applicant or owner of a parcel of land within the County, who has constructed the required on-site storm water management facility, or who is in the process of meeting the storm water management requirements of the law at the time of the effective date of this law, may elect to apply to the Director and/or the Planning Board for reconsideration under the provisions of this Article.

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Montgomery County Government

Executive Regulation

Office of the County Executive
Montgomery County, Maryland

Subject	Number
Stormwater Management	5-90
Originating Department	**Effective Date**
Department of Environmental Protection	August 2, 1990

Montgomery County Regulation on:

STORMWATER MANAGEMENT

DEPARTMENT OF PERMITTING SERVICES

Issued by: County Executive
Regulation No. 5-90

Authority: Code Section 19-31
Supersedes: Executive Regulation No. 37-86
Council Review: Method 2 under Code Section 2A-15
Register Vol. 1, Issue 3
Comment Deadline: April 6, 1990
Effective Date: August 2, 1990
Sunset Date: None

SUMMARY: This executive regulation is the same as Executive Regulation #37-86 with one amendment and the application of plain language standards. This amendment removes Section 4 from Section from Executive Regulation #37-86 in its entirety.

ADDRESSES: Division of Water Resources Management
250 Hungerford Drive, Second Floor
Rockville, Maryland 20850

STAFF CONTACT: Richard Brush, (301) 217-6300

BACKGROUND INFORMATION: The purpose of this regulation is to remove Section 4 from Executive Regulation #37-86. The purpose of this removal is to separate the contribution schedule from the other stormwater management regulations and to facilitate future adjustments to the contribution schedule. There are no other changes made to existing Executive Regulation #37-86.

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OCE/RSH

Resolution No. 11-2122
Introduced: July 3, 1990
Adopted: July 3, 1990

COUNTY COUNCIL
FOR MONTGOMERY COUNTY, MARYLAND

By: County Council

SUBJECT: Executive Regulation 5-90, Stormwater Management

BACKGROUND:

1. On May 4, 1990, the County Executive submitted Executive Regulation 5-90, Stormwater Management.

2. These regulations are submitted for Council review under Method 2, which means that if the Council has not approved them in whole or in part, or extended the review period by July 4, 1990, these regulations are adopted by default.

3. On June 29, 1990, the Transportation and Environment Committee reviewed these regulations and recommended approval.

ACTION

The County Council for Montgomery County, Maryland approved the following resolution:

Executive Regulation 5-90, Stormwater Management, is approved.

This is a correct copy of Council action.

Kathleen A. Freedman, CMC
Secretary of the County Council

Montgomery County Government

Executive Regulation

Office of the County Executive
Montgomery County, Maryland

Subject	Number
Stormwater Management	5-90
Originating Department	**Effective Date**
Department of Environmental Protection	

Section 1. Authority - Definitions

A. Authority:

In accordance with procedures authorized in Chapter 19, entitled "Erosion and Sediment Control and Stormwater Management," Section 19-31, and in Chapter 2, Section 2-105, of the Montgomery County Code 1984, as amended (hereinafter referred to as "the Code"), and in compliance with Sections 8-11A-01 through 8-11A-08, Natural Resources Article, Annotated Code of Maryland, and with COMAR 08.05.05.01 through 08.95.05.10, the following Executive Regulation will pertain to all applications for Preliminary Plan approval, Record Plat approval, building permit issuance for new construction, sediment control/stormwater management plan approval and grading permits, and to performance bond requirements, required maintenance easements and agreements, maintenance of on-site facilities, and stormwater management participation, and appeal procedures.

B. Definitions:

Definitions of the terms used in this regulation are provided in Chapter 19, Section 19-21, of the Code. For the purpose of this regulation, the following additional words and phrases will have the meaning respectively ascribed to them by this regulation:

Best Management Practices or BMPs: Structures or other measures that partially meet the objectives of this regulation but have not been approved as practices meeting State and County stormwater management criteria.

Detention: Storage of runoff in a structure that provides for no permanent pool of water.

Facility: See Stormwater Management Facility.

Flow Rate Control: Prolonging the discharge of runoff to reduce the peak rate of discharge.

Impoundment: A structure created by embankment or excavation or both capable of storing water.

Permanent Pool: A permanent body of water created by an embankment or excavation or both.

Phasing Statement: An agreement by the developer in the form of a letter to the Department of Environmental Protection (DEP) which outlines the planned sequence of development and states the stage of development at which various stormwater management commitments (e.g., design submittal, start of facility construction and implementation of construction) will be made.

Preliminary Stormwater Management Plan: Drawings representing proposed location, contours and vegetation of proposed stormwater management facilities along with supporting hydrologic, hydraulic and storage volume computations.

Retention: Storage of runoff in a facility that provides for a permanent pool of water.

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Office of the County Executive
Montgomery County, Maryland

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Originating Department	**Effective Date**
Department of Environmental Protection	

Small Land Disturbing Activities Permit Application: Application for a sediment control permit for minimum land disturbance of less than 30,000 square feet for residential or 20,000 square feet for other than residential, minimum grading of less than 1,000 cubic yards of excavation and fill, and the establishment of less than 15,000 square feet of impervious surface.

Stormwater Management Concept Plan: A statement or drawing, or both, describing the manner in which storm runoff from the proposed development will be controlled to prevent damage to neighboring properties and receiving streams and to prevent the discharge of pollutants into surface waters.

Stormwater Management Design Plans: Final detailed engineering drawings and specifications for the construction of a stormwater management facility and supporting computations.

Stormwater Management Facility: An infiltration device, vegetative filter, structure, channel, pipe, weir, orifice, or combination of same, designed and constructed to control runoff in a manner to prevent stream channel erosion and pollution of streams resulting from storm runoff.

Water Quality Control: The reduction or elimination of pollution from storm runoff that otherwise would be carried by surface runoff.

Water Quantity Control: The controlled release of runoff flow rate and volume to prevent increased channel erosion.

Section 2. General Administration-Stages of Plan Approval

A. Preliminary Plan Stage:

All applicants for approval of Preliminary Plans of subdivision must provide a stormwater management concept plan which must include an adequate statement or drawing, or both, describing in concept, the manner in which stormwater runoff from the development and one-half adjacent County road rights-of-way will be controlled to prevent damage to neighboring properties and receiving streams, unless previously waived. All stormwater management concept plans must also indicate how all tributary streams and drainage paths within the development will be treated to prevent erosion of drainage courses and flooding (100-year storm) of structures. All plans must indicate by what method water quality requirements will be addressed. When on-site controls are proposed, the plan must indicate the general location and type of the proposed grades of the access route.

The applicant must give notice to the first five downstream property owners on each side of a stream or watercourse or all owners of property within 500 feet downstream, whichever is fewer, for each perennial stream or storm drain outfall from the site. This notice must be sent by mail. The notice must be made within ten calendar days after submission of a preliminary plan application to the Board. The applicant must certify to DEP, within twenty calendar days after submission of a preliminary plan application, that

such notice has been made. Certification to DEP must include a list of property owners notified and a copy of the notice.

The notice to downstream property owners must include the following:

- o A statement that an application for preliminary plan has been submitted to the Board and the the preliminary plan includes a stormwater management concept plan.
- o The preliminary plan application reference number.
- o Reference to this regulation as the authority regulating review and approval of stormwater management concept plans.
- o A copy of the preliminary plan including the stormwater management concept plan.
- o A statement that DEP has the authority to approve the stormwater management concept plan and that comments concerning such plan must be addressed to DEP in writing within two weeks after receipt of the notice.
- o Comments received from property owners will be considered in the review and approval of the stormwater management concept plan.

In addition, whenever a stormwater management facility is to be located on property or land owned by or to be dedicated to the Commission, the approval of the Department of Parks will be required.

1. Stormwater Management Concept Plan:

a. Priority

In developing the stormwater management concept plan, stormwater management practices to be utilized must be considered in the following order of preference:

1. infiltration of runoff;
2. flow attenuation by use of open vegetated swales and natural depressions;
3. retention facilities; and
4. detention facilities.

b. Documentation of Priority Selection

Documentation for determining feasibility for infiltration must be made by identifying soils on the site (reference - Soil Survey, Montgomery County, Maryland, Series 1958, published by U.S. Soil Conservation Service, or most recent update) and by the feasibility tests found in the "Standards and Specifications, Infiltration Practices," published by Maryland Water Resources Administration (WRA), 1984. A list of county soils and their limitations for infiltration will be included in the Montgomery County Stormwater Management Design Manual.

Use of open vegetated swales as roadside ditches in lieu of curbs and gutters must be in accordance with requirements established by the Montgomery County Department of Transportation and site plan requirements as directed by the Board.

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When infiltration and flow attenuation are proven infeasible, retention facilities must be used, except in cases where it can be demonstrated that significant public safety, economic, engineering, or environmental hardships would result from such use.

The approval of the Director is required for use of detention in lieu of retention facilities. As a guide, retention facilities generally must have a ratio of drainage area to surface area of at least 40:1, with a minimum 10 acre drainage area and a minimum water surface area of 1/4 acre.

2. Waivers

A waiver of on-site stormwater management requirements may be granted by the Director for individual developments, in accordance with Section 2.A.2.a through 2.A.2.f of this regulation, provided that a written request is submitted to DEP by the applicant containing descriptions, drawings, and any other information that is necessary to evaluate the proposed development. This waiver request must address both the two-year storm control requirements and the water quality requirements of Section 4.B.3.b of this regulation. The granting of a waiver of one type of control feature (e.g., flow-year control) will not release the applicant from the obligation of the other type of control (e.g., water quality).

The cumulative effect of all waivers in a watershed must be evaluated when it is determined appropriate by the Director.

Water quality waivers may be granted subject to providing specific best management practices including both on-site and off-site improvements. When this is done, an equivalent area and land use must be controlled in a regional or other stormwater management facility and, where feasible, in the same watershed. Where a development is waived of water quality requirements, it must provide appropriate best management practices approved by DEP.

A separate written waiver request is required, in accordance with the provisions of this section, when there are subsequent additions, extensions, or modifications to a development receiving a waiver.

To obtain a waiver, the applicant must demonstrate that:

a. the hydraulic characteristics of the receiving stream and the watershed, and the water quality and environmental characteristics of the stream and the site, are such that on-site management (infiltration, retention, detention) is contrary to obtaining the objective of stream channel erosion prevention and water quality protection; or

b. an off-site stormwater management facility has been either constructed, programmed, or identified for construction in the capital improvements program, an adequate conveyance system to the facility will be provided, and the off-site facility will incorporate the controls for which a waiver is requested. However, when a development proceeds before the off-site facility is constructed and it is determined by DEP that damages would occur

to the stream, DEP may require the installation and maintenance of temporary on-site facilities until the off-site facility is operational; or

c. the proposed development will not generate more than a 10 percent increase in the two-year pre-development, peak discharge rate and will not cause an adverse impact on the receiving watercourse or waterbody; or

d. the site is surrounded by existing developed areas which are served by an existing network of improved storm drainage systems of adequate capacity to accommodate the runoff from the additional development. However, when a waiver of water quality control is granted, best management practices may be required for parking lots or other impervious surfaces; or

e. the site falls under one of the standard stormwater management contribution categories listed below. These are developments for which a stormwater management contribution rather than the requirements for a stormwater management facility controlling the two-year storm and water quality will normally be required. However, best management practices may be required for parking lots or other impervious surfaces. The standard contribution categories are as follows:

(1) subdivisions of detached single-family residential developments:

Minimum Lot Size	Maximum Subdivision Size
1 acre	10 acres
1/2 acre	5 acres
15,000 square feet	2 acres
9,000 square feet	2 acres
6,000 square feet	2 acres

(2) subdivisions of multi-family residential developments: subdivisions developments which total 2 acres or less.

(3) institutional/recreational developments: developments in which there are 2 acres or less of disturbed area and, included therein, 1/2 acre or less of impervious area.

(4) industrial and commercial developments: developments in which the total disturbed area is 30,000 square feet or less and, included therein, 15,000 square feet or less of impervious area.

Any new projects which are additions, extensions and/or modifications to those developments listed in the above categories which previously have not been required to build a stormwater management facility may be required to provide stormwater management for the entire site when the acreage limitations listed for each are exceeded by the subsequent addition, extension and/or modification thereto; or

f. all conforming residential developments which use the "small land disturbing activities permit application" are not required to provide

stormwater management, but are required to pay an appropriate stormwater management contribution.

3. Requests for Waivers

All waiver requests must be submitted to DEP in two copies. Such waiver requests must include supporting documentation as required by DEP in sufficient detail to provide for evaluation of the impacts upon receiving drainage systems and streams.

Upon receipt of a complete waiver request, a copy will be forwarded by DEP to the Board staff for review and comment prior to action by DEP. Written comments from the Board staff will be considered by DEP and will become part of the permanent waiver request file.

Incomplete waiver reqests will be returned to the applicant with a listing of the required additional supporting documentation.

4. Exemptions

a. The following development activities are exempt from the provisions of this regulation:

(1) agricultural land management activities;

(2) additions or modifications to existing single-family detached residential structures;

(3) land development activities which the Water Resources Administration determines will be regulated under specific State laws which provide for managing stormwater runoff; or

(4) residential developments consisting of single-family structures each on a lot of two acres or greater.

b. Developments that do not disturb over 5,000 square feet of land area are exempt from providing on-site stormwater management; however, such developments may be subject to a stormwater management contribution. Such contributions will be determined on a case-by-case basis by DEP.

B. Record Plat Stage

Prior to the recordation of a plat of subdivision, the method by which the stormwater management requirements are to be satisfied must have been approved by DEP as meeting the provisions of Chapter 19 and this regulation. Where stormwater management is required, the Director may require the following to be documented in support of each plat:

1. location of the facility;
2. location of the easement for the facility;
3. location and profile of the access easement for inspection and maintenance of the facility;
4. method by which the stormwater management obligation is to be met for both water quantity and water quality controls; and/or
5. notice and definition of the maintenance responsibility for stormwater management facilities.

Montgomery County Government

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Office of the County Executive
Montgomery County, Maryland

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C. Site Plan Stage

For developments for which site plan review is required by the Zoning Ordinance, the site plan submission must include a preliminary stormwater management plan which includes the same documentation as a concept plan plus the specific location, approximate contours and proposed vegetation, both terrestrial and aquatic, for the proposed stormwater management facility along with supporting hydrologic, hydraulic and storage volume computations. All water quality features for the development must also be shown on the site plan. The location of stormwater mangement easements must also be indicated. This information must be submitted through the Board to DEP for review and approval of the preliminary stormwater management plan. These requirements also apply to site plan revisions. Final design approval of proposed stormwater managment facilities will not be made prior to Board action on the site plan.

D. Sediment Control/Stormwater Management Plan Stage

Stormwater management plans must be approved for meeting design requirements and for compliance with the provisions of Chapter 19, Section 19-30, and this regulation, by DEP. As part of the submission for approval of sediment control plans, stormwater management must be addressed in one of the following ways:

1. Where a building permit will be required:

a. the applicant must provide design plans for stormwater management in accordance with the concepts approved as conditions of the approved preliminary plan. The applicant must also provide stormwater management easements and a maintenance agreement as conditions of approval of the stormwater management plans by DEP; or

b. the applicant must provide an approved stormwater management concept and development phasing statement; or

c. where the requirements of on-site stormwater management have been waived, the applicant must provide to DEP for approval a statement as to how the stormwater management commitment will be met (e.g., by monetary contribution, BMPs grant of an easement, dedication of land or stormwater management facility). This includes all conforming residential developments which use the "small land disturbing activities permit application."

2. Where no building permit will be required:

In cases such as parking surfaces or other impervious surfaces, an approved stormwater management plan, or a waiver thereof, is required. Where a waiver is granted, a contribution will be required prior to issuance of a sediment control permit.

In the case of public road projects, the appropriate agency must coordinate its planning and design activities with DEP in developing potential regional stormwater management facilities and a letter of concurrence must be

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obtained from DEP for each project. Each road project must include stormwater management controls for both flow rate and water quality unless waived by DEP.

E. Building Permit Stage

1. New Construction

Prior to the issuance of any building permit for all new construction (including redevelopment) on any parcel or lot, the following must be submitted to DEP:

a. an approved stormwater management plan along with appropriate maintenance easements and covenants, and, where on park property, evidence of design approval and acceptance of maintenance responsibility by the Department of Parks; or

b. where runoff is to be controlled in another private facility, documentation, approved by DEP, of a private arrangement for off-site runoff storage, adequacy of conveyance and storage facilities and of acceptance of uncontrolled runoff by the owner of the runoff conveyance system and the runoff control facility, and where applicable, a recorded stormwater management easement and maintenance covenant for the facility; or

c. where applicable, an approved development phasing statement; or

d. where applicable, evidence of a waiver of on-site stormwater management.

2. Additions

Prior to the issuance of any building permit for all additions for other than an individual single-family dwelling, the following must be on file with DEP:

a. an approved stormwater management plan, and, where appropriate, a stormwater management easement and a stormwater management maintenance agreement; or

b. evidence of a waiver of on-site stormwater management.

Where a waiver of on-site stormwater management has been granted for the lot or parcel for which a building permit has been applied, the applicant must provide the appropriate contribution as determined by DEP.

Nothing in this section may be construed to mean that the stormwater management requirements cannot be satisified by a combination of on-site and off-site facilities, if so approved by DEP.

Section 3. Performance Bond

The Stormwater Management Performance Bond as required in Section 19-32, Chapter 19, of the Code, may be combined with the Sediment Control Bond, and the Director may grant partial or a complete waiver of such Bond in accordance with Section 19-10 of the same chapter.

Upon completion of the stormwater management facility, the applicant must notify DEP and, if on Park property or land to be dedicated to Parks, the

Parks Department of such completion. Upon certification by DEP, and, when appropriate, by the Parks Department that the facility has been satisfactorily completed, that portion of the performance bond or letter of credit for Stormwater Management will be released.

Section 4. Criteria for Design and Construction Plans

All stormwater management and development plans must be consistent with adopted and approved watershed management plans or flood management plans as approved by the WRA, in accordance with the Flood Hazard Management Act of 1976, Section 8-9A-01 et.seq., Natural Resources Article, Annotated Code of Maryland.

A. Approvals of Design and Construction Plans

The approval of DEP is required for all stormwater management design and construction plans.

Natural Resources Article, Section 8-803, Annotated Code of Maryland, requires the approval of all impoundments designs for dam safety by either the Montgomery Soil Conservation District or the Maryland Water Resources Administration.

Approval of the Parks Department will be required whenever a stormwater management facility is to be located on property or land owned by or to be dedicated to the Commission.

When community water or sewer facilities are located or planned within the limits of proposed stormwater management facilities, the approval of the Washington Suburban Sanitary Commission (WSSC) is required.

B. Specific Design Criteria

1. Infiltration systems are to be designed in accordance with "Standards and Specifications - Infiltration Practices" developed by the Water Resources Administration, and must meet the following requirements:

a. infiltration systems greater than 3 feet deep must be located at least 10 feet from any basement wall, and designed so as to prevent saturation in the areas of existing or proposed building foundations, roads and parking lots and any other structure that might be vulnerable to damages from soil saturation and/or hydrostatic loading;

b. infiltration systems designed to handle runoff from commercial or industrial impervious areas must be a minimum of 100 feet from any water supply well;

c. infiltration systems must not receive runoff until the entire tributary drainage area to the infiltration system has received final stabilization; and

d. the infiltration facility design must provide an overflow system with measures to provide a non-erosive velocity of flow along its length and at the outfall.

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2. Retention and detention impoundments must be designed and constructed in accordance with criteria of the Soil Conservation Service, the Montgomery County Stormwater Management Design Manual and must include the following items:

a. velocity dissipation devices must be placed at the outfall of all detention or retention structures and along the length of any outfall channel as necessary to provide a non-erosive velocity of flow from the structure to a water course;

b. DEP may require the developer to submit to DEP an analysis of the water quantity and water quality impacts of stormwater flows downstream in the watershed. The analysis must include hydrologic and hydraulic calculations necessary to determine the impact of hydrograph timing modifications of the proposed development upon a dam, highway, structure, or natural point of restricted stream flow, established with the concurrence of DEP, downstream of a tributary area of the following size:

(1) the first downstream tributary area which equals or exceeds the contributing area to the stormwater management facility; or

(2) the first downstream tributary area of which the peak two-year storm discharge exceeds the designed two-year release rate of the stormwater management facility.

c. the designed release rate of the structure must be modified if any increase in flood damages or stream channel erosion would result at the downstream dam, highway, structure, or natural point of restricted streamflow or if downstream water quality would be impacted unacceptably. The release rate of the structure must:

(1) be reduced to a level that will prevent any increase in flood damages or stream channel erosion at the downstream control point;

(2) be not less than one-year pre-development peak discharge rate except that extended detention storage volumes will be discharged at a rate to release such storage within 40 hours;

(3) be reduced to a level to allow adequate detention time to assure adequate water quality protection.

3. All stormwater management facilities must meet the following requirements:

a. have a tributary drainage area not in excess of 400 acres unless, on a case-by-case basis, a larger drainage area is approved by the WRA; and

b. for water quality 1) manage the one-inch rainfall event according to the infiltration standards and specifications promulgated by WRA, 2) provide for a permanent pool equal to or greater than 1/2 inch of runoff from the drainage area, or 3) provide for 24-hour detention and release of the total volume of runoff resulting from a one-year storm for central facilities, or the total volume of runoff from a one-inch rainfall for on-site facilities.

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However, DEP may require special water quality controls in Class III and IV, and water supply watersheds; and

c. must manage the increase in peak discharge for the two-year frequency storm event; and

d. not be located so as to discharge to Class III Natural Trout Waters identified in COMAR 10.50.01.02I, unless authorized by the WRA in permits issued pursuant to Natural Resources Article, Section 8-803.

4. The pre-development peak discharge rate will be computed assuming that all land uses in the tributary area are meadow in good hydrologic condition or more pervious existing conditions.

5. The developer must give consideration to incorporating the use of natural topography and land cover such as wetlands, ponds, natural swales, and depressions as they exist prior to development to the degree that they can accommodate the additional flow of water.

6. The developer must prepare and submit to DEP for approval a best management practices plan when water quality requirements have not been adequately met or have been waived.

7. Where a stormwater management plan involves direct discharge of runoff onto an adjacent site, and construction of an outfall, it is the responsibility of the developer to obtain from the adjacent property owner an easement.

8. All storm drainage systems which convey off-site storm water through a site must be public storm drainage systems or private storm drainage systems which are designed, constructed and maintained to at least the standards of public storm drainage systems. The design and construction must be certified by a professional engineer as meeting or exceeding public drainage systems standards. Private storm drainage systems must be made accessible to the upstream property owner by executing an easement approved by DEP. The owner of the private storm drainage system must execute a maintenance covenant approved by DEP for that portion of the private storm drainage system which conveys off-site stormwater.

9. The basic design criteria, methodologies, and construction specifications, subject to the approval of DEP and the WRA, generally are those of the Soil Conservation Services (SCS) and are found in the most current edition of the following publications:

a. SCS Maryland Standards and Specifications for Ponds, Practice Code 378;

b. SCS National Engineering Handbook, Sections 4 and 5;

c. SCS Engineering Field Manual;

d. SCS Technical Release #55, Urban Hydrology for Small Watersheds;

e. Stormwater Management Pond Design and Construction Manual, published by the Maryland Association of Soil Conservation Districts; and

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f. Montgomery County Stormwater Management Design Manual.

Computations for stormwater management storage must include one-half of contiguous rights-of-way of existing and planned non-state roads, and must include new construction within state rights-of-way.

The latest approved SCS criteria for the design of stormwater management impoundment structures will be accepted. Other design criteria may be used only when approved by the WRA, the Director of DEP, and the District, prior to submission for review.

C. Certifications and Plan Requirements

1. The developer must certify that all land clearing, construction, development and drainage will be done according to the approved stormwater management design plan.

2. A sequence of construction and construction phasing is required on all stormwater management design plans.

3. Construction specifications approved by DEP are required on all stormwater management design plans.

4. All underground stormwater management facility designs must be certified on the design plan as being structurally sound. A building permit is required for construction of all underground facilities.

5. All stormwater management designs must be certified as meeting the requirements of this regulation and must be sealed by a professional engineer registered in the State of Maryland.

Section 5. Construction and Inspection

All construction of stormwater management facilities must meet the design criteria as stated in Section 4 of this regulation and the approved construction plans for the specific facility.

A pre-construction meeting is required prior to commencing any stormwater management facility construction.

Inspection during construction is required regularly by County staff, and at the discretion of DEP, by registered professional engineers or private inspectors under the authority of a professional engineer. DEP must be notified prior to each of the required inspection points.

Inspection of stormwater management facilities located on Park property must be jointly inspected with a Park inspector.

Record (as-built) drawings of all stormwater management facilities will be required and certified by the developer's engineer as meeting the water quantity and water quality requirements of this regulation, prior to the release of a performance bond.

A. Impoundments

The applicant must notify DEP at least twenty-four (24) hours in advance

to schedule a construction inspection at each of the following stages of construction of stormwater management impoundment facilities:

1. upon installation of sediment control measures and temporary waterway diversion;
2. excavation to sub-foundation and when required, installation of structural supports or reinforcement for structures, including but not limited to:
   a. core trenches for structural embankments,
   b. inlet-outlet structures, anti-seep structures, and watertight connectors on pipes, and
   c. trenches for enclosed storm drainage facilities;
3. during placement of structural fill, concrete and installation of piping and catch basins;
4. during backfill of foundations and trenches;
5. during embankment construction; and
6. upon completion of final grading and establishment of permanent stabilization.

In addition to the above requirements for notification, and when failure of the facility could cause loss of life or serious property damage, or when DEP determines that specific site conditions warrant, DEP may require the applicant to provide engineering inspection and testing during construction and when complete, certification by a professional engineer that all work completed and construction materials used meet or exceed requirements according to approved plans and specifications.

The "Stormwater Management Pond Design and Construction Manual" is the adopted reference for the design and construction of stormwater management facilities.

B. Infiltration Systems

The applicant must notify DEP to schedule a construction inspection at least twenty-four (24) hours in advance of:

1. commencing construction;
2. backfilling of infiltration trench;
3. installation of drainage facilities;
4. installation of final cover; and
5. allowing runoff to enter the system.

C. Porous Pavement

All porous pavement infiltration systems must be inspected at the following stages. The applicant must notify DEP to schedule a construction inspection at least twenty-four (24) hours in advance of commencing the following stages to provide for inspection during critical stages of construction:

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1. upon completion of stripping, stockpiling, construction of temporary sediment control and drainage facilities;
2. upon completion of subgrade section;
3. upon completion of reservoir base course;
4. upon completion of the top crushed stone course; and
5. throughout the placement of the porous asphaltic concrete surface course to ensure proper laying temperatures and compaction.

D. Flow Attenuation Devices

All flow attenuation devices must be inspected upon completion.

E. Others

All BMPs must be inspected during construction and upon completion.

Section 6. Maintenance

All stormwater management structures must be maintained in proper working condition by the owner of the facility. If, after due notice, a facility is not properly maintained, the County may perform the necessary maintenance and assess the cost to the owner as described in Chapter 19, Section 19-30, of the Code.

The developer may request the County, through the Director to accept any on-site stormwater management facility for County maintenance as provided in Chapter 19, Section 19-30(c), of the Code. The Director may accept those facilities for County maintenance, on a case-by-case basis where the Director determines it would be in the best interest of the County to maintain such facility and that public funds are available to perform such maintenance. Acceptance of such facility satisfactory to the Director is conditioned upon the applicant providing evidence that the facility meets the criteria of Section 4 of this regulation. The applicant must also provide evidence of recorded easements. All such arrangements agreed to by the applicant and the Director must be documented by Agreement and recorded in the Land Records.

Section 7. Stormwater Management Participation

It is the intent of DEP to develop a system of regional stormwater management facilities throughout the County that conform to the County's watershed plans and maximize the economic benefit of regional facilities.

When a participation agreement has been made by the applicant and the County to provide a centralized stormwater management facility, the applicant must comply with DEP's Stormwater Management Participation Policy.

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Section 8. Appeal Procedure

Where a waiver of either water quantity or water quality or both is granted (or denied) by DEP, or a stormwater management facility is required, the applicant, Board, or any aggrieved party, may appeal the decision. Such appeal must contain specific data and information that clearly substantiates that the waiver was granted, or denied, or a facility was required, in conflict with the provisions of this regulation. All appeals must be submitted to the Director within thirty (30) days of either the granting or denial of the waiver or the Board hearing date for the preliminary plan, whichever is later. The Director's decision is final.

Section 9. Effective Date

This regulation takes effect 30 days after the date of adoption by the County Council.

Sidney Kramer
Sidney Kramer
County Executive

0466K

APPROVED AS TO FORM AND LEGALITY.
OFFICE OF COUNTY ATTORNEY
BY A. K. Hart
DATE 2/16/90

R0070581

ARTICLE XIII. ENVIRONMENTAL MANAGEMENT

Sec. 13-100 General findings.

The Chesapeake Bay is one of the most productive estuaries in the world, providing substantial economic and social benefits to the people of the Commonwealth of Virginia. Healthy state and local economies are integrally related to and dependent upon the health of the Chesapeake Bay. The general welfare of the people of the Commonwealth depends upon the health of the Bay.

The waters of the Chesapeake Bay and its tributaries have been degraded significantly by point source and nonpoint source pollution, which threatens public health and safety and the general welfare.

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Sec. 13-100 General findings.

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Appropriate land use regulations and construction and maintenance practices have proven ability to reduce pollution that damages water quality of the Chesapeake Bay and its tributaries.

13-101 Purpose.

(A) It is the policy of the City of Alexandria, Virginia to protect the quality of water in the Chesapeake Bay and its tributaries and, to that end, to require all land uses and land development in the city to:

(1) Safeguard the clean waters of the Commonwealth from pollution;

(2) Prevent any increase in pollution of state waters;

(3) Reduce existing pollution of state waters;

(4) Promote water resource conservation.

(B) To fulfill this policy, these regulations are adopted to minimize potential pollution from stormwater runoff, minimize potential erosion and sedimentation, reduce the introduction of harmful nutrients and toxins into state waters, maximize rainwater infiltration while protecting groundwater, and ensure the long-term performance of the measures employed to accomplish the statutory purpose.

13-102 Authority. These regulations are issued under the authority of Sec. 10.1-2108 of Chapter 21, Title 10.1 of the Code of Virginia (the Chesapeake Bay Preservation Act, hereinafter "the Act"), the regulations promulgated thereunder by the Chesapeake Bay Local Assistance Board, and section 10.1-603.3 of the Code of Virginia, which authorizes the city to adopt a local storm water management program. Authority to protect water quality is also provided by section 15.1-489 of the Code of Virginia.

13-103 Definitions. The following words and terms used in this Article XIII have the following meanings, unless the context clearly indicates otherwise.

(A) *Best management practice (BMP).* A practice, or combination of practices, that is determined by the director of transportation and environmental services to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with the water quality goals of these regulations; examples include stormwater retention ponds, infiltration trenches and filtration systems.

(B) *Buffer area.* An area of natural or established vegetation managed to protect other components of a resource protection area and state waters from significant degradation due to land disturbances.

(C) *Development.* The construction or substantial alteration of residential, commercial, industrial, institutional, recreational, transportation or utility facilities or structures.

(D) *Floodway.* All lands as defined in section 6-303(K) of this ordinance.

(E) *Highly erodible soils.* Soils (excluding vegetation) with an erodibility index (EI) from sheet and rill erosion equal to or greater than eight. The erodibility index for any soil is defined as the product of the

formula RKLS/T, as defined by the "Food Security Act (F.S.A.) Manual" of August 1988, in the "Field Office Technical Guide" of the U.S. Department of Agriculture Soil Conservation Service; where K is the soil susceptibility to water erosion in the surface layer; R is the rainfall and runoff; LS is the combined effects of slope length and steepness; and T is the soil loss tolerance.

(F) *Highly permeable soils.* Soils with a given potential to transmit water through the soil profile. Highly permeable soils are identified as any soil having a permeability equal to or greater than six inches of water movement per hour in any part of the soil profile to a depth of 72 inches (permeability groups "rapid" and "very rapid"), as found in the "National Soils Handbook" of July 1983 in the "Field Office Technical Guide" of the U.S. Dept. of Agriculture Soil Conversation Service.

(G) *Impervious cover.* A surface composed of any material that significantly impedes or prevents natural infiltration of water into the soil. Impervious surfaces include, but are not limited to: roofs, buildings, streets, parking areas, and any concrete, asphalt, or compacted gravel surface.

(H) *[Reserved.].*

(I) *Land disturbance.* Any land change which may result in soil erosion from water or wind and the movement of sediments into state waters or onto lands in the Commonwealth, including, but not limited to, clearing, grading, excavating, transporting and filling of land.

(J) *Nonpoint source pollution.* Contamination from diffuse sources that is not regulated as point source pollution under Section 402 of the Clean Water Act.

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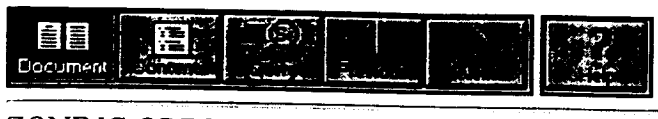

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13-103 Definitions. The following words and terms used in this Article XIII have the following meanings, unless the context clearly indicates otherwise.

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(K) *Nontidal wetlands.* Those wetlands, other than tidal wetlands, that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions, as defined by the U.S. Environmental Protection Agency pursuant to Section 404 of the Federal Clean Water Act, in 33 CFR 328.3b, dated November 13, 1986.

(L) *Pre-development.* The land use that exists at the time that plans for the development are submitted to the city. Where phased development or plan approval occurs (preliminary grading, roads and utilities, etc.), the existing land use at the time the first item is submitted shall establish pre-development conditions.

(M) *Post-development.* Conditions that reasonably may be expected or anticipated to exist after completion of the development activity on a specific site or tract of land.

(N) *Redevelopment.* The process of developing land that is or has been previously developed.

(O) *Runoff or stormwater runoff.* That portion of precipitation that is discharged across the land surfaces or through conveyances to one or more waterways.

(P) *State waters.* All waters on the surface or in the ground, wholly or partially within or bordering the Commonwealth or within its jurisdiction.

(Q) *Stormwater management facility.* A device that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release or the velocity of flow.

(R) *Tidal shore or shore.* Land contiguous to a tidal body of water between the mean low water level and the mean high water level.

(S) *Tidal wetlands.* Vegetated and nonvegetated wetlands as defined in section 62.1-13.2 of the Code of Virginia.

(T) *Tributary stream.* Any perennial stream that is so depicted on the most recent U.S. Geological Survey 7-1/2 minute topographic quadrangle map (scale 1:24,000).

(U) *Use.* Any activity on the land other than development, including, but not limited to agriculture, horticulture and silviculture.

(V) *Water-dependent facility.* A development of land that cannot exist outside of the Resource Protection Area and must be located on the shoreline by reason of the intrinsic nature of its operation. These facilities include, but are not limited to: (i) ports; (ii) the intake and outfall structures of power plants, water treatment plants, sewage treatment plants, and storm sewers; (iii) marinas and other boat docking facilities; (iv) beaches and other public water-oriented recreation areas, and (v) fisheries or other marine resources facilities.

(W) *Water quality volume.* The volume equal to the first 0.5 inch of runoff multiplied by the total impervious area of the development site.

(X) *Watershed.* The total drainage area contributing runoff to a single point.

(Y) *Wetlands.* Tidal and nontidal wetlands.

13-104 Administration of article.

(A) *Responsibility.* The director of transportation and environmental services is charged with the responsibility for the administration of this Article XIII.

(B) *Duties and authority.* In the administration of this Article XIII the duties and authority of the director of transportation and environmental services shall include, without limitation:

(1) Receiving applications for plan of development approval;

(2) Reviewing applications to determine if they contain all information required and necessary for a determination of their merit;
(3)\Reviewing applications to determine their compliance with the provisions and intent of this Article XIII and their merit;

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(4) Docketing items for hearing before the planning commission and conferring with the city manager to schedule public hearings before the city council as necessary on applications;

(5) Preparing a staff report for each application;

(6) Interpreting the provisions of this Article XIII to ensure that its intent is carried out.

(C) *Rules, regulations and procedures.* The director of transportation and environmental services shall promulgate rules, regulations and procedures for the administration and enforcement of this Article XIII and shall promulgate rules, regulations and procedures for the processing of applications that ensure full review, comment and recommendations on each application by the department of transportation and environmental services. The city manager shall promulgate rules and procedures for review by other departments of applications, where such review is determined to be necessary or desirable and such procedures may include the establishment of a development review committee composed of departments of the city whose expertise is necessary or desirable in the review of applications. All such rules, regulations and procedures shall be transmitted to the city council at the time of issuance.

(D) *Establishment of fees.* The director of transportation and environmental services shall by general rule approved by city council establish a schedule of fees required for each application under this Article XIII to be paid at the time an application is submitted.

(E) *Responsibility for enforcement.* The director of transportation and environmental services shall have the authority and the responsibility of section 11-200 of this ordinance to ensure that all buildings and structures and the use of all land complies with the provisions of this Article XIII.

(F) The director of transportation and environmental services shall review, approve, disapprove, or approve with modifications or conditions or both the following elements of the plan of development:

(1) The environmental site assessment, required pursuant to section 13-116.

(2) The stormwater management plan, required pursuant to section 13-117.

(3) The water quality impact assessment, if required pursuant to section 13-118.

(4) Compliance of the plan of development with sections 13-109 through 13-113.

(G) Review and decision on the remaining elements of the plan of development shall be as provided in the regulations of this ordinance and the city code applicable to each such element.

(H) Review and decision on applications for exceptions shall be as provided in section 13-120.

(I) Review and decision on applications for exemptions shall be as provided in section 13-123.

13-105 Designation of Chesapeake Bay Preservation Area Overlay District.

(A) All land within the corporate limits of the city is designated as a Chesapeake Bay Preservation Area

(CBPA). The CBPA is divided into resource protection areas and resource management areas. The regulations set forth in this Article XIII shall apply as an overlay district, and shall supersede any zoning, land use or land development regulation of the city code which is inconsistent with the provisions of this Article XIII.

(B) Resource Protection Areas (RPAs) consist of sensitive land adjacent to or near the shoreline that has either an intrinsic water quality value due to the ecological and biological processes such land performs or that is sensitive to uses or activities such that the use results in significant degradation to the quality of state waters. In their natural condition, these lands provide for the removal, reduction, or assimilation of nonpoint source pollution entering the bay and its tributaries. An area of land that includes any one of the following land types shall be considered to be within a RPA:

(1) Tidal wetlands;

(2) Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams;

(3) Tidal shores;

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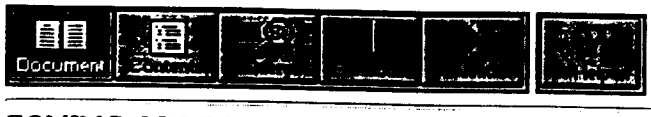

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(4) Tributary streambeds, not owned by the Commonwealth of Virginia; and

(5) Buffer areas 100 feet in width located adjacent to and landward of the components listed in paragraphs (1) through (4) above, and along both sides of any tributary stream. Specific exceptions and standards for buffer requirements are set forth in sections 13-109 and 13-111.

(C) Resource Management Areas (RMAs) include land that, if improperly used or developed, has a potential for causing significant water quality degradation or for diminishing the functional value of a RPA. Therefore, all lands in the city, not included in a RPA, shall constitute a RMA since all such land drains through natural (*e.g.,* streams) or manmade (*e.g.,* stormwater sewers) channels to the Potomac River.

13-106 Incorporation of CBPA map.

(A) The CBPA map, dated January 28, 1992, and signed by the Mayor and director of transportation and environmental services, prepared in accordance with the above designation criteria which define the boundaries of RPAs and RMAs is hereby incorporated by reference into this ordinance.*

***Editor's note**--It should be noted that Ord. No. 3610, § 4, amended the CBPA map. Said amendments are not set out herein, but are on file and available for inspection in the offices of the city.

(B) The boundaries of RPAs and RMAs are drawn on the map based on the rebuttable presumption that the lands within those boundaries meet the respective RPA and RMA designation criteria. In the event of conflict between the CBPA map and the designation criteria in section 13-105, the designation criteria shall be controlling. The director of transportation and environmental services may exercise judgment in determining site-specific boundaries based on more reliable field data provided by the applicant or staff and examined during the plan of development review process.

13-107 Development and uses permitted in RPAs.

(A) Development is permitted in RPAs only if it is water dependent and is permitted in the underlying zone. Redevelopment is permitted in RPAs if it is permitted in the underlying zone. Development and redevelopment shall comply with all requirements in sections 13-109, 13-110 and 13-111.

(B) In addition to the development or redevelopment permitted in section 13-107(A) above, the following uses only shall be permitted within a RPA to the extent that they are not prohibited by any other provision of the city code or applicable law and provided they do not require development, redevelopment, structures, grading, fill, draining, or dredging:

(1) Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife;

(2) Passive recreational activities, including but not limited to fishing, birdwatching, hiking, boating,

horseback riding, swimming, and canoeing;

(3) Educational activities, scientific research, and nature trails; and

(4) Historic preservation and archeological activities.

(C) The following uses, which may involve structures, fill, flooding, draining, dredging, or excavating, shall be permitted within a RPA, to the extent specifically enumerated in these regulations and not prohibited by any other provision of the city code or applicable law and subject to the director of transportation and environmental services review and approval of design and construction plans for compliance with this Article XIII:

(1) Construction, installation, operation and maintenance of electric, gas, and telephone lines, railroads and public roads constructed by VDOT or by or for the City of Alexandria in accordance with VDOT standards, and their appurtenant structures, in accordance with regulations promulgated pursuant to the Erosion and Sediment Control Law (sections 10.1-560 *et seq.* of the Code of Virginia and the Stormwater Management Act (sections 10.1-603.1 *et seq.* of the Code of Virginia); an erosion and sediment control plan and a stormwater management plan approved by the Department of Conservation and Recreation or by the City of Alexandria under local water quality protection criteria at least as stringent as the above state requirements shall be deemed to constitute compliance with these regulations;

(2) Construction, installation, and maintenance of water, storm or sanitary sewer, and local gas or other utility lines provided that:

(a) To the degree possible, the location of such utilities and facilities should be outside RPAs;

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13-107 Development and uses permitted in RPAs.

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(b) No more land shall be disturbed than is necessary to provide for the desired utility installation;

(c) All such construction, installation, and maintenance of such utilities and facilities shall be in compliance with all applicable state and federal permits, and designed and conducted in a manner that protects water quality;

(d) Any land disturbance exceeding an area of 2500 square feet shall comply with the Erosion and Sediment Control regulations in the city code.

(3) Limited excavating and filling in an area of 2500 or less square feet necessary for the repair and maintenance of piers, walkways, observation decks, duck blinds, wildlife management shelters, boathouses, and other similar water-related structures, provided that they are built on pilings to allow unobstructed flow of water and preserve the natural contour of a RPA.

(4) Paved or unpaved bike or other recreational trails.

(5) Required construction, installation, minor modification and maintenance of in-stream or regional best management practices.

13-108 Development and uses permitted in RMAs. Development, redevelopment and uses authorized by the underlying zone are permitted in the RMA provided such activity is carried out in accordance with the performance requirements set forth in sections 13-112 and 13-113.

13-109 General performance requirements for development and redevelopment in RPAs.

(A) The director of transportation and environmental services shall approve development or redevelopment in a RPA only if it is found that the regulated activity is in compliance with these regulations and that the applicant has demonstrated, by a preponderance of the evidence, that the proposed development or redevelopment meets or exceeds the following standards and the buffer requirements of section 13-109(B):

(1) No more land shall be disturbed than is necessary to provide for the proposed use, development or redevelopment.

(2) Indigenous vegetation shall be preserved to the maximum extent possible consistent with the use, development or redevelopment proposed.

(3) Development or redevelopment shall minimize impervious cover consistent with the use and development allowed.

(4) The proposed development or redevelopment shall comply with the Erosion and Sedimentation Control regulations in the city code.

(5) Stormwater management requirements:

(a) Any maintenance, alteration, use or improvement to an existing structure which does not degrade the

quality of surface water runoff is exempt from stormwater management requirements.

(b) Estimated post-development nonpoint source pollution load shall not exceed the estimated predevelopment nonpoint source pollution load of runoff based upon average land cover conditions within the city as calculated using standards, consistent with good engineering practice, established by the director of transportation and environmental services pursuant to section 13-104(C). (Redevelopment shall comply with additional criteria in section 13-110.)

(c) The following options will be considered to comply with the stormwater management requirements of these regulations for development and redevelopment:

(1) Incorporation of on-site BMPs that achieve the required control for development and redevelopment as determined by calculation procedures and BMP efficiencies in standards, consistent with good engineering practice, established by the director of transportation and environmental services pursuant to section 13-104(C). A maintenance agreement for any BMPs existing or installed is required, and redevelopment shall comply with additional criteria in section 13-110; or

(2) Compliance with a locally adopted regional stormwater management program incorporating pro-rata share payments pursuant to the authority provided in section 15.1-466(j) of the Code of Virginia or a locally adopted regional stormwater management program adopted pursuant to the authority provided in section 15.1-292.4 of the Code of Virginia that results in achievement of equivalent water quality protection; or

(3) Compliance with a state or locally implemented program of stormwater discharge permits pursuant to section 402(p) of the Federal Clean Water Act, as set forth in 40 CFR 122, 123, 124 and 504, dated November 16, 1990.

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13-108 Development and uses permitted in RMAs. Development, redevelopment and uses authorized by the underlying zone are permitted in the RMA provided such activity is carried out in accordance with the performance requirements set forth in sections 13-112 and 13-113.

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(6) The non-water dependent portion of a development encompassing both a RPA and RMA is located outside of a RPA;

(7) Access for development or redevelopment is provided with the minimum disturbance necessary; where possible, only a single point of access shall be provided; and

(8) The regulated activity is consistent with the 1992 Master Plan for the City of Alexandria, Virginia.

(B) *Buffer requirements for RPAs:*

(1) The buffer shall achieve 75 percent reduction of sediments and 40 percent reduction of nutrients. A 100 foot wide buffer shall be considered adequate to meet this standard.

(2) In order to maintain the functional value of the buffer area, indigenous vegetation may be removed only to provide for reasonable sight lines, access paths, general woodlot management, and BMPs as follows:

(a) Trees may be pruned or removed as necessary to provide for sight lines and vistas, provided that where removed, they shall be replaced with other vegetation that is equally effective in retarding runoff, preventing erosion, and filtering nonpoint source pollution from runoff; such shall require the approval of the city arborist.

(b) Any path shall be constructed and surfaced so as to effectively control erosion.

(c) Dead, diseased, or dying trees or shrubbery may be removed and silvicultural thinning may be conducted as approved by the City Arborist. The City Arborist may approve a long term management plan for a specific RPA which complies with professionally recognized management practices.

(d) For shoreline erosion control projects, trees and woody vegetation may be removed, necessary control techniques employed, and appropriate vegetation established, all as approved by the City Arborist, to protect or stabilize the shoreline in accordance with the best available technical advice and applicable permit conditions or requirements.

(3) Exceptions to buffer requirements.

(a) The buffer may be reduced to 50 feet if the director of transportation and environmental services determines that a combination of a smaller buffer and appropriate BMPs located landward of the buffer achieves a 75 percent reduction of sediment and 40 percent reduction in nutrients and achieves water quality protection, pollutant removal and water resource conservation.

(b) If buffer requirements reduce buildable area on lots recorded before October 1, 1989, the director of transportation and environmental services may allow modifications as follows:

(1) The reduction shall be the minimum necessary to achieve a reasonable buildable area for a principal

structure and necessary utilities;

(2) If possible, equal area shall be established elsewhere on the site in a way to maximize water quality protection; and

(3) The buffer shall in no case be less than 50 feet.

13-110 Additional performance requirements for redevelopment in RPAs.

(A) The director of transportation and environmental services shall approve redevelopment in a RPA only if it is found that the regulated activity is in compliance with these regulations and that the applicant has demonstrated by a preponderance of the evidence that the proposed redevelopment meets or exceeds the following standards:

(1) If currently served by properly functioning BMPs, the regulated activity shall not increase nonpoint source pollution load in runoff;

(2) If not served by such BMPs, regulated activity shall reduce estimated nonpoint source pollution load in runoff by ten percent based on actual predevelopment and post development site conditions; or

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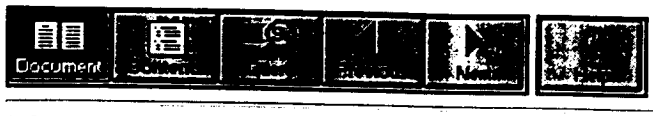

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(3) In addition to available stormwater management options delineated in section 13-109, a redevelopment site that is completely impervious as currently developed shall be considered to comply with the stormwater management requirements of these regulations if the applicant restores a minimum 20 percent of the site to vegetated open space.

(B) Redevelopment shall not result in any net-increase in impervious cover.

(C) These requirements apply in addition to, and in case of conflict shall control over, the requirements of section 13-109.

13-111 Standards for water quality impact assessment.

(A) *Evaluation procedure.*

(1) The director of transportation and environmental services shall approve a water quality minor impact assessment only if it is found that the proposed regulated activity is in compliance with these regulations and that the applicant has demonstrated by a preponderance of the evidence that the development or redevelopment, including any proposed modification or reduction to the buffer area, is consistent with these regulations and shall make a finding based upon the following criteria:

(a) The necessity of the proposed encroachment and the ability to place improvements elsewhere on the site to avoid disturbance of the buffer area;

(b) Impervious surface is minimized;

(c) Proposed BMPs, where required achieve the requisite reductions in pollutant loadings;

(d) The development, as proposed, meets the purpose and intent of these regulations;

(e) The cumulative impact of the proposed development when considered in relation to other development within the RPA in the vicinity, both existing and proposed, will not result in a significant degradation of water quality.

(2) The director of transportation and environmental services shall approve a water quality major impact assessment only if it is found that the proposed regulated activity is in compliance with these regulations and that the applicant has demonstrated by a preponderance of the evidence that the development or redevelopment, including any proposed modification to the buffer area, is consistent with these regulations and shall make a finding based upon the following criteria:

(a) Within any RPA, the proposed development is water-dependent or constitutes redevelopment;

(b) The disturbance of wetlands shall comply with state and federal regulations; **R0070595**

(c) The development will not result in significant disruption of the hydrology of the site;

(d) The development will not result in significant degradation of water quality that could adversely affect aquatic vegetation or life;

(e) The development will not result in unnecessary destruction of plant material on site;

(f) Proposed erosion and sediment control measures are adequate to achieve the required reductions in runoff, and prevent off-site transport of sediment during and after construction;

(g) Proposed stormwater management measures are adequate to control the stormwater runoff to achieve the required standard for pollutant control;

(h) Proposed revegetation of disturbed areas will provide adequate erosion and sediment control benefits, as determined by the director of transportation and environmental services.

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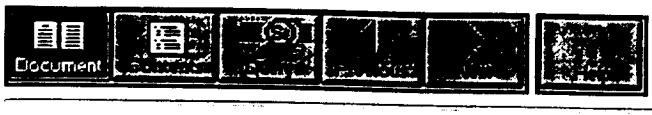

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13-111 Standards for water quality impact assessment.

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(3) Upon receipt of any water quality major impact assessment application, the director of transportation and environmental services may determine if review by the Chesapeake Bay Local Assistance Department (CBLAD) is warranted and may request CBLAD to review the assessment and respond with written comments. Any comments by CBLAD will be incorporated into the final review by the director of transportation and environmental services provided that such comments are provided by CBLAD within 90 days of the request.

13-112 General performance requirements for development and redevelopment in RMAs.

(A) The director of transportation and environmental services shall approve a development or redevelopment in a RMA only if it is found that the regulated activity is in compliance with these regulations and that the applicant has demonstrated, by a preponderance of the evidence, that the proposed development or redevelopment meets or exceeds the following standards:

(1) No more land shall be disturbed than is necessary to provide for the use and development proposed.

(2) Indigenous vegetation shall be preserved to the maximum extent possible consistent with the use and development proposed.

(3) Land development shall minimize impervious cover consistent with the use or development proposed.

(4) Development exceeding 2,500 square feet of disturbance shall comply with the Erosion and Sedimentation Control regulations in the city code.

(5) Stormwater management requirements:

(a) Any maintenance, alteration, use or improvement to an existing structure which does not degrade the quality of surface water runoff is exempt from stormwater management requirements.

(b) Estimated post-development nonpoint source pollution load shall not exceed the estimated predevelopment nonpoint source pollution load of runoff based upon average land cover conditions within the city, as calculated using standards consistent with good engineering practice established by the director of transportation and environmental services pursuant to section 13-104(C).

(c) The following options will be considered to comply with the stormwater management requirements of these regulations for development and redevelopment:

(1) Incorporation of on-site BMPs that achieve the required control for development and redevelopment as determined by calculation procedures and BMP efficiencies in standards established by the director of transportation and environmental services pursuant to section 13-104(C) consistent with good engineering practice. A maintenance agreement for any BMPs existing or installed is required, and redevelopment shall comply with additional criteria in section 13-113; or

(2) Compliance with a locally adopted regional stormwater management program incorporating pro-rata share payments pursuant to the authority provided in section 15.1-466(j) of the Code of Virginia or a

locally adopted regional stormwater management program adopted pursuant to the authority provided in section 15.1292-4 of the Code of Virginia that results in achievement of equivalent water quality protection; or

(3) Compliance with a state or locally implemented program of stormwater discharge permits pursuant to section 402(p) of the federal Clean Water Act, as set forth in 40 C.F.R. 122, 123, 124 and 504, dated December 7, 1988.

(B) Redevelopment shall comply with the additional criteria in section 13-113.

13-113 Additional performance requirements for redevelopment in RMAs.

(A) The director of transportation and environmental services shall approve redevelopment in a RMA only if it is found that the regulated activity is in compliance with these regulations and that the applicant has demonstrated by a preponderance of the evidence that the proposed redevelopment meets or exceeds the following standards:

(1) If currently served by properly functioning BMPs, regulated activity shall not increase nonpoint source pollution load in runoff;

(2) If not served by such BMPs, regulated activity shall reduce estimated nonpoint source pollution load in runoff by ten percent based on actual predevelopment and post-development site conditions; or

(3) In addition to available stormwater management options delineated in section 13-118, a redevelopment site that is completely impervious as currently developed shall be considered to comply with the stormwater management requirements of these regulations if the applicant restores a minimum 20 percent of the site to vegetated open spaces.

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13-111 Standards for water quality impact assessment.

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(B) These requirements apply in addition to, and in case of conflict shall control over, the requirements of section 13-112.

13-114 Development review process. Any development or redevelopment exceeding 2,500 square feet of land disturbance within the CBPA overlay district shall be subject to the following development review process prior to any clearing of the site or the issuance of any building, land use or land development permit. Any development or redevelopment in a RPA of 2,500 square feet or less of land disturbance shall be subject to approval of a water quality impact assessment as detailed in section 13-118, prior to any clearing of the site or the issuance of any building, land use or land development permit.

13-115 Required information.

(A) The development review process application shall consist of the plans and studies identified below, such application forms as the director of transportation and environmental services shall require and the appropriate fees, which together shall constitute the plan of development. The plans and studies identified in this section may be coordinated or combined with other required submission materials, as deemed appropriate by the director of transportation and environmental services. The plan of development shall contain the following elements:

(1) A site plan in accordance with the provisions of section 11-400 of this ordinance or other applicable law and, if applicable, a subdivision plat in accordance with the provisions of chapter 5, title 7 of the city code.

(2) An environmental site assessment as detailed in section 13-116;

(3) A landscape plan in accordance with the provisions of section 11-410(CC) of this ordinance certified by qualified design professionals practicing within their areas of competence;

(4) A stormwater management plan as detailed in section 13-117;

(5) An erosion and sediment control plan in accordance with the provisions of chapter 4, title 5 of the city code;

(6) For all development or redevelopment within an RPA, or within an environmentally sensitive area as determined by the director of transportation and environmental services pursuant to section 13-118(C) or 13-118(D), or for an exception under section 13-120, a Water Quality Impact Assessment as detailed in section 13-118.

13-116 Environmental site assessment.

(A) The environmental site assessment shall clearly delineate the following environmental features:

(1) Tidal wetlands;

(2) Tidal shores;

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(3) Nontidal wetlands connected by surface flow and contiguous to tidal wetlands or tributary streams;

(4) Highly erodible and highly permeable soils if available from existing public documents or documents available to the applicant;

(5) A 100-foot buffer area located adjacent to and landward of the components listed in sections 13-116(A)(1) through (3) above, and along both sides of any tributary stream;

(6) A listing of all wetlands permits required by law (evidence that such permits have been obtained shall be presented to the director of transportation and environmental services before permits will be issued to allow commencement of grading or other on-site activity.)

(B) Wetlands delineations shall be performed consistent with current procedures promulgated by the U.S. Army Corps of Engineers and the Environmental Protection Agency.

(C) The environmental site assessment shall delineate the site-specific geographic extent of the RPA.

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13-116 Environmental site assessment.

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(D) The environmental site assessment shall be drawn at the same scale as the preliminary site plan or subdivision plat, and shall be certified as complete and accurate by a professional engineer or a certified land surveyor. This requirement may be waived by the director of transportation and environmental services when the proposed use or development would result in less than 5,000 square feet of disturbed area.

(E) In the event no part of the site plan area contains any RPA elements as enumerated in section 13-105(B), the applicant and a professional engineer or a certified land surveyor, may, in lieu of providing an environmental site assessment plat, so certify, in writing and under oath, to the director of transportation and environmental services. Any permit issued in reliance upon such a certification which certification is factually inaccurate or incorrect shall be void *ab initio*, and such invalidity shall be in addition to any other penalties which may be imposed upon the makers of such certification.

13-117 Stormwater management plan.

(A) A stormwater management plan shall be developed so that from the site, the post-development peak runoff rate from a two-year storm and a ten-year storm, considered individually, shall not exceed their respective predevelopment rates. This peak flow rate requirement shall not apply to single-family residences separately built and not part of a subdivision, including additions or modifications to existing single-family detached residential structures. When the requirements of the city's Erosion and Sediment Control Ordinance are otherwise complied with, the director of transportation and environmental services may waive this peak flow rate requirement for other development not exceeding one-half acre of land disturbance. The director of transportation and environmental services may also waive this requirement in cases where stormwater detention would conflict with the city's flood management programs.

(B) The water quality volu e from the site must be treated in a best management practice (BMP) approved by the director of transportation and environmental services. If the water quality requirements of sections 13-109 through 13-113 require a smaller BMP or do not require a BMP, the water quality volume treatment requirement may be waived or modified by the director of transportation and environmental services for single-family residences separately built and not part of a subdivision, including additions to existing single-family detached residential structures, for sites not exceeding one-half acre of disturbance, or for any other site if the total size of preexisting impervious area is reduced by an amount equal to or greater than 20 percent of the entire site. The director of transportation and environmental services may waive this requirement if stormwater detention would conflict with the city's flood management programs.

(C) Post-development concentrated surface waters shall not be discharged on adjoining property, unless an easement expressly authorizing such discharge has been granted by the owner of the affected land.

(D) The owner or developer may continue to discharge storm water which has not been concentrated (sheet flow) into lower lying property if:

(1) The peak flow rate for a 10-year storm after development does not exceed the predevelopment peak flow rate;

(2) The increase in total volume of runoff caused by the development will not have an adverse impact on the lower-lying property; and

(3) There will be no exacerbation of existing drainage problems on the lower-lying property, or other downstream property.

(E) The stormwater management plan shall contain maps, charts, graphs, tables, photographs, narrative descriptions, explanations, calculations, and citations to supporting references as appropriate to communicate the information required by this Article XIII. At a minimum, the stormwater management plan must contain the following:

(1) Location and design of all planned stormwater control devices;

(2) Procedures for implementing non-structural stormwater control practices and techniques;

(3) Pre- and post-development nonpoint source pollutant loadings with supporting documentation of all utilized coefficients and calculations;

(4) Pre- and post-development peak runoff rates from the site for both a two-year storm and ten year storm, considered individually, with supporting documentation of all utilized coefficients and calculations;

(5) For facilities, verification of structural soundness, including a professional engineer certification as applicable;

(F) Site specific facilities for phased projects shall be designed for the ultimate development of the contributing project watershed based on zoning, comprehensive plans, local public facility master plans, or other similar planning documents.

(G) All engineering calculations must be certified by a professional engineer or a licensed class IIIB surveyor and performed in accordance with procedures, consistent with good engineering practice, established by the director of transportation and environmental services pursuant to section 13-104(C).

(H) The plan shall establish a long-term schedule for inspection and maintenance of stormwater management facilities that includes all maintenance requirements and persons responsible for performing maintenance. If the designated maintenance responsibility is with a party other than the City of Alexandria, then a maintenance agreement shall be executed between the responsible party and the city.

13-118 Water quality impact assessment.

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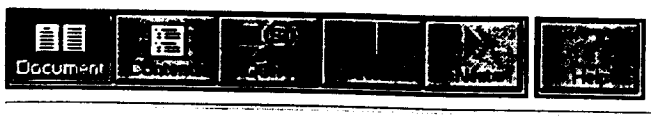

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13-118 Water quality impact assessment.

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(A) The purpose of the water quality impact assessment is to:

(1) Identify the impacts of proposed development on water quality and lands within the RPAs;

(2) Ensure that, where development does take place within RPAs, it will be located on those portions of the site and in a manner that will be least disruptive to the natural functions of the RPAs; and

(3) Specify mitigation which will address water quality protection under the foregoing circumstances or under an exception under section 13-120.

(B) A Water Quality Impact Assessment is required for any proposed development or redevelopment in the RPA. There are two types of water quality impact assessments: water quality minor impact assessments and water quality major impact assessments.

(C) A Water Quality Minor Impact Assessment is required for development or redevelopment within RPAs or under an exception which involves 5,000 or less square feet of land disturbance; or for any development or redevelopment within the RMA which involves 5,000 or less square feet of land disturbance adjacent to an RPA, if required by the director of transportation and environmental services due to the presence or proximity of wetlands, potential for harmful discharge of contaminants from the property, or slopes greater that 15 percent which are proposed to be disturbed. A minor impact assessment shall demonstrate, through acceptable calculations, that the remaining buffer area and necessary BMPs will result in removal of 75 percent of sediments and 40 percent of nutrients from post-development/redevelopment stormwater runoff. Such an assessment shall include a site plan which shows the following:

(D) A Water Quality Major Impact Assessment is required for development or redevelopment within RPAs or under an exception which involves more than 5,000 square feet of land disturbance; or for any development or redevelopment within the RMA which involves more than 5,000 square feet of land disturbance adjacent to an RPA, if required by the director of transportation and environmental services due to the presence or proximity of wetlands, potential for harmful discharge of contaminants from the property, or slopes greater than 15 percent which are proposed to be disturbed. The following elements shall be included in a water quality major impact assessment:

(E) (1) A water quality minor impact assessment shall be certified as complete and accurate by a professional engineer or a certified land surveyor.

(2) The additional elements required in a water quality major impact assessment shall be certified as complete and accurate by a professional engineer and by a qualified environmental scientist.

13-119 Final plans.

(A) Final site plans and subdivision plats subject to this Article XIII for all lands within the CBPA shall include the following additional information:

(1) A copy showing issuance of all wetlands permits required by law;

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(2) A maintenance agreement between the city and applicant as deemed necessary and appropriate by the director of transportation and environmental services to ensure proper maintenance of best management practices in order to assure their continued performance.

(B) Installation and Bonding Requirements.

(1) Where buffer areas, landscaping, stormwater management facilities or other specifications of an approved plan are required, no certificate of occupancy shall be issued until the installation of required plant materials or facilities is completed, in accordance with the approved site plan.

(2) When the occupancy of a structure is desired prior to the completion of the required landscaping, stormwater management facilities, or other specifications of an approved plan, a certificate of occupancy may be issued only if the applicant provides to the city a surety bond or equivalent satisfactory to the director of transportation and environmental services in amount equal to the remaining plant materials, related materials, and installation costs of the required landscaping or facilities and/or maintenance costs for any required stormwater management facilities during the construction period.

(3) Unless otherwise approved by the director of transportation and environmental services for a phased project, all required landscaping shall be installed and approved by the first planting season following issuance of a certificate of occupancy or the surety bond may be forfeited to the city.

(4) Unless otherwise approved by the director of transportation and environmental services for a phased project, all required stormwater management facilities or other specifications shall be installed and approved within 18 months of project commencement. Should the applicant fail, after proper notice, to initiate, complete or maintain appropriate actions required by the approved plan, the surety bond may be forfeited to the city. The city may collect from the applicant the amount by which the reasonable cost of required actions exceeds the amount of surety held.

(5) After all required actions of the approved site plan have been completed, the applicant must submit a written request for a final inspection. If the requirements of the approved plan have been completed to the satisfaction of the director of transportation and environmental services, such unexpended or unobligated portion of the surety bond held shall be refunded to the applicant or terminated within 60 days following the receipt of the applicant's request for final inspection. The director of transportation and environmental services may require a certificate of substantial completion from a professional engineer or licensed surveyor before making a final inspection.

13-120 Exceptions.

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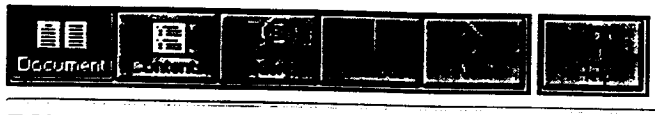

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13-120 Exceptions.

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(A) Unless otherwise provided in this Article XIII, a request for an exception to the requirements of this Article XIII shall be made pursuant to this section in writing to the director of transportation and environmental services. The request shall identify the impacts of the proposed exception on water quality and on lands within the RMA and RPA through the performance of a water quality impact assessment which complies with the provisions of section 13-118 to the extent applicable.

(B) The director of transportation and environmental services shall review the request for an exception and the water quality impact assessment and may grant the exception with such conditions and safeguards as deemed necessary to further the purpose and intent of this Article XIII if the director of transportation and environmental services finds that the applicant has demonstrated by a preponderance of the evidence that:

(1) Granting the exception will not confer upon the applicant any special privileges that are denied to other property owners in the CBPA overlay district;

(2) The exception is not based upon conditions or circumstances that are self-created or self-imposed, nor does the exception arise from conditions or circumstances either permitted or nonconforming that are related to adjacent parcels;

(3) The exception is the minimum necessary to afford relief;

(4) The exception will be consistent with the purpose and intent of the overlay district, and not injurious to water quality, the neighborhood or otherwise detrimental to the public welfare; and

(5) Due to the particular physical surroundings, shape, topographical condition, geotechnical characteristics of the site's soils and rock materials or other extraordinary situation or condition of the specific property involved, the strict application of the requirements of this Article XIII would effectively prohibit or unreasonably restrict the utilization of the property or would constitute a clearly demonstrable hardship approaching confiscation.

(C) Any person aggrieved by a decision of the director of transportation and environmental services under this section 13-120 may appeal to the planning commission as provided in section 13-121.

13-121 Appeals.

(A) Any person aggrieved by a final case decision of the director of transportation and environmental services in the administration, interpretation or enforcement of this Article XIII or on any application hereunder may appeal such decision to the planning commission, by filing a notice of appeal, in writing, stating the grounds of appeal, with the secretary of the planning commission within 14 days of the issuance of such decision; provided, that any person aggrieved, who had no actual knowledge of the issuance of such decision, may file an appeal within 14 days of the last day on which notice provided in section 11-300 or section 11-408 of this ordinance is given for any element of the plan of development. A notice of appeal shall be accompanied by a filing fee of $100.00.

(B) The planning commission shall conduct a public hearing on any appeal filed pursuant to section 13-121(A), notice for which shall be provided in accordance with the applicable provisions of section

11-300 of this ordinance. Following the conclusion of the hearing, the commission may affirm, reverse or modify the decision of the director, or vacate the decision and remand the matter to the director for further consideration.

(C) Any person aggrieved by a decision of the planning commission issued pursuant to section 13-121(B) may appeal the decision to the city council, by filing a notice of appeal, in writing, stating the grounds of appeal, with the city clerk within 14 days of the issuance of the decision.

(D) The city council shall conduct a public hearing on any appeal filed pursuant to subsection (C), notice for which shall be provided in accordance with the applicable provisions of section 11-300 of this ordinance. Following the conclusion of the hearing, the council may affirm, reverse or modify the decision of the commission, or vacate the decision and remand the matter to the commission or the director for further consideration.

(E) Notwithstanding the provisions of subsections (A) through (D) above, an applicant or any aggrieved party who elects to appeal shall appeal the director's decision of approval or disapproval of a stormwater management plan application by filing a notice of appeal with the director within 30 days after service of such decision. The filing of such notice, and proceedings thereafter, shall be governed by Part 2A of the Rules of the Supreme Court of Virginia, and judicial review shall be had in the Circuit Court of the City of Alexandria on the record previously established, and shall otherwise be in accordance with the Administrative Process Act, Virginia Code sections 9-6.14:1 et seq.

13-122 Noncomplying use status and related matters.

(A) Any land use or land development lawfully existing on January 28, 1992, and any land use or land development for which a final site plan, approved on or before January 28, 1992, continues in force and effect, which does not comply with the provisions of this Article XIII, shall be deemed a noncomplying land use or land development. A noncomplying land use or land development, if not lawfully existing on January 28, 1992, may retain its noncomplying status and be constructed without compliance with this Article XIII and in accordance with its approved final site plan, any minor amendments thereto approved by the director of transportation and environmental services, and any non-minor amendments thereto approved by the planning commission or city council, as applicable, so long as such non-minor amendments do not, individually or in the aggregate, cause either a net increase in impervious surface or any additional encroachment into RPA over the level of imperviousness or encroachment associated with the land use or land development as previously approved; provided, that any such non-minor amendments shall comply with the provisions of this Article XIII to the maximum extent feasible. If existing or when constructed, a noncomplying land use or land development shall be permitted o continue indefinitely and shall be considered a legal land use or land development, but shall be subject to the following restrictions:

(1) *Expansion.* No noncomplying land use or land development may be physically enlarged or expanded unless such enlargement or expansion complies with the provisions of this Article XIII, and any other applicable provisions of law.

(2) *Reconstruction.* If a noncomplying land development is destroyed, demolished or otherwise removed, it may be reconstructed; provided, that such reconstruction shall be categorized as development or redevelopment, as the case may be, and shall comply with the provisions of this Article XIII and any other applicable provisions of law.

(3) *Repairs and maintenance.* A noncomplying land development may be remodeled, renovated, maintained, repaired and altered so long as such work complies with the provisions of this Article XIII, and any other applicable provisions of law.

(B) Unless deemed a noncomplying land use or land development under section 13-122(A), or unless granted an exemption pursuant to section 13-123, any land use or land development subject to this Article XIII which is the object of any land use, land development or construction permit application, including a renewal or extension application, pending before any department, board or commission of

the city, before the city council, or on judicial review on January 28, 1992, or thereafter filed with any such department, board or commission, shall comply with the provisions of this Article XIII.

next...



ZONING ORDINANCE City of ALEXANDRIA, VIRGINIA Codified through Ord. No. 4001, adopted May 16, 1998. (Supplement No. 17)
ARTICLE XIII. ENVIRONMENTAL MANAGEMENT
13-122 Noncomplying use status and related matters.

...previous

(C) Unless deemed a noncomplying land use or land development under section 13-122(A), or unless granted an exemption pursuant to section 13-123, any land use or land development subject to this Article XIII which is the object of a land use, land development or construction permit approval in force and effect on January 28, 1992, shall comply with the provisions of this Article XIII. Any renewal or extension of any such approval shall comply with the provisions of this Article XIII.

(D) For purposes of this section 13-122, a land development for which a special use permit had been issued under section 7-6-28(i), -30(k), -31(k), -35(m) or -44(h) of the former zoning code and recorded among the land records of the city prior to January 28, 1992, and for which no final site plan is required to be filed subsequent to the recordation of the permit, shall be considered as being the object of a final site plan approved prior to January 28, 1992.

13-123 Determination of undue hardship exemption.

(A) Upon application, the director of transportation and environmental services may exempt from the provisions of this Article XIII a specific development which, on January 28, 1992, was the object of an approved preliminary site plan, including a preliminary site plan which had been approved along with a special use permit granted under section 7-6-355 of the former zoning code, whenever the director of transportation and environmental services finds that the applicant has demonstrated that full application of the provisions of this Article XIII would result in undue hardship under the standards set out in section 13-123(B); provided, that the provisions of section 13-123(G) shall apply to any development for which an exemption is granted under this section.

(B) In considering whether an applicant has demonstrated undue hardship, the director of transportation and environmental services shall consider the following standards where applicable:

(1) Whether the applicant has in good faith relied to his detriment on the preliminary site plan approval prior to January 28, 1992, in a manner that makes it inequitable to enforce the terms of this Article XIII with respect to the applicant's property.

(2) The extent to which the applicant has, prior to January 28, 1992, and in reliance on the preliminary site plan approval, made a substantial commitment of money or resources directly associated with physical improvements on the land, such as grading, excavation, installation of utility infrastructure or other public improvement, or for the design of specific buildings and improvements to be constructed on the site.

(3) The extent to which the applicant has, prior to January 28, 1992, and in reliance on the preliminary site plan approval, secured permits for, and commenced or completed, the construction of site improvements and buildings in part but not all of a development that was contemplated to extend over a period of months or years.

(4) Whether the applicant has, prior to January 28, 1992, and in reliance on the preliminary site plan approval, made contractual commitments to complete buildings and deliver title thereto or occupancy thereof.

(5) Whether the applicant has, prior to January 28, 1992, and in reliance on the preliminary site plan

approval, incurred financial obligations to a lending institution which the applicant will be unable to meet unless he is permitted to proceed with the proposed development.

(6) Whether enforcement of the terms of this Article XIII will expose the applicant to substantial monetary liability to third persons.

(7) Whether undue hardship has been demonstrated only with respect to an identifiable and discrete portion of the proposed development.

(C) The fact that the property has been or is in a particular zoning classification under this ordinance, or any prior zoning ordinance of the city, or that a specific development plan has or has not been approved, shall not, in itself, establish undue hardship.

(D) Any person, firm, or corporation having an ownership interest in property may file an application for a determination of undue hardship. Such application shall be filed with the director of transportation and environmental services, shall contain a recital of the facts which are claimed to support the application, and shall contain such other information as the director of transportation and environmental services may specify.

(E) A reasonable opportunity for written public comment on an application shall be afforded by the director of transportation and environmental services.

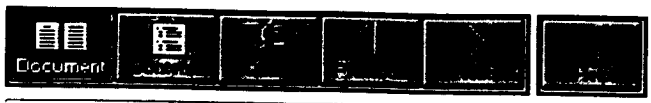
(F) Within 30 days after the close of the comment period, the director of transportation and environmental services shall issue a decision on the application and shall serve the same by certified mail on the applicant and any commentors who have so requested. Such decision shall contain written findings of fact and, if applicable, conclusions of law.

(G) In granting an exemption pursuant to this section 13-123, the director of transportation and environmental services shall require that the previously approved development comply with the provisions of this Article XIII to the maximum extent feasible, and the director may specify any conditions and safeguards deemed necessary to further the purpose and intent of this article.

(H) Nothing in this section 13-123 shall be construed as excusing a land development granted an exemption pursuant to section 13-123(A) from any of the conditions imposed in conjunction with the development's preliminary site plan approval, or any other approval, including where applicable those imposed by the city code, and any exemption shall itself be conditioned upon the satisfaction of all such conditions not waived or modified by the director of transportation and environmental services.

(I) A land development granted an exemption pursuant to section 13-123(A) may retain its exemption and be constructed in accordance with its approved preliminary site plan and the provisions of this Article XIII imposed by the director of transportation and environmental services pursuant to section 13-123(G), with any minor amendments to that site plan approved by the director of transportation and environmental services, and with any non-minor amendments thereto approved by the planning commission or city council, as applicable, so long as such non-minor amendments do not, individually or in the aggregate, cause either a net increase in impervious surface or any additional encroachment into RPA over the level of imperviousness or encroachment associated with the land development as previously approved; provided, that any such non-minor amendments shall comply with the provisions of this Article XIII to the maximum extent feasible.

(J) For purposes of this section 13-123, a land development for which a special use permit had been issued under section 7-6-28(i), -30(k), -31(k), -35(m) or -44(h) of the former zoning code and recorded among the land records of the city prior to January 28, 1992, and for which one or more final site plans are required to be filed subsequent to the recordation of the permit, shall be considered as being the object of an approved preliminary site plan approved prior to January 28, 1992; provided, that any such land development or portion thereof for which a required final site plan has been approved prior to January 28, 1992, shall be considered, for purposes of section 13-122, as being the object of a final site plan approved prior to January 28, 1992.



ZONING ORDINANCE City of ALEXANDRIA, VIRGINIA Codified through Ord. No. 4001, adopted May 16, 1998. (Supplement No. 17)
ARTICLE XIII. ENVIRONMENTAL MANAGEMENT
13-123 Determination of undue hardship exemption.

...previous

(Ord. No. 3610, §§ 1--14, 12-12-92; Ord. No. 3990, § 1, 4-18-98)

APPENDIX A ZONING MAP AMENDMENTS

This appendix lists the amendments to the zoning map subsequent to June 24, 1992.

Ordinance

Number Date Property From To

3613 1-23-93 Map Parcel No. RM CD
74.02-11-15

3691 12-11-93 Map Parcel No. RA CG
49.00-05-40

3692 12-11-93 Map Parcel No. CO CRMU-M
47.00-02-07

3698 1-22-94 Map Parcel No. RM CL
54.04-12-02

Map Parcel No. CG CSL
58.00-03-02

3824 10-14-95 Map Parcel Nos. PC CSL
15.04-03-04
15.04-03-05
15.04-03-06
15.04-03-07
15.04-03-08
15.04-03-09

3840 1-20-96 Map Parcel No. RB CL
64.01-13-16

3843 2-24-96 Map Parcel No. UT OCH

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44.02-02-1.01

3859 4-13-96 Map Parcel No. RB OCM
54.02-04-1

3866 5-18-96 Map Parcel No. W-1 W-1
81.03-03-01

3880 6-25-96 Map Parcel Nos. OCH CDD-2
72.00-04-05,
79.00-01-01

Sketch Plan No. UT OCM-100
96-0002

Map Parcel Nos. OC CRMU-L
74.03-01-03,
74.03-02-01,
74.04-03-03

3918 3-15-97 Map Parcel Nos. CL RB
64.01-6-21,
64.01-6-22,
64.01-6-23

3951 9-13-97 Map Parcel Nos. R-20 RA
32.00-09-04,
32.00-09-06

3957 10-25-97 Map Parcel No. RM CD
64-04-02-21

3971 12-13-97 Map Parcel Nos. POS CG
48.00-05-05,
48.00-05-07

R0070611

Final Report

1999 Outreach Program

Bay Area Stormwater Management Agencies Association

Start at the Source
Design Guidance Manual
for Stormwater Quality Protection

Prepared 20 August 1999 by:



TOM RICHMAN & ASSOCIATES
Urban Design and Landscape Architecture

R0070612

Context

In 1997 the (San Francisco) Bay Area Stormwater Management Agencies Association (BASMAA) completed *Start at the Source – Residential Site Planning & Design Guidance Manual for Stormwater Quality Protection*. This manual addressed the importance of planning and designing for storm water quality.

The first printing of the manual was distributed through an outreach program sponsored by BASMAA and the participating stormwater programs. The outreach program consisted of a series of workshops held at Bay Area locations in 1997. The Manual received a national award in 1997 from the American Society of Landscape Architects, in the Communication category.

Because of the popularity of the manual and outreach program, BASMAA undertook to revise and expand the document. In 1999 an expanded *Start at the Source* was published. This updated version - *Start at the Source –Design Guidance Manual for Stormwater Quality Protection* - included not only guidance for residential projects, but was expanded to include a section on planning as well as design guidance for industrial and commercial sites. In response to requests for more detailed information, the 1999 edition also included a technical section that gives the characteristics, applications, design parameters, maintenance implications, economic considerations, and examples of specific design elements.

The 1999 updated Manual was accompanied by and distributed at another series of outreach programs, held at eight Bay Area locations from June through August 1999. This report summarizes the 1999 Outreach Program.

Purpose

The purposes of the outreach program are:

1. introduce participants to the manual, highlighting the updated sections

2. provide an opportunity for participants to use the manual in a design exercise, modeling the behavior they will use in their profession

3. provide an opportunity for participants to build relationships and share information on designing for stormwater quality

4. provide examples of built projects throughout the Bay Area, and illustrate the successes and failures of the stormwater controls that were implemented

5. to strengthen the identities of BASMAA and the regional stormwater programs as a coordinated resource for development professionals.

Regional Distribution and Attendance

The workshops were promoted through a series of flyers that were mailed to over 3,000 addresses around the Bay Area. The flyers targeted municipal planners, stormwater program managers, developers, consulting engineers, landscape architects, and policy makers. Mailing lists and databases were provided by the various stormwater programs and BASMAA. One flyer, provided by the consultants, was sent.

Pre-registration was coordinated by the consultants (except Contra Costa's extra workshop, which was handled by Contra Costa Clean Water Program). Participants were able to register by both phone and electronic mail. The consultants' web page also provided directions to each venue.

Workshops were held at eight locations, with dates and attendance as below:

Program/Location	*Date*	*Attendance*
San Mateo (Belmont)	June 17	43
Contra Costa (San Ramon)	June 22	67
Alameda (Fremont)	June 24	49
Marin (Marin Headlands)	June 29	40
San Francisco (SF)	June 30	44
Fairfield-Suisun/Vallejo (Vallejo)	July 15	82
Contra Costa (Walnut Creek)	July 22	76
Santa Clara (Campbell)	Aug 4	93
Total		494

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Workshops were offered free of charge. BASMAA funded five workshops, and Santa Clara County, San Francisco, and Contra Costa Clean Water Program funded an additional workshop each for their constituents.

Workshop Description

The workshops were designed by Tom Richman & Associates with input from an Outreach Work Group comprised of members of the BASMAA New Development Committee. Tom Richman & Associates led the workshops with facilitation assistance from UC Berkeley Extension students, UC Berkeley and San José State graduate students, in urban planning and landscape architecture, and from some of the core BASMAA New Development Committee members. The rooms were set with tables of eight to ten, each with a facilitator. This enabled the workshop to include a high percentage of hands-on, interactive techniques to engage participants in the design concepts and details.

A "Materials Bar" display was available to participants during the entire workshop. This consisted of samples of various materials discussed in *Start at the Source,* such as pervious concrete, turfblock, unit pavers, and aggregate. These were usually set out next to the food and refreshments to make them easily accessible by participants.

Approximately twenty "Project Posters" were displayed throughout the room. The 24 x 18" color posters showed site and detail photographs along with a project description and bullets summarizing the key stormwater controls of built projects throughout the Bay Area.

Each workshop followed a similar agenda:

8:00-8:30 Registration and refreshments

Each host program staffed the registration tables and provided participants with pre-printed name tags and a copy of the *Start at the Source* manual. The host program also provided coffee and refreshments.

8:30-9:00 Welcome

A representative from the host storm water program started off the workshop by welcoming participants and giving background information of *Start at the Source's* development. At some workshops the host introduced a local official such as the stormwater program coordinator, a local planning commissioner, or municipal agent, to offer an introductory comments targeted to local issues.

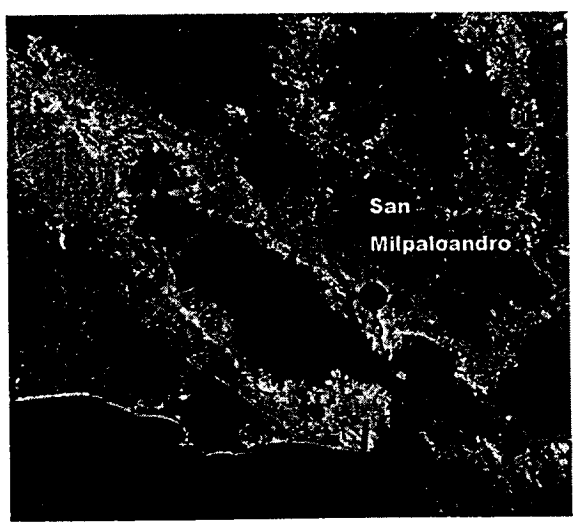
Tom Mumley, Urban Runoff Program Manager for the California Regional Water Quality Control Board, then advised participants how the RWQCB endorses the manual and encourages its use.

9:00-9:30 The City of San Milpaloandro

Tom Richman introduced the mythical city of San Milpaloandro. He indicated that the city, trying to be innovative, has implemented post-construction stormwater controls in new development, but each control has failed . Tom showed slides of failed, poorly designed, or poorly performing post-construction stormwater controls in built projects located throughout the Bay Area, attributing them to this mythical city and explaining the flaws . The purpose of highlighting these examples through the mythical city of San Milpaloandro was to enable participants to learn from and avoid repeating the same mistakes without blaming any particular local projects. It also allowed people to laugh at themselves and recognize that innovation requires a willingness to fail.

Examples from "San Milpaloandro" include:

- a grassy swale in which the 3" thickness of sod was not anticipated during the grading, so that the runoff cannot drain into swale
- retention basin that was intended to be an amenity, but design made it a hazard and forced it to be fenced off from residential development



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- grassy swale in parkway strip that was too narrow and didn't have enough slope
- check dams in a swale that the contractor installed with the notch flush with the flow line so that the water "wouldn't back up"
- detention basin that failed because it was receiving too much water
- pervious pavement "EcoStone" installed without filling voids with aggregate became tripping hazard

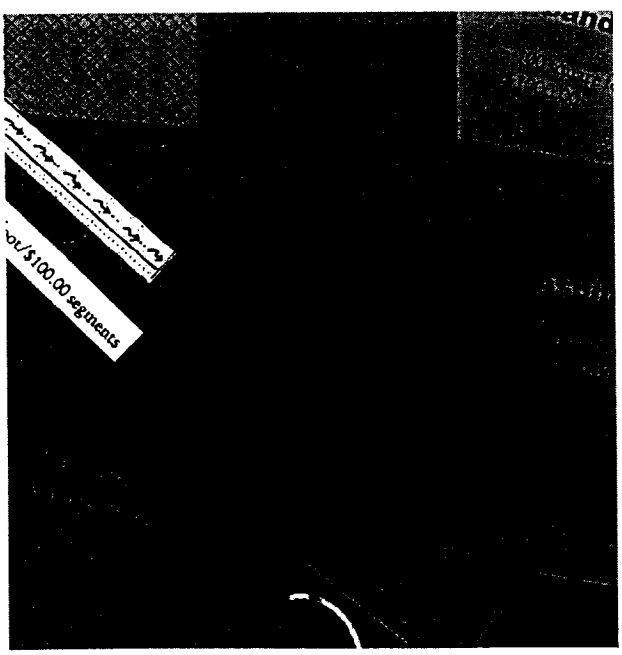
Following the slides, participants introduced themselves around the table, identified their professional roles, and offered suggestions on how the city of San Milpaloandro could have done things better. During this discussion, participants often shared experiences with built projects of their own (sometimes from the same projects in the slides).

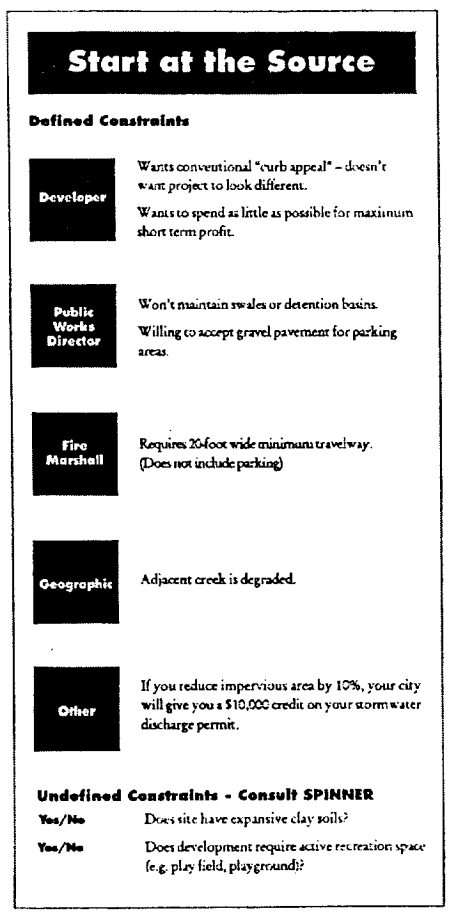
Tom then collected responses from whole group. Participants expressed the need for better communication, good coordination, technical competence, and designing stormwater controls into projects at the beginning of the project.

9:30-10:00 Introduction to Start at the Source – Design Guidance Manual
Slide show introduction to Start at the Source.

Using slides to navigate and illustrate, Tom Richman led the group through the Manual, chapter by chapter. Slides of document pages showing concepts and design techniques were complemented by slides of built examples in various locations around the Bay Area as well as the United States. Using post-it notes supplied at each table, Tom asked participants to bookmark important pages and sections in the document. In this way participants were engaged in the document, became familiar with using it, and had important pages marked for reference back at the office.

10:00-10:15 Break
A break was provided for refreshment. At some venues where there was an opportunity, Tom led the group on a short "field trip" into the parking lot or nearby the meeting room to prompt discussion on a how the area





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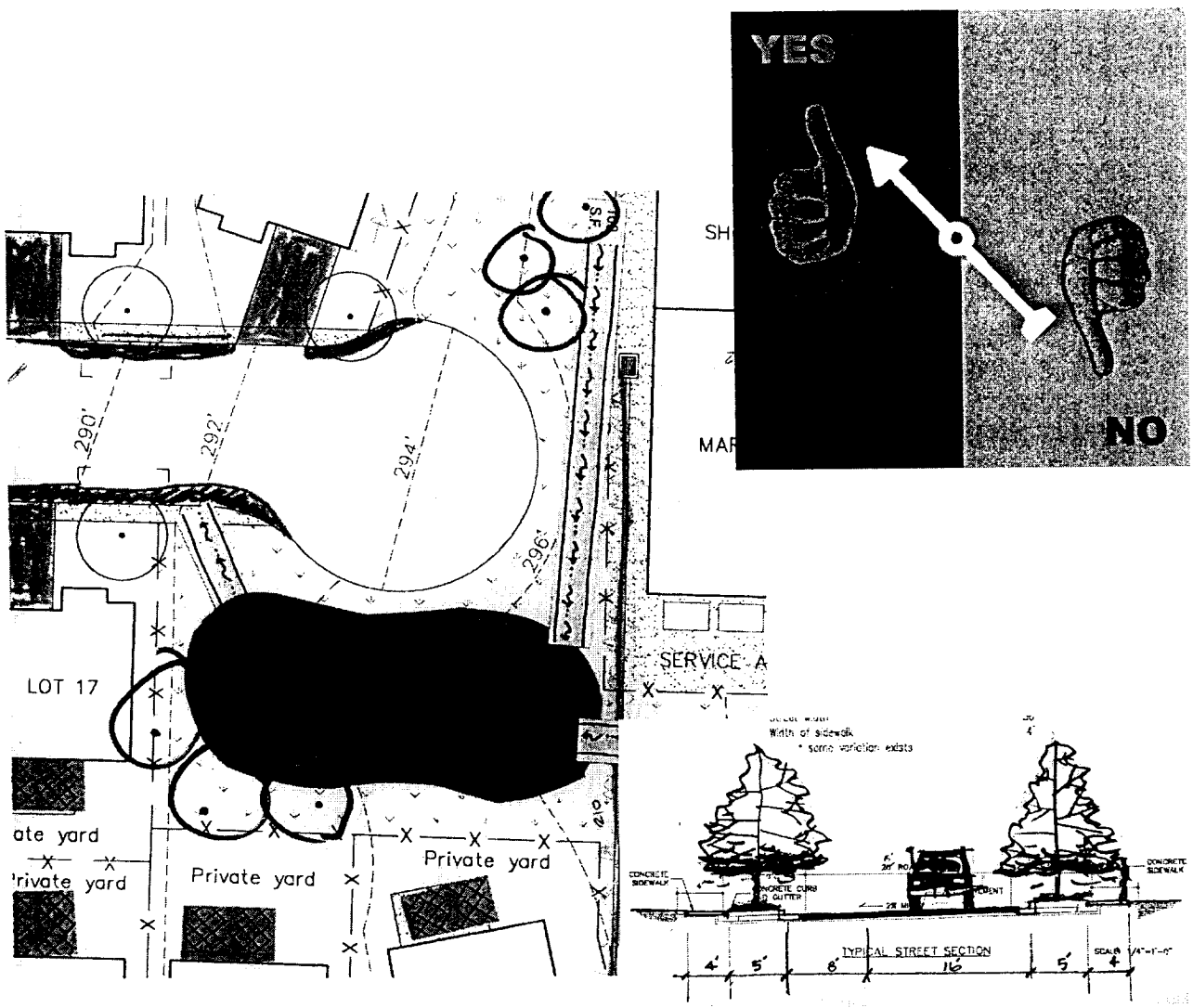
drains and how it could have been done differently using the concepts presented in the Manual. In this way, participants had an immediate real-world application of the ideas just presented in the slides.

10:20-11:45 Interactive Site Planning Exercise and Discussion

During the break, site plans for a real mixed-use residential and commercial project built in the Bay Area were set at each table. A tool-kit with materials needed for the exercise was also provided. Tom introduced the exercise, and gave the group instructions.

Participants at each table, assisted by a facilitator, performed a site analysis and design critique of the plan. Groups were given a budget and list of constraints. They were asked to incorporate stormwater controls into the site plan, within the given budget and constraints. Constraints related to the developer's attitude, public works director's and fire marshal's requirements, site geography, and other factors. Participants were instructed to keep the program and basic site plan, but were allowed to change or modify anything else within their constraints, using the design guidelines in the Manual. The goal of the exercise was to show that these details and techniques could be applied even in a typical site plan.

Colored paper and markers provided were used to represent pervious and impervious surfaces, water and landscape. Participants applied these materials in a collage-like way with tape and glue-stick to illustrate the modified techniques such as grassy swales, retention basins, and pervious parking bays, all the while tracking their costs.



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Participants at each table applied the site planning principles and design details in *Start at the Source* to modify the site plan into a more stormwater quality friendly development. They had to build consensus – it was common to hear groups debating various approaches and trade-offs – but were allowed to use the "spinner" to obtain a YES or NO answer to questions when they could not agree.

11:45- 12:00 Conclusion

Following the exercise, volunteers from a few tables presented their modified site plans to the entire group. This enabled the entire group to discuss the various alternative strategies illustrated by exercise.

At the close of the workshop, participants were asked to complete an evaluation. This form had been created with suggestions from the Outreach Work Group to gather information they would like to learn from participants. Following completion of the evaluation, each participant was given a free water bottle emblazoned with "Start at the Source" and the BASMAA logo, and was invited to stay for lunch and informal discussion.

12:00-1:00 Lunch

The workshop was consciously designed with a lunch period at its close. This unstructured dialog was, for many participants, a very important opportunity to reflect on the workshop and build relationships for further innovation. Lunch was provided free by each host program.

Participant Responses

Of a total 494 participants, 427 submitted evaluation forms. Responses were consistently very positive. Participants were asked to rate the workshop conent and process on a scale of 1 (worst) to 5 (best). The average rating for all responses was:

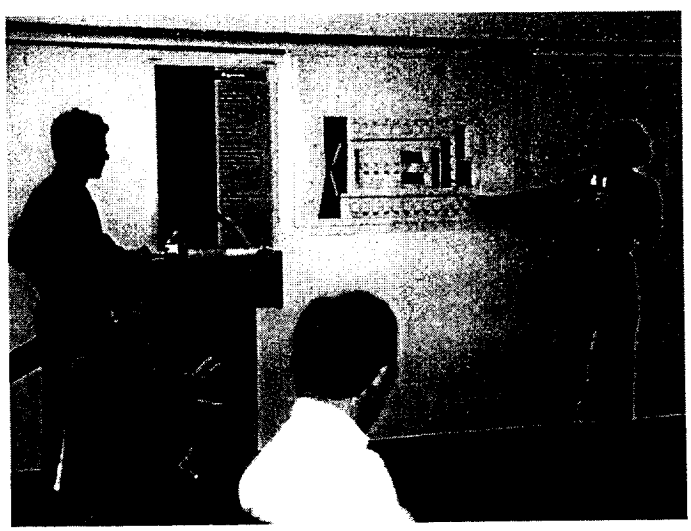
Content	4.3 (out of 5.0)
Process	4.2

The mode of all responses was 4. No participant rated the workshops below 3 for either content or format.

Significantly, participants who had attended a workshop in 1997 felt the 1999 version was better, more informative, and still worthwhile. Sample evaluation responses are below, and a complete summary is attached in Appendix 1.

"This was the best workshop that I've ever been to, hands down. It was very professionally run. Every detail was taken care of. The facilitators were extremely responsive and professional. Very good workshop." – Belmont participant





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"Hands-on activity was great! Fun, great chance to cooperate with others with different views." – San Ramon participant

"Glad to have the book as a reference with the workshop as a good introduction for its use." – San Ramon participant

"More time for the interaction and discussion afterwards." - Vallejo participant

"The site plan exercise needed more time - at least 2 to 3 hours." - San Ramon participant

"The book is great. Workshop was more useful than I would have expected - got some novel ideas." – San Francisco participant

"For conceptual, the workshop was fine. For regulations and enforcement it was weak." - Vallejo participant

"Excellent, dynamic presentation with practical slides." – Fremont participant

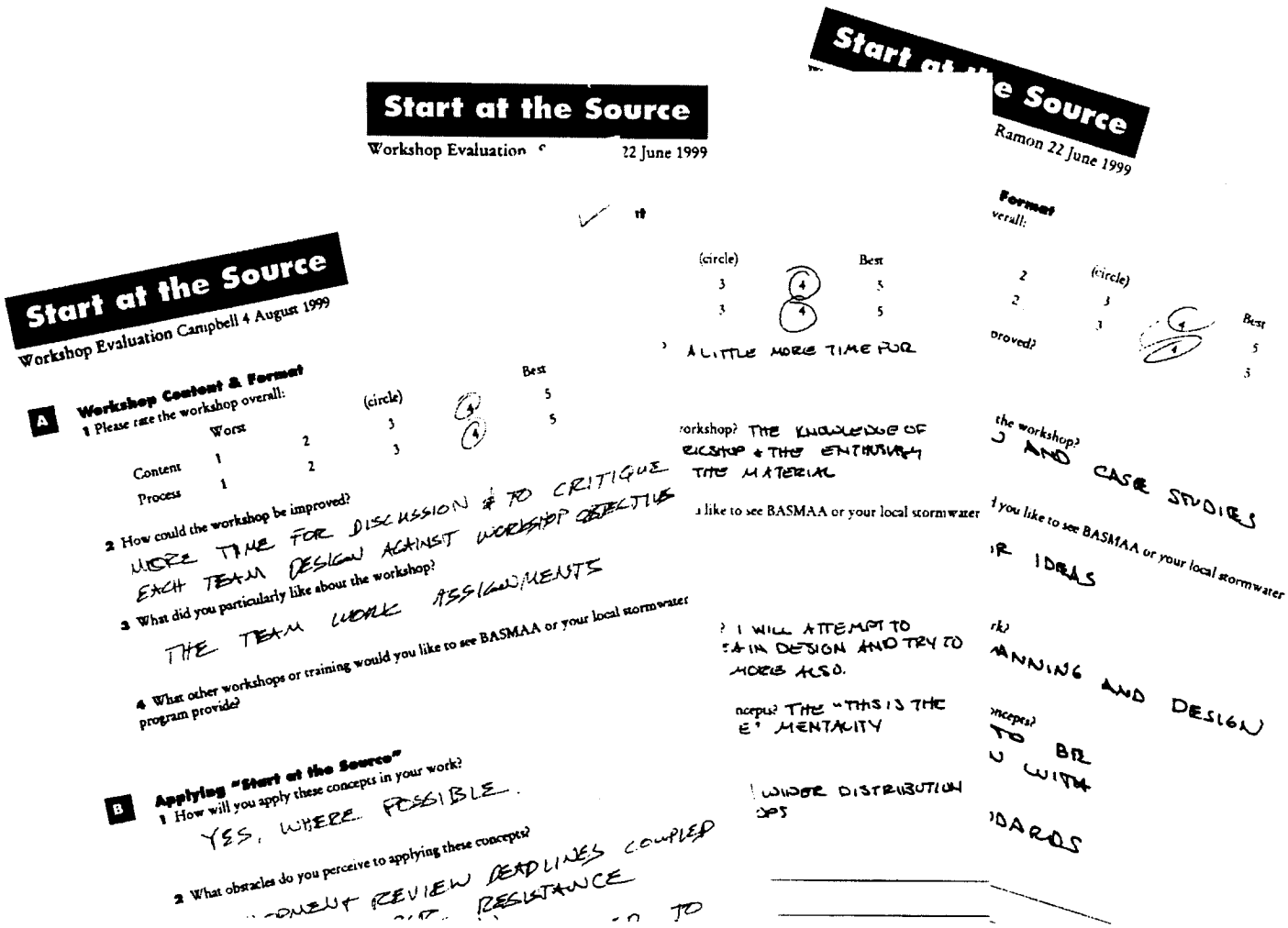
"Paced well, lots of visual, local examples." – Fremont participant

"Less introduction and comments from Regional Board. Spend more on examples and exercise and going over the book." – Belmont participant

"Slightly more evaluation of methods, e.g., advantages/ disadvantages of swales - when useful, when not" - San Ramon participant

Difficulties

The workshops themselves had few difficulties, though better coordination of room layout would improve the efficiency with set up. The rooms varied greatly between sites: the room layout, size and number of tables, and quality of light. In one case (Fremont) the reserved room was not available, and the workshop had to move at the last minute, delaying the start time and overcrowding the tables. Not knowing the room layout ahead of time was problematic because it was difficult to prepare the mate-



rials to accommodate the room. Also, wide rooms and rooms with poor light control made the slides difficult for all participants to view clearly.

Because the workshops were free-of-charge, there was a relatively high percentage of no-shows, and many walk-ins. This made it difficult to get an accurate count of participants beforehand, which would have been helpful in preparing the workshop materials and ensuring an appropriate mix of participants at each table for the hands-on exercise. As a result, the amount of materials could not be accurately estimated, participants were required to shuffle to fill tables, most workshops had extra food and it was hard to anticipate optimal staffing levels. For the July 15 Vallejo workshop, we emailed a reminder notice to registrants, which resulted in full participation.

Participants indicated that they found the content valuable and the presentation well-organized and well-paced, though some indicated a desire for a longer workshop and more time for the hands-on exercise. The comments from the evaluation forms seemed to indicate that the slides and examples of Bay Area case studies showing what works and what doesn't were well-received. This was an improvement over the 1997 Outreach Workshops.

The most consistent difficulty was attracting developers and policy makers. It is important to reach these groups because they have a central role in the decision-making process, and their absence is noted and perceived by the participants as an obstacle to applying the concepts presented in the Manual.

National Impact

Recognition. Since the first version of Start at the Source was published, the Manual has been recognized by two awards — the American Society of Landscape Architects (ASLA) Award for Communication (1997), and the Friends of the San Francisco Estuary's Outstanding Comprehensive Conservation Management Plan (CCMP) Implementation Project Award (1999).

Tom Richman & Associates has received calls from design professionals and public works officials from many regions requesting additional workshops, copies of the Manual, or requesting information about its content.

Distribution. In the Bay Area, the Manual will be distributed to the public sector by BASMAA and its participating programs. For the private sector, and other nationwide distribution, BASMAA has entered into an agreement with Forbes Custom Publishing, Inc. to print and distribute the Manual. Forbes participation makes obtaining the Manual significantly more for more convenient.

Next Steps

Additional workshops. The workshops have been a very successful means of introducing the Manual, and additional offerings are likely to be successful. Other organizations, such as the Local Government Commission, League of California Cities, Urban Land Institute, Home Builders Association, American Society of Landscape Architects, and the American Planning Association may be willing to sponsor additional workshops. Unlike the first round of workshops, which were free to participants, these could be on a fee basis. In addition to covering the cost of putting on the workshop, a fee may encourage people to make a greater commitment to the workshop – if they invest money in it, they are more likely to attend and more highly value the material.

Companion workshops. The evaluation response indicated a strong interest in having on-site workshops, in which the group would tour Bay Area sites to see built examples of post-construction controls and discuss in more detail what has been successful and what has failed. This could be designed so that developers and key municipal participants meet with the group to discuss various issues. It could also be designed as a walking/driving tour that could be done independently and at one's own pace.

Video. The absence of policymakers was noted by workshop participants. BASMAA could create a short video that would be convenient for a local stormwater representative to show to city councils or planning commissions as part of a regular agenda or study session. In this way, BASMAA can reach those who are too busy to attend a half-day workshop on the subject.

Conclusion

Overall, the outreach program achieved its purposes.

Workshop participants got a dynamic, thorough introduction to the manual, and had an opportunity to use it in a design exercise, modeling behavior they will use in their daily professional work. A significant number of "change agents" have now been seeded throughout the Bay Area who have a hands-on introduction to the Manual, are enthusiastic about it, and have commented on how they will apply these concepts in their work.

The outreach program also provided an opportunity for participants to build interdisciplinary relationships and share information on designing for stormwater quality. The document and the workshops increased the visibility and credibility of BASMAA and the regional stormwater programs. They also laid the foundation for additional related documentation and outreach efforts.

In these ways, the 1999 edition of *Start at the Source* and its companion workshops built on the successes of the previous version as well as other BASMAA programs to be a significant step towards improving regional water quality.

R0070620

Appendix 1 - Attendance

Start at the Source

Workshop Attendance: 17 June 1999 Belmont

Name	Affiliation	Address	City	Zip	Phone	Email
Abbott , Adrienne	Golden Gate National Park	Building 201, Fort Mason	San Francisco		415 561.4843	
Anderson , Erik	City of Mountain View	100 Villa Street	Mountain View		650 903.6378	
Anderson , Terilyn	Wastewater Superintendent	1017 Middlefield Road	Redwood City	94065	650 780-7477	TAnderson@redwoodcity.org
Aozasa , Lisa	San Mateo County Planning	455 County Center, 2nd	Redwood City	94063	650 363-4852	
Bortolussi , Sara	San Mateo County Planning	455 County Center, 2nd	Redwood City	94063	650 363-1839	sara_bortolussi@hotmail.com
Brosseau , Geoff	BASMAA	518 Central Ave	Menlo Park	94025	650 322-3070	
Cox , Janet	City of Palo Alto	1741 Cowper St.	Palo Alto	94301	650 321-3070	Roosters@batnet.com
Davidson , Bob	San Mateo County STOPPP	310 Capstan Court	Redwood City	94065	650 593.3820	RDavid1535@aol.com
Didonato , Damon	San Mateo County Planning	455 County Center	Redwood City	94063	650 363-1852	
Donguines , Ray	City of Pacifica Engineering	170 Santa Maria Avenue	Pacifica	94044	650 738 3767	
Dorais , Norman	City of Foster City	610 Foster City Blvd.	Foster City		415 286-3279	
Edde , Wendy	EOA, Inc.	1410 Jackson Street	Oakland	94612	510 832-2852	
Edwards , Bob	City of San Mateo	2050 Detroit Drive	San Mateo	94404	650 522.7342	
Engleston , Brad	City of Palo Alto	250 Hamilton Ave.	Palo Alto	94301	650 329.2430	
Felch , John	Mission Peak Construction	245 Sinclair	Milpitas	95035	408 934.7180	
Fox , Nicole	Golden Gate Naional Park	1441 6th Avenue (home	Belmont	94022	650 631.1934	
Hope , Ari	Hope Architects	328 Rutledge Street	San Francisco	94110	415 821 3221	
Jagelski , Janice	City of Burlingame	501 Primrose	Burlingame	94010	650 696-7230	
Langman , Jeff	Environmental Science Assoc	225 Bush Street, Suite 1700	San Francisco	94104	415 896-5900	jlangman@esassoc.com
Leong , Terry	Town of Hillsborough	1600 Floribunda	Hillsborough	94010	650 373.7411	
Lin , Brian	Callander Associates	311 Seventh Ave	San Mateo	94401	375-1313	blin@callanderassociates.com
Mao , Shaun	City of Menlo Park	701 Laurel Street	Menlo Park	94025	415 858-3423	
McKinney , Roberta	City of Pacifica Engineering	170 Santa Maria Avenue	Pacifica	94044	650 738 7341	
Mion , Karen	County of San Mateo Public Wks	10 Twin Dolphin Drive,	Redwood City	94065	650 599.1410	pw*kmion@co.sanmateo.ca.us
Mortazavi , Farhad	San Mateo County				650 325.1831	
Muehlhausen , David	City of San Carlos	600 Elm Street	San Carlos	94401	650 802-4332	
Mumley , Tom	Regional Water Quality Cntrl Brd	1515 Clay Street, 14th Floor	Oakland	94612	510 622.2396	
Obregon , Lisa	City of San Jose Planning	801 North First Street,	San Jose	95110	408 277-4576	lisa.obregon.ring@ci.sj.ca.us
Padovan , Steve	City of San Bruno	567 El Camino Real	San Bruno		650 877-8874	spadovan@ci.sanbruno.ca.us

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Start at the Source

Workshop Attendance: 17 June 1999 Belmont

Name	Affiliation	Address	City	Zip	Phone	Email
Poetsch , Rob	Town of Woodside	P.O. Box 620005	Woodside	94062	650 851-6796	rpoetsch@woodsidetown.org
Refvem , Sharon	Hawley, Peterson & Snyder	100 View St., Suite 100	Mountain View	94041	650 968-2944	srefvem@hpsarch.com
Rose , Anna	Hawley, Peterson & Snyder	100 View St., Suite 100	Mountain View	94041		
Rosenstrom , Bud	Ryder Homes	1425 Treat Boulevard	Walnut Creek	94596	925 937.4373	
Russell , Sandy	City of Belmont	1070 6th Ave.	Belmont		415 595-7440	
Shires , Ann	City of Millbrae	621 Magnolia Ave.	Millbrae	94030	650 259-2341	ashires@ci.millbrae.ca.us
Spencer , Raymond	Regional Board, San Francisco Bay	1515 Clay Street, 14th Floor	Okland	94612	510 622.2397	
Stewart , Jim	City of Palo Alto	250 Hamilton Ave.	Palo Alto	94301	650 329.2430	
Sue , Lowell	City of Redwood City	1017 Middlefield Road, PO	Redwood City	94064	650 780.7369	
Teresi , Joe	City of Palo Alto	250 Hamilton Ave.	Palo Alto	94301	415 329-2129	joe_teresi@city.palo-alto.ca.u
Walton , Annette	Stanford Management Company	2770 Sand Hill Road	Menlo Park	94025	650 926 0224	
Wilson , Grant	San Bruno Planning Dept.	567 El Camino Real	San Bruno		650 877-8874	gwilson@ci.sanbruno.ca.us
Worden , Sam	Shapel Industries	100 Milpitas Boulevard	Milpitas	95035	408 9461550	
Zhu , Stanley	City of Redwood City	1017 Middlefield Road, PO	Redwood City	94064	650 780.7369	

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Start at the Source

Workshop Attendance: 22 June 1999 San Ramon

Name	Affiliation	Address	City	Zip	Phone	Email
Akiyama , Bob	City of Piedmont	120 Vista Ave.	Piedmont	94611	510 420-3050	rakiyama@ci.piedmont.ca.us
Aminian , Saied	City of Dublin	100 Civic Center, P. O. Box	Dublin	94568	925 833-6632	
Andrade , Rod	MacKay & Somps	5142 Franklin Dr. #C	Pleasanton	94588		randrade@msce.com
Andrews , Jacqueline	City of Livermore	3589 Pacific Avenue	Livermore	94550	650 373-5250	
Banuelos , Tim	Byrens Associates	361 17th Street	Oakland	94612	510 452-3224	byrens@dnai.com
Barron , Hector	City of Modesto	P.O. Box 642	Modesto	95351	209 571-5181	hbarron@ci.modesto.ca.us
Barrozo , Lourdes	City of Oakland	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-4792	
Byde , Andy	City of Dublin	100 Civic Center, P. O. Box	Dublin	94568	925 833-6610	abyde@netscape.net
Byrens , Dave	Byrens Associates	361 17th Street	Oakland	94612	510 452-3224	byrens@dnai.com
Cheng , Grace	Regional Water Quality Cntrl.Bd.	1515 Clay Street, 14th Floor	Okland	94612	510 622.2505	stu13@rb2.swrcb.ca.gov
Conner , Rick	Nuvis	5 Crow Canyon Court,	San Ramon		925 820.2771	
Cruz , Bennett	City of San Leandro	835 E. 14th Street	San Leandro	94577	510 577-3429	bcruz@ci.san-leandro.ca.us
DeLaTorre , Keith	City of Pleasant Hill	310 Civic Drive	Pleasant Hill	94523	925 671.4656	
Dhaliwal , Jagtar	City of Berkeley Planning	2120 Milvia Street	Berkeley	94704	510 644-6555	Jad4@ci.berkeley.ca.us
Dopson , A. D.	City of Dublin	100 Civic Center, P. O. Box	Dublin	94568	925 833-6639	
Fanuncio , Jim	City of Hayward	777 B Street	Hayward		510 583.4786	
Farias , Linus	Contra Costa Co. Clean Water Prg.	255 Glacier Dr.	Martinez	94553	925 313-2364	lfarias@pw.co.contra-costa.ca.
Feldkamp , Mark	City of Piedmont	120 Vista Ave.	Piedmont	94611	510 420-3050	mfeldkamp@ci.piedmont.ca.us
Gandesbery , Tom	Regional Board, San Francisco Bay	1515 Clay Street, 14th Floor	Okland	94612	510 622.2348	trg@rb2.swrcb.ca.gov
Gangapuram , Avanindra	City of Pittsburg	65 Civic Ave.	Pittsburg	94565	925 439-4920	avan123@yahoo.com
Govers , John	Govers Engineers	3708 Mt. DIablo Blvd #100	Lafayette	94549		
Grubstick , Philip	City of Oakland	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-4792	pagrubstick@oaklandnet.com
Hagen , Aimee	David Evans & Associates	5000 Executive Parkway	San Ramon	94583	925 867-3380	glpa@deainc.com
Hugens , Kathy	HDK Associates	315 Diablo Road, Suite 214	Danville	94526	925 838.5869	
Kalkowski , Buzz	City of Dublin	100 Civic Center, P. O. Box	Dublin	94568	925 833-6610	
Kohut-Franke , Annie	Alameda County Public Works	951 Turner Ct., Room 100	Hayward	94545	510 670-5259	bill@acpwa.mail.co.alameda.ca.us
Latimer , Brian	City of Pleasanton	PO Box 520	Pleasanton	94566	510 484-8065	
Lau , Chris	City of Montesereno	609 Gregory Lane Suite 200	Pleasant Hill	94523	925 256-7601	clau@willdan.com
Lyon , Ashleigh	City of Piedmont	120 Vista Ave.	Piedmont	94611	510 420-3050	alyon@ci.piedmont.ca.us

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Start at the Source

Workshop Attendance: 22 June 1999 San Ramon

Name	Affiliation	Address	City	Zip	Phone	Email
Lyons, Jaimie	City of Piedmont	120 Vista Ave.	Piedmont	94611	510 420-3050	jlyons@ci.piedmont.ca.us
Miller, Gregg	Carlson, Barbee & Gibson	2000 Crow Canyon Road,	San Ramon		925 866.0322	
Moore, Michael	City of Pleasant Hill	310 Civic Drive	Pleasant Hill	94523	925 671.4656	
Musonge, Martin	Regional Water Quality Cntrl. Brd.	1515 Clay Street, 14th Floor	Okland	94612	510 622.2396	mym@rb2.swrcb.ca.gov
Nakahara, Chester	City of Piedmont	120 Vista Ave.	Piedmont	94611	420-3050	cnakahara@ci.piedmont.ca.us
Osalbo, Jun	City of Oakland	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-3235	fosalbo@oakland.com
Osterhout, Gary	MacKay & Somps				925 225.0690	
Palffy, Andrew D.	dk Associates, Inc.	1440 Maria Lane, Suite 200	Walnut Creek	94596	925 932-6868	dkassoc@jps.net
Parco, Gerry L.	David Evans & Associates	5000 Executive Parkway	San Ramon	94583	925 867-3380	glpa@deainc.com
Perkins, Rinta	City of Walnut Creek	PO Box 8039	Walnut Creek	94596	925 943-5834	perkins@ci.walnut-creek.ca.us
Phillips, Dean	City of Modesto	P.O. Box 642	Modesto	95351	209 577-5260	tigger@cableone.net
Pierce, Diane	Alameda County Clean Water Brd.	951 Turner Court	Hayward	94545	510 670-5529	diane@acpwa.mail.co.alameda.ca.us
Raschke, Matthew A.	Brian Kangas Foulk	2737 North Main Street, Ste	Walnut Creek	94596	925 940-2224	mraschke@bkf.com
Rocha, Jesse	City of Pleasant Hill	310 Civic Drive	Pleasant Hill	94523	925 671.4656	
Rolle, Donna	Alameda County Public Works	951 Turner Ct., Room 100	Hayward	94545	510 670-5259	bill@acpwa.mail.co.alameda.ca.us
Romain, Billi	S.F. Estuary Project	1202 Curtis St	Berkeley	94706	510 527-7654	billir@earthlink.net
Ross, Ken	City of Livermore	3589 Pacific Avenue	Livermore	94550	925 373-5454	engineering@ci.livermore.ca.us
Sadghiani, Bahram	MacKay & Somps				925 225.0690	
Salamack, Lori	City of Piedmont	120 Vista Ave.	Piedmont	94611	510 420-3050	lsalamack@ci.piedmont.ca.us
Salgado, Debbie	City of Livermore	3589 Pacific Avenue	Livermore	94550	925 373-5225	desalgado@ci.livermore.ca.us
Sawrey-Kubicek, Phil	Alameda County Comm. Dev.	399 Elmhurst Street	Hayward	94563	510 670-5400	p.sawrey-kubicek@excite.com
Seils, Sharon	City of Los Gatos	101 Avocado Court	San Ramon	94583	925 256-7601	sharon@trinnet.net
Shapiro, Neal	City of Santa Monica	1685 Main Street, P.O. Box	Santa Monica	90407	310 458-8223	neal-shapiro@ci.santa-monica.ca.us
Sidhu, Harjit	City of Livermore	3589 Pacific Avenue	Livermore	94550	925 373-5261	engineering@ci.livermore.ca.us
Skinner, Jeff	City of Pleasant Hill	310 Civic Drive	Pleasant Hill	94523	925 671.4656	
Slick, Rachel	City of Walnut Creek	PO Box 8039	Walnut Creek	94596	925 943-5827	slick@ci.walnut-creek.ca.us
Struve, Mori	City of El Cerrito	10890 San Pablo Ave	El Cerrito	94530	510 215-4367	
Thrailkill, Mark	City of Livermore	3589 Pacific Ave.	Livermore	95550	925 373-5240	
Threde, Michael R.	dk Associates, Inc.	1440 Maria Lane, Suite 200	Walnut Creek	94596	925 932-6868	dkassoc@jps.net

R0070625

Start at the Source

Workshop Attendance: 22 June 1999 San Ramon

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Tompson , Linda	Nuvis	5 Crow Canyon Court,	San Ramon		925 820.2771	
Tompson , Linda	Nuvis	5 Crow Canyon Court,	San Ramon		925 820.2771	
Tucker , Tim	City of Walnut Creek	PO Box 8039	Walnut Creek	94596	925 943-5826	tucker@ci.walnut-creek.ca.us
Ulrich , Arden	Govers Engineers	3708 Mt. Diablo Blvd. #100	Lafayette	94549		
Van Katwyck , Kevin	City of Dublin	100 Civic Center, P. O. Box	Dublin	94568	925 833-6639	
Vingo , James S.	City of Livermore	3589 Pacific Avenue	Livermore	94550	925 373-5255	jsvingo@ci.livermore.ca.us
Woods , Mark	David Evans & Associates	5000 Executive Parkway	San Ramon	94583	925 867-3380	
Yowakim , Khalil	City of Livermore	3589 Pacific Avenue	Livermore	94550	925 373-5258	

R0070626

Start at the Source

Workshop Attendance: 24 June 1999 Fremont

Name	Affiliation	Address	City	Zip	Phone	Email
Ackerman, Jennifer	Regional Water Quality Cntrl. Brd.	1515 Clay Street, 14th Floor	Okland	94612	510 622.2346	stu22@rb2.swrcb.ca.gov
Aguiar, Steve	City of Livermore	101 W. Jack London Blvd	Livermore		925 373-5233	
Akagi, Daniel M.	City of Berkeley	2201 Dwight Way	Berkeley	94704	510 665-3409	daa2@ci.berkeley.ca.us
Anderson, Robert B.	City of Fremont	39550 Liberty Street	Fremont	94537		
Bondurant, Julie	Amphion	1330 Broadway, Suite 300	Oakland	94612	510 893.9888	
Carino, Melissa	City of Union City	2736 Killdeer Court	Union City	94587	510 354-8824	mmcarino@aol.com
DeRienzo, Dominick	City of Fremont	39550 Liberty Street	Fremont	94537	510 494-4529	
Estrada, Teresa	City of San Jose Planning	801 North First Street,	San Jose	95110	408 277-4576	teresa.estrada@ci.sj.ca.us
Evans, Amy	Alameda Co. Resource District	1996 Holmes Street	Livermore	94550	925 371.0154	
Fagot, Soren	City of Newark	3761 Newark Blvd.	Newark		510 790-7286	
Fiske, Meghan	Ron Herman Landscape Architect	261 Joaquin Ave.	San Leandro	94577	510 352-4920	RHermanLA@aol.com
Garcia, Jaime	City of Milpitas	455 E. Calaveras Blvd.	Milpitas	95035	408 586.3351	
Gilli, Peter	City of San Jose Planning	801 North First Street,	San Jose	95110	408 277-4576	Peter.Gilli@ci.sj.ca.us
Gottiparthy, Nanda	City of San Leandro	835 East 14th Street	San Leandr	94577	510 577-3439	ngottiparthy@ci.san-leandro.ca
Greenwood, Darren	City of Livermore	101 W. Jack London Blvd	Livermore		925 373-5233	darreng@ci.livermore.ca.us
Harbin, Janet	City of Fremont	39550 Liberty Street	Fremont	94537	510 494.4438	
Howard, Carl	City of Union City	34009 Alvarado-Niles Rd.	Union CIty	94587	510 471-3232	
Huang, Judy C.	Regional Board, San Francisco Bay	1515 Clay Street, 14th Floor	Okland	94612	510 622.2363	jch@rb2.swrcb.ca.gov
Ilano, Eli	Regional Water Quality Control	2225 10th St.	Berkeley	94710	510 848-5302	eilano@uclink4.berkeley.edu
Jost, Wes	City of Pleasanton	PO Box 520	Pleasanton	94566	510 484-8049	wsjost@ci.pleasanton.ca.us
Kim, Deborah	City of San Jose Planning	801 North First Street,	San Jose	95110	408 277-4576	deborah.kim@ci.sj.ca.us
Lear, Jim	City of Hayward	777 B Street	Hayward	94541	510 583-4786	jimf@ci.hayward.ca.us
McLaughlin, Laura	Student: UC Berkeley	1923 Dwight Way	Berkeley	94704	510 649-8695	LAMcLaughlin@lbl.gov
Meda, Venkat	City of San Leandro	835 East 14th Street	835 East 14th St.	94577	510 577-3471	vmeda@ci.san-leandro.ca.us
Medina, Robert	City of Palo Alto	250 Hamilton Ave.	Palo Alto	94301	650 329.2430	
Meerjans, Barbara	City of Fremont	39550 Liberty St.	Fremont	94537	510 494-4718	bmeerjans@ci.fremont.ca.us
Moughon, Mitch	City of Fremont	39550 Liberty St.	Fremont		510 494-4730	
Nafziger, Mike	City of Palo Alto	250 Hamilton Ave.	Palo Alto	94301	650 617-3103	
Newton, Paul	City of Fremont Landscape Arch.	39550 Liberty St.	Fremont		510 494-4718	

R00070627

Start at the Source

Workshop Attendance: 24 June 1999 Fremont

Name	Affiliation	Address	City	Zip	Phone	Email
Prisco, Mary	City of Fremont	PO Box 5006	Fremont	94537	510 494-4687	mprisco@ci.fremont.ca.us
Raaymakers, John	City of San Jose	801 N. First St., Room 308	San Jose	95110	408 277-5161	john.raaymakers@ci.sj.ca.us
Reyes, Roberto	City of Fremont	39550 Liberty St.	Fremont		510 494-4718	
Richmond, Gary	Ron Herman Landscape Architect	261 Joaquin Ave.	San Leandro	94577	510 352-4920	RHermanLA@aol.com
Rosenstadt, Roger	City of Fremont Planning	39550 Liberty St.	Fremont		510 494-4718	
Satterlee, Denise	City of Milpitas Fire Dept.	455 E. Calaveras Blvd	Milpitas	95050	408 586-3378	
Scanlin, James	Alameda County Public Works	951 Turner Ct., Room 100	Hayward	94545	510 670-6548	jims@acpwa.mail.co.alameda.ca.us
Schwob, Jeff	City of Fremont	39550 Liberty St.	Fremont		510 494-4527	
Stella, Michael	City of Fremont	39550 Liberty Street	Fremont	94537	510 494-4472	mstella@ci.fremont.ca.us
Swardenski, Jay	City of Union City	33001 Alvarado Niles Rd	Union City		510 471-1424	
Thomas, Jerry	City of Alameda	950 W. Mall Square,	Alameda		510 749.5857	
Timothy, Laura	City of Alameda	950 W. Mall Square,	Alameda		510 749.5857	
Tran, Phuong	City of San Jose	801 N. 1st Street, Room 308	San Jose	95110	408 277-5161	phuong.tran@ci.sj.ca.us
Trinidad, Jr., Domingo	City of San Jose	801 N. First St., Room 308	San Jose	95110	408 277-5161	domingo.trinidad@ci.sj.ca.us
Tupper, Gayle	City of Hayward	24499 Soto Road	Hayward	94544	510 881.7993	
Valenti, Veronica	City of Milpitas	455 E. Calaveras Blvd.	Milpitas	95035	408 586.3351	
Wong, Darryl	City of Milpitas	455 E. Calaveras Blvd	Milpitas	95050	586-3345	Dwong@ci.milpitas.ca.gov
Wong, Terry	City of Fremont				510 494.4456	
Zeisbrich, Dean	City of San Jose	801 N. 1st Street, Room 308	San Jose	95110	408 277-5161	dean.zeisbrich@ci.sj.ca.us

R0070628

Workshop Attendance: 29 June 1999 Marin

Name	Affiliation	Address	City	Zip	Phone	Email
Black, David	City of Mill Valley	P.O.Box 1029	Mill Valley	94942	415 383-6020	dblack@cityofmillvalley.org
Bleifuss, Alistair	Council of Bay Area Resource	PO Box 125	Bogeda	94922	707 876-1806	
Burke, Thomas	Hydrologic Systems	433 Town Center, Suite 503	Corte Madera	94925	415 927-3726	h2o@engineer.com
Carlson, Steve	City of South San Francisco	315 Maple Avenue	S. San Francisco	94080	650 877-8535	scarlson@ecd.ci.ssf.ca.us
Collopy, Susan	City of Larpspur Public Works	400 Magnolia	Larkspur	94939	415 927.5028	
D'Arppino, Tony	Matterhorn California	800 School Street, Suite C	Napa	94559	707 265.9490	
Davis, Gail	Santa Rosa Permit & Resource Dpt	2550 Ventura Avenue	Santa Rosa	95401	707 527.1907	
Dunn, Elizabeth	City of Petaluma	11 English Street	Petaluma	94952	707 778.4301	
Estes, Lesley	City of Oakland	250 Frank H. Ogawa Plaza,	Oakland	94612	510 238-7431	lcestes@oaklandnet.com
Fox, Andrea	Marin County Community Dev.	3501 Civic Center Drive,	San Rafael	94903	415 499-6281	afox@marin.org
Fredrickson, Lewis	City of Novato	900 Sherman Avenue	Novato	94945	415 89893.7928	
French, Amy	City of Palo Alto	PO Box 10250, 250	Palo Alto	94303	650 329-2209	frenchamy@hotmail.com
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Guidice, Alicia	County of Marin				415 499.3649	
Hansen, Kim	Marin County Planning Dept.	3501 Civic Center Drive,	San Rafael	94903	415 499-6292	tlai@marin.org
Harmon, Richard	City of South San Francisco	315 Maple Avenue	S. San Francisco	94080	650 829-6652	
Hathaway, Kristin	City of Oakland	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-7571	khathaway@oaklandnet.com
Herman, Mike	CSW/Stuber-Stroeh	790 De Long Avenue	Novato	94945	415 892-4763	mikeh@cswst2.com
Hinds, Alex	County of Marin Planning Dept.	3501 Civic Center Drive,	San Rafael	94903	415 499-6292	tlai@marin.org
Hinkle, Micah	City of San Rafael	1400 5th Ave.	San Rafael	94901	415 485-3085	micah@metro.net
Honan, Ray	City of South San Francisco	315 Maple Avenue	S. San Francisco	94080	650 877-8535	scarlson@ecd.ci.ssf.ca.us
Lieberman, Judy	City of Albany	1000 San Pablo Avenue	Albany	94706	510 528-5766	commdev@ix.netcom.com
Matthews, Marcie	CSW/Stuber-Stroeh	790 De Long Avenue	Novato	94945	415 892-4763	marciem@cswst2.com
Montero, David	Town of Corte Madera	PO Box 159	Corte Madera	94925	415 927-5037	
Neville, John		PO Box 4186	San Rafael	94913	415 499-6549	
Nutt, Jason	Marin County Flood Control	P.O. Box 4186	San Rafael	94913	415 499-7137	jnutt@marin.org
Parsons, Dean	City of San Rafael	1400 5th Ave.	San Rafael	94901	415 485-3094	
Patterson, Louise	City of San Rafael	1400 5th Ave.	San Rafael	94901	415 485-3095	
Sanchez, Lily	EOA, Inc.	1410 Jackson Street	Oakland	94612	510 832-2852	

R00070629

Start at the Source

Workshop Attendance: 29 June 1999 Marin

Name	Affiliation	Address	City	Zip	Phone	Email
Schwarz, Ali	City of Oakland	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-7074	aschwarz@oaklandnet.com
Stanley, Jennifer	City of Oakland Public Works	250 Frank H. Ogawa Plaza,	Oakland	94612	510 238-6889	jstanley@oaklandnet.com
Stickley, Kate	Veragates, Landscape Architects	109 Bartlett Street	San Francisco	94110	415 285.4301	
Strem, Charlotte	U.C. Office of the President	1111 Franklin St, 6th Floor	Oakland	94607	510 987-0113	charlotte.strem@ucop.edu
Toft, Neal	City of Sausalito	420 Litho Street	Sausalito		415 289-4129	
Tuikka, BIll	City of San Rafael	1400 5th Ave.	San Rafael	94901	415 485-3085	
Tzifas, Peter	City of Sausalito	420 Litho Street	Sausalito		415 289-4129	
Wagner, Adam	Miller Company	1585 Folsom Street	San Francisco	94103	415 252-7288	awagner@millercomp.com
Weinsoff, David	Town of Fairfax	138 Ridgeway Avenue	Fairfax	94930	415 460.9760	weinsoff@ix.netcom.com
Wooley, John	Marin Co. Flood Control	P.O. Box 4186	San Rafael	94913	415 499-6532	
Zeiger, Steven	City of San Rafael	PO Box 151560	San Rafael	94715	415 485-3435	steve.zeiger@ci.san-rafael.ca.

R0070630

Workshop Attendance: 30 June 1999 San Francisco

Name	Affiliation	Address	City	Zip	Phone	Email
Abejo, Frank	City of Orinda	PO Box 2000	Orinda	94563	925 253.4261	
Arden, Betsy	San Mateo County Planner	455 County Center	Redwood City	94063	650 363-1829	earden@co.sanmateo.ca.us
Asche, Lisa	Alameda County Planning	224 W. Winton Ave., #151	Hayward	94544	510 670-6515	elatad@flash.net
Avila, Kim	EIP Associates	601 Montgomery Street,	San Francisco	94111	415 362.1500	
Balderama, Maria	City of San Jose	801 N. 1st Street, # 308	San Jose	95110	408 277-5161	simeon.mercado@ci.sj.ca.us
Berglund, Kris	Landscape Architect	5124 Proctor Avenue	Oakland	94618	510 654.7052	
Bessen, Vern	City of San Mateo	2050 Detroit Drive	San Mateo	94404	650 522.7342	
Boyle, Chris	DES Architects	399 Bradford	Redwood City	94063	650 364-6453	CBOYLE@DES-AE.COM
Bressanutti, Ricardo	City of Oakland Zoning Division	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-6417	rbressanutti@oaklandnet.com
Brosseau, Geoff	BASMAA	518 Central Ave	Menlo Park	94025	650 322-3070	
Chan, Susanna	City of Concord	1957 Parkside Drive	Concord	94519	925 671-3137	schan@ci.concord.ca.us
Cheung, Ron	Orsee Design Associates	841 The Alameda, Ste. 200	San Jose		408 283-2199	ODASJ@AOL.COM
Chi, Stanley	City of Oakland	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-2262	schi@oaklandnet.com
Davis, Floyd	City of Dublin	P. O. Box 2340	Dublin	94568	925 833-6634	
El-Telbany, Angela	San Pablo Community Dev. Dept.	13831 San Pablo Avenue	san Pablo	94806	510 215.3000	
Feyerabend, Barbara	Feyerabend & Madden	3945 Opal Street	Oakland	94609	510 450.0803	
Finney, Jon	Brian Kangas Foulk	540 Price Ave	Redwood City		415 482-6422	jfinney@bkf.com
Gallo, Robert	City of Sunnyvale	1444 Borregas Ave.	Sunnyvale	94088	408 730-7737	rgallo@ci.sunnyvale.ca.us
Gardiner, Kevin	Malcolm Carpenter Associates	1190 El Camino Real	Colma	94014	650 985-2590	MCAPlanner@aol.com
Gee, Ronald	Alameda County Planning Dept.	399 Elmhurst Street, # 136	Hayward	94544	510 670-5410	rgee@co.alameda.ca.us
Gill, Elisa C.	RWQCB-San Francisco Bay Reg.	6016 Harwood Avenue	Oakland	94612	510 6601-1579	
Jilwan, Emile Y.	Bay Area Rapid Transit (BART)	979 Broadway Avenue	Millbrae	94030	650 689-8395	ejilwan@bart.gov
Johnson, Bill	EIP Associates	601 Montgomery St., #500	San Francisco	94111	415 362.1500	
Kao, Yi-Liang	Orsee Design Associates	401 Terry Francois St. 200	San Francisco	94107	415 957.9833	ODASJ@AOL.COM
Kent, Nancy	David Thorne Landscape Architect	3315 Grand Avenue	Oakland	94610	510 451 6161	
Kilgour, Laura	Alameda County Flood Control	951 Turner Ct., Room 300	Hayward	94545	510 670-6479	laura@acpwa.mail.co.alameda.ca.us
Lim, Gary M.	City of Oakland	250 Frank H. Ogawa Plaza	Oakland	94612	510 238-2262	glim@oaklandnet.com
Madden, Georgia	Feyerabend & Madden	3945 Opal Street	Oakland	94609	510 450.0803	
Marshall, Jill	Regional Water Qualitiy Control	1515 Clay Street, 14th Fl.	Okland	94612	510 622.2388	jm@rb2.swrcb.ca.gov

R0070631

Workshop Attendance: 30 June 1999 San Francisco

Name	Affiliation	Address	City	Zip	Phone	Email
Medwin, Josh	Brian Kangas Foulk	540 Price Ave.	Redwood City		650 482-6315	jmedwin@bkf.com
Mendoza, Justiniano R	Noni Mendoza Associates	601 Van Ness Ave.# E3438	San Francisco	94102	415 931-1484	jmenj@pacbell.net
Nakamura, Bill	San Francisco Redevelopment	770 Golden Gate Avenue	San Francisco	94102	415 749.2447	
Olson, Barrett	Amphion Environmental, Inc.	1330 Broadway, Suite 300	Oakland	94612	510 893.9888	amphion@value.net
Owens, Bradley		385-B East Kingsley Ave.	Pomona	91767	909 620-4979	bbowens@csupomona.edu
Paul, B. K.	Earthquake and Structures (ESI)	6355 Telegraph Ave, #101	Oakland	94609	510 601-1065	bkpesi@aol.com
Pierce, Diane	Alameda County Clean Water Brd.	951 Turner Court	Hayward	94545	510 670-5529	diane@acpwa.mail.co.alameda.ca.us
Pulver, Elizabeth	David Thorne Landscape Architect	3315 Grand Avenue	Oakland	94610	510 451 6161	
Robinson, Margaret	Regional Board, San Francisco Bay	1515 Clay Street, 14th Fl.	Okland	94612	510 622.2415	stu13@rb2.swrcb.ca.gov
Soungpanya, Leck	City of San Pablo	1 Alvarado Square	San Pablo	94806	510 215.3067	
Southard, Bill	DES Architects	399 Bradford St.	Redwood City	94063	650 364-6453	bsouthard@des-ae.com
Thompson, Laura	San Mateo County Planning Dept.	455 County Center, 2nd Fl.	Redwood City	94063	650 363-1828	lthompson@co.sanmateo.ca.us
Tomlin, Phillip	City of Modesto	1221 Sutter Ave	Modesto	95351	209 577-6382	ptomlin@ci.modesto.ca.us
Tune, Tim	City of Brisbane	50 Park Lane	Brisbane	94005	415 508.2120	
Turpin, Tami	Alameda County Public Works	951 Turner Ct., Room 300	Hayward	94545	510 670-6479	tami@acpwa.mail.co.alameda.ca.us
Tyndall, Kristy	Public Affairs Managment	101 The Embarcadero, #210	San Francisco	94105	415 989-1446	k.tyndall@pamsf.com
Wycko, Bill	San Francisco Planning Department	1660 Mission	San Francisco	94103	415 558.6294	

R0070632

Workshop Attendance: 15 July 1999 Vallejo

Name	Affiliation	Address	City	Zip	Phone	Email
Aghamir, Shahram	City of Oakland	250 FRANK H. OGAWA	Oakland	94612	510 238-3975	SAGHAMIR@OAKLANDNET.COM
Akers, Denise	The Forecast Group, L.P.	1796 Tribute Road #100	Sacramento	95815	916 920-0200	
Anderson, Ron	City of Vallejo	555 Santa Clara	Vallejo	94590	707 648-4387	jbetourne@ci.vallejo.ca.us
Bahr, Larry	Fairfield-Suisun Sewer District	1010 Chadbourne Road	Fairfield	94585	707 429-8930	lbahr@fssd.com
Ballman, Ed	Balance Hydrologics, Inc.	900 Modoc Street	Berkeley	94707	510 527-0727	office@balancehydro.com
Baxter, Tricia	Harris and Associates	220 Mason Circle	Concord	94520	925 827-4900	
Beck, Charles	City of Fairfield	1000 Webster St	Fairfield	94533	707 428-7784	
Bekiaris, Christopher	City of Pittsburg	65 Civic Ave.	Pittsburg	94565	925 439-4920	avan123@yahoo.com
Berges, Julia	City of Fairfield	1000 Webster St	Fairfield	94533	707 428-7461	
Betourne, Jack	Vallejo Sanitation & Flood Control	450 Ryder St.	Vallejo	94590		jbetourne@ci.vallejo.ca.us
Bond, Steven	Fall Creek Engineering	PO Box 7023	Santa Cruz	95061	831 426.9054	
Bunch, Don	Davidon Homes	1600 S. Main Street, suite	Walnut Creek	94596	925 945-8000	
Burgess, Dennis	Vallejo Sanitation & Flood Control	450 Ryder St.	Vallejo	94590	707 644-8949	
Bustamante, Abel	City of Vallejo	555 Santa Clara	Vallejo	94590	707 648-4387	jbetourne@ci.vallejo.ca.us
Celevante, Dario	City of Sausalito	420 Litho Street	Sausalito		415 289-4110	celevante@ci.sausalito.ca.us
Crawford, Gary	County of Solano, Transportation	333 Sunset Avenue, Ste 260	Suisun City	94585	707 421-6069	gcrawford@solanocounty.com
Dodini, Steve	Solano County Building Dept.	333 Sunset Avenue, Ste 260	Suisun City	94585	707 421-6073	
Donohue, Matt	RHL Design Group Inc.	1137 North McDowell Blvd	Petaluma	95954	707 765-1660	Mdonohue@RHLdesign.com
Feinstein, Dave	City of Fairfield	1000 Webster St	Fairfield	94533	707 428-7461	
Flores, Leo	County of Solano, Transportation	333 Sunset Avenue, Ste 260	Suisun City	94585	707 421-6073	jgomez@solanocounty.com
Ford, Bob	City of Modesto Community Serv.	P O Box 642	Modesto	95353	209 577-5353	bford@ci.modesto.ca.us
Francke, David L.	dk Associates, Inc.	1440 Maria Lane, Suite 200	Walnut Creek	94596	932-6868	dkassoc@jps.net
Fraser, Mary	Vallejo Planning Commission	450 Ryder St.	Vallejo	94590		
Gomez, James	County of Solano, Transportation	333 Sunset Avenue, Ste 260	Suisun City	94585	707 421-6069	jgomez@solanocounty.com
Goralka, Mark	ATI Engineering	3516 First Street	LIvermore	94550	925 648-8800	mgoralka@atiae.com
Gossett, Darin	dk Associates, Inc.	1440 Maria Lane, Suite 200	Walnut Creek	94596	925 932-6868	dkassoc@jps.net
Graves, Aaron	City of San Rafael	530 Seavey Lane	Petaluma		707 789-0910	agraves73@aol.com
Grubbs, Roger	Richmond American Homes	2280 Diamond Blvd. #500	Concord	94520	925 687.1812	
Guth, Robert	City of Pinole	2121 Pear St	Pinole	94564	510 724-9017	bob_guth_at_coppo@ci.pinole.ca.us

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Start at the Source

Workshop Attendance: 15 July 1999 Vallejo

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Haddox, Alan	Phillippi Engineering, Inc.	425 Merchant Street, Suite	Vacaville	95688	707 451-6556	pei-eng@pacbell.com
Haidari, Enayat	City of Vallejo	555 Santa Clara	Vallejo	94590		jbetourne@ci.vallejo.ca.us
Haugen, Roger	City of Vallejo	555 Santa Clara	Vallejo	94590	707 648-4387	jbetourne@ci.vallejo.ca.us
Hipkiss, Ron	Fairfield-Suisun Sewer District	1010 Chadbourne Road	Fairfield	94585	707 429-8930	rhipkiss@fssd.com
Hollenbeck, Mike	City of Vallejo	555 Santa Clara	Vallejo	94590	707 648-4387	jbetourne@ci.vallejo.ca.us
Holt, Lonnie	Vallejo Sanitation & Flood Control	450 Ryder St.	Vallejo	94590	707 644-8949	
Innes, Matt	Warmington Homes	3160 Crow Canyon Place,	San Ramon	94583	510 866-6700	
Jones, Sam	City of Napa	PO Box 660	Napa	94559	707 257-9520	sjones@cityofnapa.org
Krettecos, Chris	CSO Mare Island Naval Shipyard	PO Box 2193	Vallejo	94592	562.3094	
Kuemmerle, Vanessa	Vee Horticulture	1563 sOLANO aVENUE	Berkeley	94707	510 653.7667	
Lambert, Roland	City of Walnut Creek	PO Box 8039	Walnut Creek	94596	925 256.3598	
Marentette, Ray	MVP Architects				925 989.2482	
McCarthy, Catherine	Solano Co. Environmental Mgmt.	601 Texas Street	Fairfield	94533	707 421-6765	cmccarthy@solanocounty.com
McGee, Gary	Forecast Group	1796 Tribute Road #100	Sacramento	95815	916 920.0220	
McNeil, Leon	City of Vallejo	555 Santa Clara	Vallejo	94590	707 648-4387	jbetourne@ci.vallejo.ca.us
Monahan, Mike	Vallejo Sanitation & Flood Control	450 Ryder St.	Vallejo	94590	707 644-8949	
Mosley, Charles	Vallejo Sanitation & Flood Control	450 Ryder St.	Vallejo	94590	707 644-8949	
Mumley, Tom	Regional Water Quality Cntrl Brd	1515 Clay Street, 14th Floor	Oakland	94612	510 622.2396	
Nance, Kristine	CSW/Stuber-Stroeh	790 De Long Avenue	Novato	94945	415 892-4763	kristinen@cswst2.com
Nicolet, Brad	Solano Co. Environmental Mgmt.	601 Texas Street	Fairfield	94533	707 421-6765	bnicolet@solanocounty.com
Pavlinec, Joann	City of Berkeley Planning	2120 Milvia Street	Berkeley	94704-1	510 644-6137	
Payne, Peri	CCCSWA	1280 Civic Dr, #314	Walnut Creek	94596	925 299-1522	bart_carr@yahoo.com
Pedersen , John	City of Fairfield	1000 Webster St	Fairfield	94533	707 428-7784	
Ries, Melvin A.	CA Integrated Waste Mgmt. Brd.	8800 CA Center Dr MS 23	Sacramento	95826	916 255-2578	mries@ciwmb.ca.gov
Rinehart, Dennis	CSW/Stuber-Stroeh	790 De Long Avenue	Novato	94945	415 892-4763	dennisr@cswst2.com
Rokni, Shari	Rokni Development	PO Bos 358	Davis	95617	530 759.8929	
Ross, Harriet Lai	EIP Associates	1200 Second Street, Suite	Sacramento	95814	916 325.4800	
Ruff, Barbara	Fairfield-Suisun Sewer District	1010 Chadbourne Road	Fairfield	94585	707 429-8930	bruff@fssd.com
Sanders, Maria	City of Oakland	250 FRANK H. OGAWA	Oakland	94612	510 238-6766	

R0070634

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Workshop Attendance: 15 July 1999 Vallejo

Name	Affiliation	Address	City	Zip	Phone	Email
Schmidt, Steve	I.L. Schwartz Associates	79 Galli Drive	Novato	94949	415 883-9200	ilsassoc@slip.net
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Schrage, Hubi	Riechers, Spence & Associates	1541 Third Street	Napa	94559	707 252-3301	hschrage@rsacivil.com
Silva, Gillian	Vallejo Sanitation & Flood Control	450 Ryder Street	Vallejo	94590	707 644-8949	gsilva@ci.vallejo.ca.us
Silva, Gus	Vallejo Sanitation & Flood Control	450 Ryder St.	Vallejo	94590		
Silva, William	City of Concord	1950 Parkside Dr., MS 40	Concord	94519	925 671-3257	
Sneesby, Jared	Riechers, Spence & Associates	1541 Third Street	Napa	94559	707 252-3301	kdeibert@rsacivil.com
Sonjen, Eve	City of Fairfield	1000 Webster St	Fairfield	94533	707 428-7461	
Sortor, Talyon	Fairfield-Suisun Sewer District	1010 Chadbourne Road	Fairfield	94585	707 429-8930	tsortor@fssd.com
Spougue, Robert	Mandovich Development	6545 Sunrise Blvd, Suite 300	Citrus Heights			
Strelo, Kenneth	City of Pittsburg	65 Civic Ave.	Pittsburg	94565	925 439-4920	avan123@yahoo.com
Tackett, Alice	EIP Associates	1200 Second Street, Suite	Sacramento	95814	916 325.4800	
Tafolla, Dan	Vallejo Sanitation & Flood Control	450 Ryder Street	Vallejo	94590	707 644-8949	dtafolla@ci.vallejo.ca.us
Tambornini, Kraig	City of San Rafael	1400 5th Ave.	San Rafael	94901	415 485-3096	
Tannehill, Scott	RHL Design Group Inc.	1137 North McDowell Blvd	Petaluma	95954	707 765-1660	Stannehill@RHLdesign.com
Taul, Laurie	RWQCB-San Francisco Bay	1515 Clay Street, Ste. 1400	Oakland	94612	510 622-2508	LMT@rb2.swrcb.ca.gov
Teachout, Todd	City of Pleasant Hill	100 Gregory Lane	Pleasant Hill	94523	925 671-5261	
Thiem, Robb	Cunningham Engineering	2940 Spafford Street	Davis	95616	530 758-2026	
Tice, John	City of Woodland					
Uzegbu, Marcel	City of Oakland	250 Frank Ogawa Plaza	Oakland	94612		
Van Lorkhuysen, Mike	City of Fairfield	1000 Webster St	Fairfield	94533	707 428-7461	
Wanlass , Jeffrey	Phillippi Engineering, Inc.	425 Merchant Street, Suite	Vacaville	95688	707 451-6556	pei-eng@pacbell.com
Wehrle, Ben	Presley Homes	1350 Arnold Drive			925 229.8880	
Wright, Peter	City of Fairfield	1000 Webster St	Fairfield	94533	707 428-7784	
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R0070635

"START AT THE SOURCE"
INTERACTIVE WORKSHOP
JULY 22, 1999
HEATHER FARMS COMMUNITY CENTER
ATTENDANCE ROSTER

First Name	Last Name	Title	Agency	Street Address	City/zip
Victor	Carniglia	Deputy Director Community Development	City of Antioch	P.O. Box 5007	Antioch, CA 94509
John	Stevenson	City Engineer	City of Brentwood	708 Third Street	Brentwood, CA 94513
Bob	Drake	Principal Planner	County – Community Development Department	651 Pine Street	Martinez, CA 94553
Meera	Nagaraj	Planner	County – Community Development Department	651 Pine Street	Martinez, CA 94553
Jennifer	Peterson	Planner	County – Community Development Department	651 Pine Street	Martinez, CA 94553
Rose Marie	Pietras	Senior Planner	County – Community Development Department	651 Pine Street	Martinez, CA 94553
Beverly	Baclig		Central Contra Costa Sanitary District	5019 Imhoff Place	Martinez, CA 94553
David	Baldi		Central Contra Costa Sanitary District	5019 Imhoff Place	Martinez, CA 94553
Bart	Brandenburg		Central Contra Costa Sanitary District	5019 Imhoff Place	Martinez, CA 94553
Bob	Dragon		Central Contra Costa Sanitary District	5019 Imhoff Place	Martinez, CA 94553
Kiley	Kinnon	Source Control Inspector I	Central Contra Costa Sanitary District	5019 Imhoff Place	Martinez, CA 94553

R0070636

"START AT THE SOURCE"
INTERACTIVE WORKSHOP
JULY 22, 1999
HEATHER FARMS COMMUNITY CENTER
ATTENDANCE ROSTER

First Name	Last Name	Title	Agency	Street Address	City/zip
Jeremy	Graves	Community Director	City of Clayton	6000 Heritage Trail	Clayton, CA 94517
Laura	Hoffmeister	Asst to the City Manager	City of Clayton	6000 Heritage Trail	Clayton, Ca 94517
Melody	LaBella	Stormwater Program Manager	City of Concord	1957 Parkside Drive	Concord, CA 94519
Belinda	Uribe	Admin Clerk III	City of Concord	1957 Parkside Drive	Concord, CA 94519
Tom	Dalziel	Watershed Management Planning Specialist	Contra Costa Clean Water Program	255 Glacier Drive	Martinez, CA 94553
Sharon	Leavens	Administrative Aide	Contra Costa Clean Water Program	255 Glacier Drive	Martinez, CA 94553
Lisa	Pacheco	Program Staff	Contra Costa Clean Water Program	255 Glacier Drive	Martinez, CA 94553
Jim	Wilson	Engineer	Flood Control District	255 Glacier Drive	Martinez, CA 94553
Mario	Consolacion	Engineering Technician	Flood Control District	255 Glacier Drive	Martinez, Ca 94553
Leigh	Chavez	Planner	County	255 Glacier Drive	Martinez, CA 94553
Earl	Cosby	Planner	County	255 Glacier Drive	Martinez, CA 94553
Paul	Detjens	Engineer	County	255 Glacier Drive	Martinez, CA 94553
Kathleen	Fudge	Engineering Technician	County	255 Glacier Drive	Martinez, CA 94553
Jorge	Hernandez	Engineer	County	255 Glacier Drive	Martinez, Ca 94553
Dean	Inokuchi	Engineer	County	255 Glacier Drive	Martinez, CA 94553

R0070637

"START AT THE SOURCE"
INTERACTIVE WORKSHOP
JULY 22, 1999
HEATHER FARMS COMMUNITY CENTER
ATTENDANCE ROSTER

First Name	Last Name	Title	Agency	Street Address	City/zip
Neil	Leary	Associate Civil Engineer	County	255 Glacier Drive	Martinez, CA 94553
Frank	Navarro	Engineer	County	255 Glacier Drive	Martinez, CA 94553
Teri	Rie	Engineer	County	255 Glacier Drive	Martinez, CA 94553
Al	Schaal	Engineer	County	255 Glacier Drive	Martinez, Ca 94553
Steve	Wright	Senior Civil Engineer	County	255 Glacier Drive	Martinez, CA 94553
Joe	Yee	Senior Civil Engineer	County	255 Glacier Drive	Martinez, CA 94553
Nestor	Bulrgod	Grading Inspector II	County BI	651 Pine Street	Martinez, Ca 94553
Gary	Faria	Grading Inspector I	County BI	651 Pine Street	Martinez, Ca 94553
Ron	Hart	Grading Inspector I	County BI	651 Pine Street	Martinez, Ca 94553
Ron	Killough	Sr Grading Inspector	County BI	651 Pine Street	Martinez, Ca 94553
Greg	Staffelbach	Grading Inspector II	County BI	651 Pine Street	Martinez, Ca 94553
Jennie	Buckingham	Planner	County	651 Pine Street	Martinez, CA 94553
Kathleen	Chu	Associate Civil Engineer	Town of Danville	510 La Gonda Way,	Danville, CA 94526
Chris	McCann	Senior Planner	Town of Danville	510 La Gonda Way,	Danville, CA 94526
Leslie	Xavier	Summer Intern for Planning	Town of Danville	510 La Gonda Way,	Danville, CA 94526
Mark	Boucher	Senior Civil Engineer	Flood Control	255 Glacier Drive,	Martinez, CA 94553
Sam	Choi	Engineer	Flood Control	255 Glacier Drive	Martinez, CA 94553
Kathleen	Fudge	Engineering Technician	Flood Control	255 Glacier Drive	Martinez, CA 94553
Scott	Fukumoto		Flood Control	255 Glacier Drive,	Martinez, CA 94553
Slava	Gospodchikov	Engineer	Flood Control	255 Glacier Drive	Martinez, CA 94553
Tim	Jensen	Engineer	Flood Control	255 Glacier Drive	Martinez, CA 94553

R0070638

Baytech

San Jose, California



Grass swale with concrete edge

Stormwater Quality Controls

- Swale
- Catch Basin Inlet Filters
- Stormcepters (manufactured treatment system)

For more information please contact:

Mike Campbell
City of San Jose Planning 408.277.4576

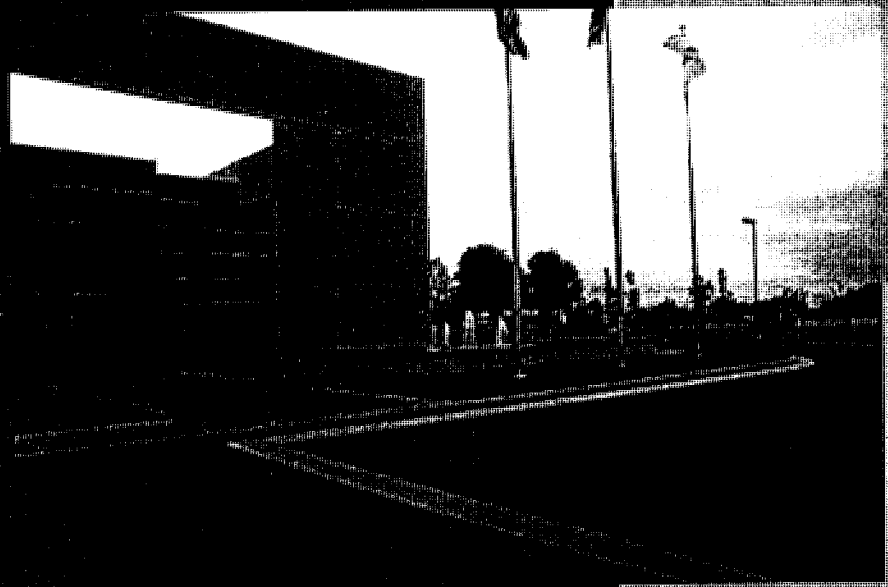
Start at the Source

Interactive Workshops 1999

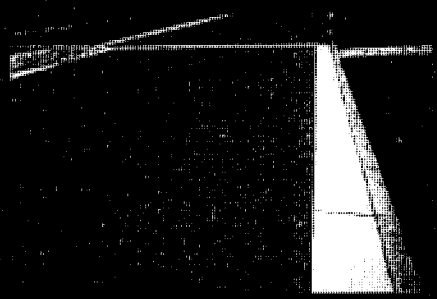
R0070639

Ionics

San Jose, California



Brick on sand paving at building entry



Brick on sand, detail

Stormwater Quality Controls

- Swale
- Permeable Pavement
- Catch Basin Inlet Filters

R0070640

Start at the Source

For more information please contact:

Mike Campbell
City of San Jose Planning 408.277.4576

Miller Creek

Housing Development
San Rafael, California



Drainage swale



100 foot setback from the creek

Stormwater Quality Controls

- Natural Drainage Swales
- 100' setbacks from Miller Creek
- Creek Revegetation

Setback has helped maintain creek integrity and bank stability

Start at the Source

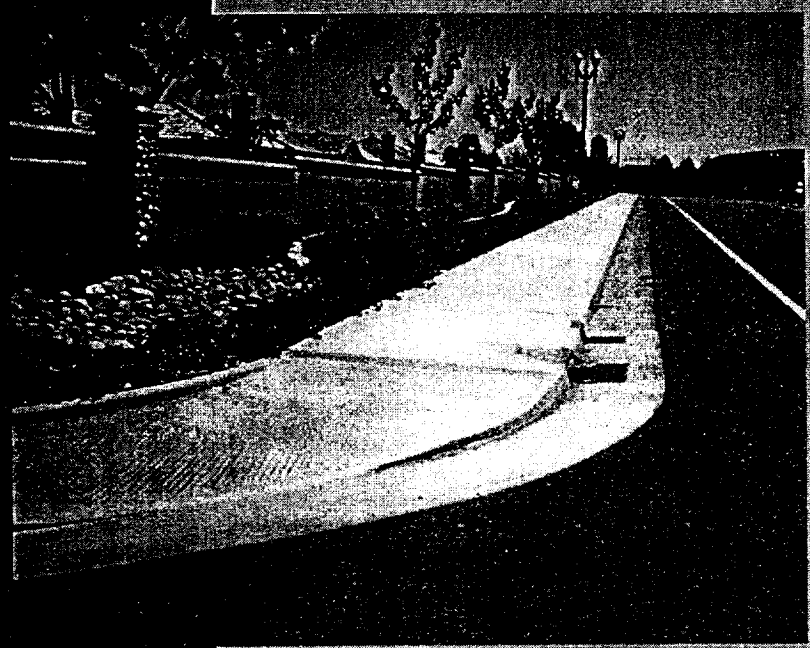
For more information please contact:

Jim Fox
Marin County Stormwater Program 415.499.6583

R0070641

Dual Drainage

Folsom, California



Two catch basins: first sized for small storms, second for large storms.



Grassy swale: note outlet of first catch basin.

Stormwater Quality Controls

- Treatment train system:
- Grass swale
- Regional detention basin

Upslope catch basin receives low flows (up to 2-year storm), directs into grass swale. Downslope catch basin receives higher flows, piped directly into storm drain. The storm drain empties into a large detention basin, where water filters through a wetland process and is finally emptied into the main waterway, the American River.

R0070642

For more information please contact:
Robert Blaser
City of Folsom Engineering 916 353 1705

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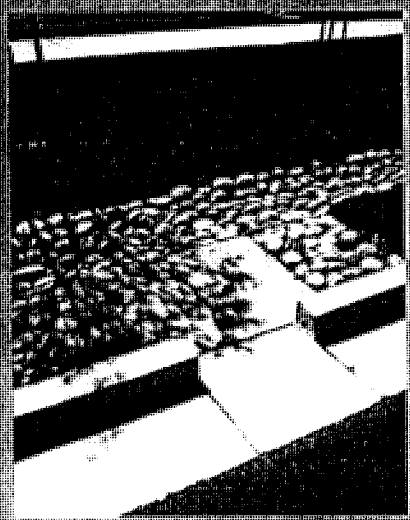
Interactive Workshops 1999

Pep Boys

Pittsburg, California



Cobble lined swale



Cobble detail



Cobble lined swale with drain

Stormwater Quality Controls

- Cobble Swale

Has been functioning for two years. Low maintenance technique to address parking lot runoff.

For more information please contact:

Carl Cahill 925.439.4961

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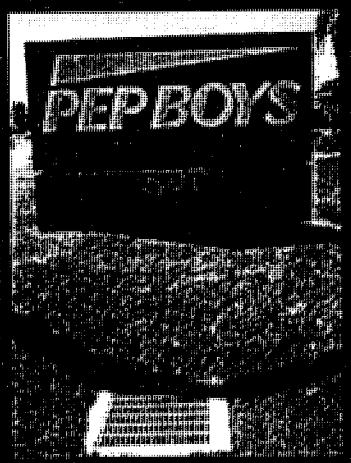
Pep Boys

Pleasant Hill, California



Drain inlet at end of swale



Grassy swale



Infiltration area with permeable path

Stormwater Quality Controls

- Grass Swale
- Fossil Filters
- Landscape sediment trap

Parking lot runoff filtered through swale and sediment trap then directed to outfall at Grayson Creek.

For more information please contact:

Todd Teachout
Senior Civil Engineer 925.671.5261

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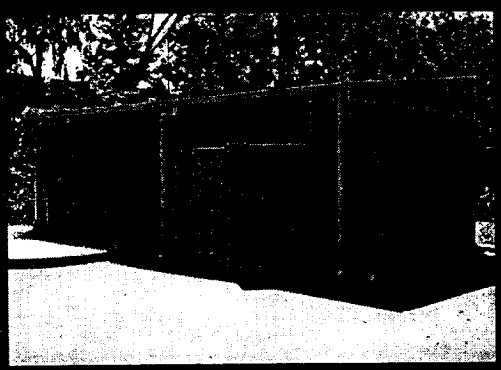
Office Building

Palo Alto, California



Covered and bermed trash enclosure



Parking strip as vegetated swale

Stormwater Quality Controls

- Vegetated Swale
- Bermed Dumpster Area
- Inlet Filters

R0070645

For more information please contact:

Joe Teresi
City of Palo Alto Engineering 650.329.2129

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Interactive Workshops 1999

SCVWD

Santa Clara Valley Water District Headquarters



Before

After, vegetated swale at parking lot



Detail showing swale with curbcut

Stormwater Quality Controls

- Vegetated Swales

R0070646

For more information please contact:

Start at the Source

"START AT THE SOURCE"
INTERACTIVE WORKSHOP
JULY 22, 1999
HEATHER FARMS COMMUNITY CENTER
ATTENDANCE ROSTER

First Name	Last Name	Title	Agency	Street Address	City/zip
Kevin	Shevlin		Flood Control	255 Glacier Drive,	Martinez, CA 94553
Eric	Whan	Engineer	Flood Control	255 Glacier Drive	Martinez, CA 94553
Erwin	Blancaflor		City of Hercules	111 Civic Drive	Hercules, CA 94547
Julia	DosSantos	Engrg. Analyst	City of Hercules	111 Civic Drive	Hercules, CA 94547
Mike	Henn		City of Lafayette	P.O. Box 1968	Lafayette, CA 94549
David	Knadle		Town of Moraga	KCA Engineers, Inc. 318 Brannan Street	San Francisco, CA 94107
Ken	Litle		Town of Moraga	KCA Engineers, Inc. 318 Brannan Street	San Francisco, CA 94107
Chip	Griffith		Town of Moraga	2222 Camino Ramon P.O. Box 5148	San Ramon, CA 94583
Lee	Evans		City of Orinda	P.O. Box 2000	Orinda, CA Orinda
Majeed	Bahri	Assistant Civil Engineer	City of Pittsburg	65 Civic Avenue P.O. Box 1518	Pittsburg, CA 94553
Ron	Nevels	Junior Civil Engineer	City of Pittsburg	65 Civic Avenue P.O. Box 1518	Pittsburg, CA 94553
Jaime	Rabara	Junior Civil Engineer	City of Pittsburg	65 Civic Avenue P.O. Box 1518	Pittsburg, CA 94553
Bill	Lightfoot		City of Pleasant Hill	100 Gregory Lane	Pleasant Hill, CA 94523
Henryk	Tay	Intern – Engineer	City of Pleasant Hill	100 Gregory Lane	Pleasant Hill, CA 94523

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"START AT THE SOURCE"
INTERACTIVE WORKSHOP
JULY 22, 1999
HEATHER FARMS COMMUNITY CENTER
ATTENDANCE ROSTER

First Name	Last Name	Title	Agency	Street Address	City/zip
Eva	Alexif	Associate Planner	City of Richmond		
Jay	Gandhi	Associate Civil Engineer	City of Richmond		
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Janice	Carey	Senior Civil Engineer	City of San Ramon	2222 Camino Ramon P.O. Box 5148	San Ramon, CA 94583
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Joan	Dolan		Tom Richman & Associates	654 Gilman Street	Palo Alto, CA 94301
Leah	Hickey		Tom Richman & Associates	654 Gilman Street	Palo Alto, CA 94301
Tara	Kelly		Tom Richman & Associates	654 Gilman Street	Palo Alto, CA 94301
David	Landry		Tom Richman & Associates	654 Gilman Street	Palo Alto, CA 94301
Tom	Richman		Tom Richman & Associates	654 Gilman Street	Palo Alto, CA 94301
Jake	Tobias		Tom Richman & Associates	654 Gilman Street	Palo Alto, CA 94301

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"START AT THE SOURCE"
INTERACTIVE WORKSHOP
JULY 22, 1999
HEATHER FARMS COMMUNITY CENTER
ATTENDANCE ROSTER

First Name	Last Name	Title	Agency	Street Address	City/zip
Jen	Worth		Tom Richman & Associates	654 Gilman Street	Palo Alto, CA 94301
David	Wallace	Assistant Planning Manager	City of Walnut Creek	P.O. Box 8039	Walnut Creek, CA 94596
Christine	Gregory		Consultant	2134 Red Rock	Martinez, CA 94553

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R0070649

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Workshop Attendance: 4 August 1999 Campbell

Name	Affiliation	Address	City	Zip	Phone	Email
Alicea, Louie	City of Sunnyvale	221 Commercial	Sunnyvale	94088	408 730.7565	
Alkire, Martin	City of Mountain View	500 Castro St.	Mountain View		650 903-6306	
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Armstrong, Daniel W.	Sandis Humber Jones	605 Castro St.	Mountain View	94041	650 969-6900	darmstro@shj-ca.com
Arroyo, Yvonne	Santa Clara Valley Water District	5750 Almaden Expwy	San Jose	95118	408 265-2600	
Beard, Barbara	Thomas Reid Associates	Box 880	Palo Alto	94301	650 327.9429	
Bicknell, Jill	EOA Inc.	699 Town & Country	Sunnyvale	94086	408 720-8811	jcbicknell@eoainc.com
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Brennan, Cathleen	City of Sunnyvale	1444 Borregas Ave.	Sunnyvale	94088	408 730-7267	
Buckhart, Bill	City of Campbell	70 North First Street	Campbell	95008	408 866-2153	
Campbell, Mike	City of San Jose Planning	801 North First Street,	San Jose	95120	408 277-8552	mike.campbell@ci.sj.ca.us
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Catunao, Val	City of Milpitas Fire Department	455 E. Calaveras Blvd.	Milpitas		408 586-3372	vcatunao@ci.milpitas.ca.gov
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Dayley, Cheryl	SJ Environmental Services Dept.	4245 Zanker Road	San Jose	95134	408 945 3030	cheryl.dayley@ci.sj.ca.us
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Doyle, Ross	Ruggeri Jensen Associates	100 N. Milpitas Blvd., Suite	Milpitas	95035	408 934-1388	
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R0070650

Workshop Attendance: 4 August 1999 Campbell

Name	Affiliation	Address	City	Zip	Phone	Email
Fostersmith, Ellen	Santa Clara Valley Water District	5750 Almaden Expwy	San Jose	95118	408 265-2600	
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Gomez, Chuck	City of Campbell	70 North First Street	Campbell	95008	408 866-2153	
Haase, Peter	Fall Creek Engineering	PO Box 7023	Santa Cruz	95061	831 426.9054	
Haggerty, Colleen	Santa Clara Valley Water District	5750 Almaden Expwy	San Jose	95118	408 265-2600	
Harvancik, Iveta	Saratoga Public Works Department	13777 Fruitvale Ave.	Saratoga		408 868-1274	
Helms, Bill	City of Campbell	70 North First Street	Campbell	95008	408 866-2153	
Hipol, Theodore	Santa Clara Valley Water District	5750 Almaden Expwy	San Jose	95118	408 265-2600	
Hirotsuka, Yosh	City of Los Altos	1 N. San Antonio Rd.	Los Altos	94022	650 948-1491	
Homan, Steve	County of Santa Clara	70 West Hedding, 7th	San Jose		408 299-2871	steve_homan@qmgate.pln.co.santa-clara.ca.us
Housley, Harold	City of Campbell	70 North First Street	Campbell	95008	408 866-2153	
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Jansen, Gary	City of San Jose	801 N. 1st Street, Room 308	San Jose	95110	408 277-5161	maria.balderama@ci.sj.ca.us
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R00070651

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Workshop Attendance: 4 August 1999 Campbell

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Miller, Bill	City of Fremont - D.E.S Dept/	PO Box 5006	Fremont	94537	510 494-4700	bmiller@ci.fremont.ca.us
Moeller, Randy	Sunnyvale Water Pollution Control	1444 Borregas Ave.	Sunnyvale	94088	408 730-7271	rmoeller@ci.sunnyvale.ca.us
Moore, Janis	City of San Jose Planning	801 North First Street	San Jose	95110	408 277-4576	janis.moore@ci.sj.ca.us
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Ng, Barry	City of San Jose	801 N. 1st Street, Room 308	San Jose	95110	408 277-5161	barry.ng@ci.sj.ca.us
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Noel, Dunia	County of Santa Clara	70 West Hedding, 7th	San Jose		408 299-2454	dunia_noel@qmgate.pln.co.santa-clara.ca.usa.us
O'Brien, James	Santa Clara Valley Water District	5750 Almaden Expwy	San Jose	95118	408 265-2600	
Pamintuan, Cora	City of San Jose	801 N. 1st Street, Room 308	San Jose	95110	408 277-5161	corazon.pamintuan@ci.sj.ca.us
Patterson, Bob	Naval Support Activity Monterey B	1 University Circle Code	Monterey	93943	831 656-2531	
Pearson, Erik	City of Saratoga	13772 Fruitvale Avenue	Saratoga	95070	408 868.1231	
Perry, Monty	M.B.A.R.I.	P.O.Box 628	Moss Landing	95039	831 775-1749	monty@mbari.org
Plymale, Phillip	City of Palo Alto	PO Box 10250, 250	Palo Alto	94303	650 329-2456	phil_plymale@city.palo-alto.ca.us
Price, David	San Mateo County Planner	455 County Center	Redwood City	94063	650 363-1850	dtprice@yahoo.com
Price, Gail	City of Sunnyvale	456 West Olive	Sunnyvale	94088	408 730-7257	
Ratcliffe, Christine	City of Saratoga	13772 Fruitvale Avenue	Saratoga	95070	408 868.1231	
Roberson, Charlie	SJ Environmental Services Dept.	4245 Zanker Road	San Jose	95134	408 945 3044	charlie.roberson@ci.sj.ca.us
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Rush, Marina	City of Milpitas Planning Dept.	455 E. Calaveras Blvd	Milpitas	95050	586-3272	
Sanchez, Michael	San Mateo Co. Public Works Dept.	10 Twin Dolphin Drive,	Redwood City	94065	650 599.1456	
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Schaller, Mike	San Mateo County Planning	455 County Center, 2nd	Redwood City	94063	650 363-1849	
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Workshop Attendance: 4 August 1999 Campbell

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Sipes, Kristen	SJ Environmental Services Dept.	4245 Zanker Road	San Jose	95134	408 945 3060	kristen.sipes@ci.sj.ca.us
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Sohrabi, Ebrahim	City of San Jose	801 N. 1st Street, #308	San Jose	95110	408 277-5161	
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Tam, Tina	City of San Jose Planning	801 N. First Street, #400	San Jose	95110	408 277-4576	
Thomas, Paul	Santa Clara Valley Water District	5750 Almaden Expwy	San Jose	95118	408 265-2600	
Toy, Lily	San Mateo County	455 County Center	Redwood City	94063	650 363-1841	ltoy@co.sanmateo.ca.us
Turner, Kathrin	Santa Clara Valley Water District	5750 Almaden Expwy	San Jose	95118	408 265-2600	
Walgren, James	City of Saratoga	13772 Fruitvale Avenue	Saratoga	95070	408 868.1231	
Walsh, Susan	City of San Jose Planning Dept.	801 N. 1st Street	San Jose	95110	408 277-4576	
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Weinrich, Gary	City of Palo Alto	PO Box 10250, 250	Palo Alto	94303	650 329-2456	weinreich@city.palo-alto.ca.us
Wilder, Gabrielle	City of San Jose PWD	675 North First Street	San Jose	95112	408 277-4777	gabrielle.wilder@ci.sj.ca.us
Wilson, Everett L.	SJ Environmental Services Dept.	4245 Zanker Road	San Jose	95134	408 945 3040	everett.wilson@ci.sj.ca.us
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R0070653

Appendix 2 - Evaluation Summary

BASMAA
Start at the Source Workshops

EVALUATION SUMMARY

494 Participants
427 Evaluation Responses

A Workshop Content & Format

1 Please rate the workshop overall:

(Worst = 1, Best = 5)

Content	4.3
Process	4.2

2 How could the workshop be improved?

#of similar comments	comment
Format	
74	Workshop could be longer
22	More discussion; question & answer period
4	More anecdotes, testimonials from participants
Content	
33	More detailed information on technical details, cost, practical application
24	More case studies/examples
8	More regulatory/enforcement information
Staff	
8	Regional Board speaker could be improved
3	Facilitators could be better
2	Speakers could be better
Hands-on Exercise	
39	More time for hands-on exercise
Slides/Visuals	
14	More slides
5	Slides too long, suggestions for improvement (quality, etc.)
4	More visual aids
Physical/Logistical Aspects	
25	Mix of participants at workshop/at tables (a better mix of disciplines)
24	Physical environment (location, room, lighting, food, parking, etc.)
11	Coordination/logistics (directions, registration, timing, etc.)
10	Number of participants (too many participants at table; wanted more people attending)

3 What did you particularly like about the workshop?

Content

262 Hands-on activity/group site planning exercise (fun, gets people involved, great chance to cooperate with others who have different view, opportunity to test concepts/cost trade-offs)

110 Slides (in general)

55 General content was informative, good introduction, learned alternative approaches/solutions

34 Book (*Start at the Source*)

20 Slides (San Milpaloandro failure case studies)

19 Case studies

14 Visuals - materials, posters

Format

55 Good Presentation (well-organized, dynamic, good pace, good time-management, varied activity)

35 Interactive/hands-on approach

29 Working with people from other fields/getting new perspectives (chance to discuss ideas in group setting with wide range of professionals)

Staff

20 Speaker (motivated, intelligent, good jokes)

3 Facilitators/staff

Physical/Logistical Aspect

2 Location

2 Food

4 What other workshops or training would you like to see BASMAA or your local stormwater program provide?

Field workshops

27 Field trip/site visit to see case studies, stormwater controls (BMPs) in place, learn what works and what doesn't

4 In-house training (bring workshop into office or department, have all involved present)

Administrative

16 General regulatory information (ordinances, zoning codes, enforcement issues, etc.)

4 Leadership and communication (how to educate others)

4 Regional Board updates on Phase I/Phase II transition

3 Help on how to get this information into guidelines, ordinances, zoning regulations

Technical workshops

20 Design/details/data

13 Construction/erosion control

10 Creeks/restoration/wetlands/waterbodies

9 Installation and Maintenance

9 Infill/built-out/urban areas

3 Landscape

4 Pollution prevention

15 More of this same workshop

Workshops targeted at:

- 20 Developers
- 7 Inspectors
- 5 Planners
- 5 Public/homeowners
- 6 Policymakers (city council, planning commissioners)
- 4 Private sector
- 5 Contractors
- 7 Designers
- 2 Engineers

B Applying "Start at the Source"

1 How will you apply these concepts in your work?

Knowledge

- 68 Have better understanding of subject, installation, options and alternative solutions
- 28 Will advocate these concepts (offer alternative solutions, speak up at meetings)
- 16 Will use *Start at the Source* as a reference
- 3 Will give the issue more attention

Education

- 18 Will discuss with co-workers
- 9 Will talk with other departments
- 10 Will educate developer
- 7 Will educate planners
- 5 Will develop design guidelines/materials/training
- 11 Will educate public/homeowners
- 4 Will educate policymakers

Design/Development process

- 82 Will apply in design projects
- 1 Will improve coordination
- 1 Will apply to redevelopment projects
- 1 Will apply to commercial/industrial projects

Review Process

- 114 In the design review/plan check/permitting process
- 16 Will address early in the planning stage process/hold pre-approval meetings
- 19 Zoning/design regulations/documents/mitigation measures
- 12 Will make techniques conditions of approval

Construction process

- 6 Inspection

2 What obstacles do you perceive to applying these concepts?

Implementation

- 91 Cost
- 16 Maintenance
- 10 Construction
- 7 Inspection

Mentality/mindset

102 Breaking away from traditional approaches/practices, unfamiliarity of new concepts
53 Developer resistance
9 Public preference

Communication

14 Lack of support (from superiors, policymakers)
10 Lack of communication
12 Lack of coordination (between departments, disciplines)
5 Lack of consensus (between agencies, departments)

Administration, departments, people

53 Existing regulations/zoning ordinances/codes/city standards
24 Political obstacles
7 Public Works
4 Liability
2 Planners
5 Engineers
1 Policymakers (city council, planning commission)

Education

19 Education for all involved
13 Lack of education
7 Education for designers
10 Education for clients/public
3 Education for policymakers
3 Education for developers
7 Education for contractors
2 Education for planners
2 Education for engineers

Lack of proof

10 Lack of history/proven effectiveness
6 Lack of quantifiable standards
4 Lack of technical knowledge among designers
1 Lack of pollutant removal data

Constraints

12 Geology/hydrology/soils
10 Infill/urban sites
2 Parking–loss of
3 Technical

3 What would help you to overcome those obstacles?

8 Incentives
10 Time
5 Fresh employees/new generation
4 Persistence
3 Increased awareness

R0070658

Education/training

- 43 Of all involved
- 26 BASMAA workshops
- 20 Developers
- 18 Policymakers/decisionmakers
- 11 Clients/public
- 5 Contractors
- 5 Designers
- 6 Engineers
- 4 Planners
- 6 Inspectors
- 4 Read the Start at the Source Manual

Regulatory

- 45 Requirements/zoning/ordinances
- 13 Assistance from Regional Board
- 4 Enforcement mechanism
- 2 Support from local policymakers

More Proof

- 18 Pilot projects/demonstration projects/examples
- 27 Case studies of built projects
- 12 Statistics/cost information
- 6 Research
- 7 Technical information/details
- 4 Experienced suggestions

Communication

- 9 Better communication
- 6 Interdepartmental coordination
- 4 Communication earlier–in the planning stages

Design process

- 2 Design properly
- 2 Work with contractor during design phase
- 1 Start in planning phase

Appendix 3 - Posters

ADVO

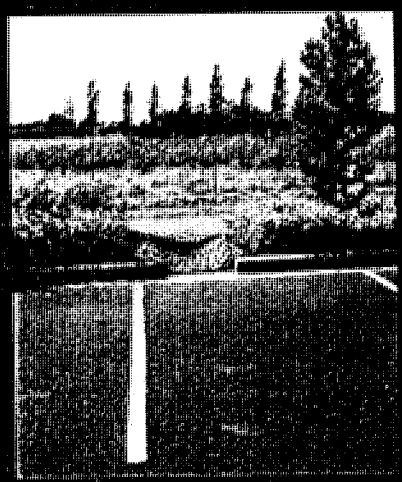
Newark, California



Cobble lined v-notches, detail



Cobbled swale



Cobble lined v-notches,

Stormwater Quality Controls

- Grassy Swale
- Inlet Filters

No direct inlet connection. 60% of site (asphalt parking lot) drains into grassy swale. Roof downspouts discharge onto parking lot sloped to drain through v-notches in curb, across cobbles, through a grassy swale into storm drain inlets.

R0070661

For more information please contact:

Will Wolbertus
Associate Civil Engineer 510.790.7265

Start at the Source

Design Workshops 1999

BT Office Supply

Newark, California



Grassy swale



Cobble lined v-notches

Stormwater Quality Controls

- Grassy Swale
- Inlet Filters

Half of roof runoff and half of the asphalt parking lot drain into swale. The other half of the site and roof discharges to drain inlets that have been fitted with filter inserts. Maintenance contract submittal required for inlet filters.

R0070662

For more information please contact:

Will Wolbertus
Associate Civil Engineer 510.790.7265

Start at the Source

Innovative Workshops 1999

D.U.S.T. Marsh

Demonstration Urban Stormwater Treatment System Newark, California



Marsh with log baffle



Log baffle, detail

Stormwater Quality Controls

- Constructed Marsh

Flood control drainage channel collects runoff from storm drains and conveys it to D.U.S.T. Marsh. Log baffle interrupts surface flow and mixes fresh stormwater with saline resident water. Pollutants are detained in marsh, diluted by mixing with resident water, and treated.

R0070663

For more information please contact:

Richard Wetzig, Alameda County
Urban Runoff Clean Water Program 510.670.6478

Start at the Source

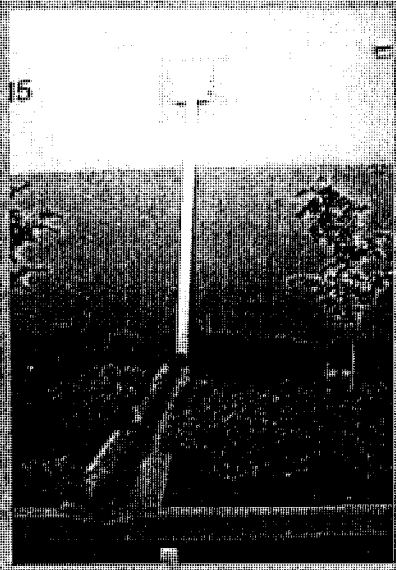
Design Guidance Manual for Stormwater Quality Protection

Gateway

Newark, California



Grassy swale



Roof runoff directed to drain inlets

Stormwater Quality Controls

- Grassy Swale
- Inlet Filters

A portion of the asphalt parking lot and half of the roof drain into swale. The balance of the site and roof discharges to drain inlets that have been fitted with filter inserts. Maintenance contract submittal required for inlet filters.

R0070664

For more information please contact:

Will Wolbertus
Associate Civil Engineer 510.790.7265

Sun Microsystems

Coyote Tract - Newark, California



Open drainage channel (planting to be completed Fall 1999)



Landscape infiltration area

Stormwater Quality Controls

- Inlet Filters
- Vegetated open drainage channels
- All parking lot inlets fitted with filter inserts.

Storm drain system discharges into vegetated open drainage channels, 6 feet wide with 2:1 side slopes for pre-treatment before flowing into a retention basin prior to discharging into the Bay. Design depth of flow in channels varies from approx. 1 to 2 feet. Maintenance contract submittal required for inlet filters.

R0070665

For more information please contact:

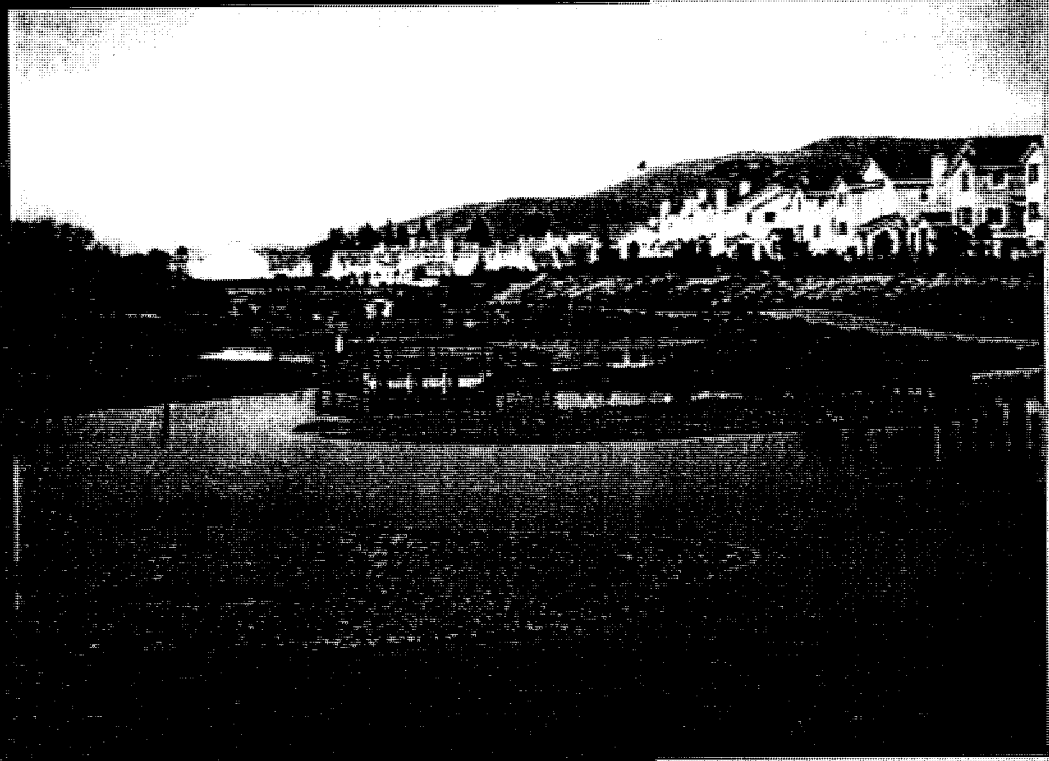
Wil Wolberus
Associate Civil Engineer 510.790.7265

Start at the Source

Bay Area Stormwater Management Agencies Association 1999

Tule Pond

Fremont, California



Constructed islands in pond

Stormwater Quality Controls

- Constructed Wetland

Runoff proceeds through three ponds before entering adjacent existing permanent pond. Heavy metals bind to clay particles, which settle out of water column. Log baffle, constructed islands, and prevailing winds across water surface force stormwater to mix with resident water.

R0070666

For more information please contact:
Richard Wetzig, Alameda County
Urban Runoff Clean Water Program 510.670.6478

Start at the Source
Interactive Workshops 1999

Residential

Livermore, California



Grassy swale



Detail of piping under sidewalk

Stormwater Quality Controls

- Grassy Swales in parkway strip

After installation, swales were modified to include continuous subdrain under swale, reduced depth of swale, and trees were relocated from bottom to side slopes of channel.

City has changed design guidance for future swales (in residential areas) to include minimum 15 foot wide parkway, underdrain for swales having less than 1% slope, minimum 2 foot wide bottom of swale for ease of mowing.

R0070667

For more information please contact:

Darren Greenwood
City of Livermore Water Resources Division 925.373.5295

Incyte

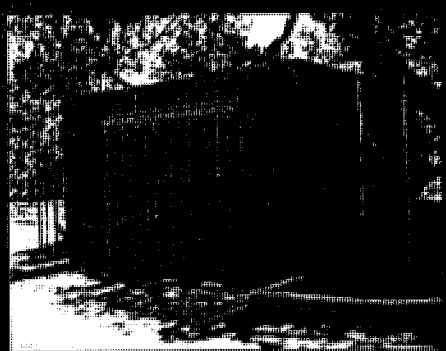
Palo Alto, California



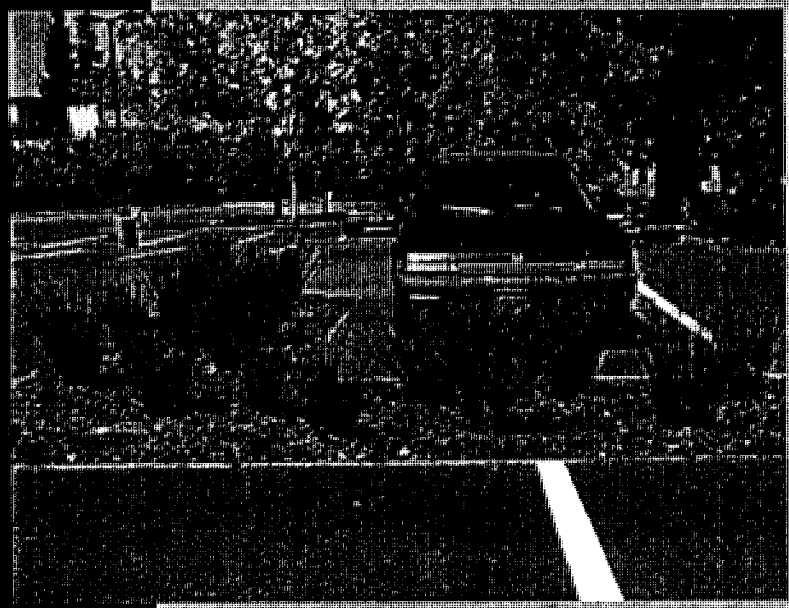
Covered and bermed trash enclosure



Unit pavers on sand



Covered loading dock



No curbs allows parking to drain to planted areas

Stormwater Quality Controls

- Vegetated Swales
- Catch Basin Inlet Filters
- Bermed Trash Enclosure
- Permeable Pavement
- Covered Loading Dock

Parking lot drains to vegetated swales. Permeable pavers on sand were used to protect heritage oak trees.

R0070668

For more information please contact:

Joe Teresi
City of Palo Alto Engineering 650.329.2129

Start at the Source

Interactive Workshop 1999

McCutcheon Doyle

Palo Alto, California



Vegetated swale with checkdam

Stormwater Quality Controls

- Vegetated Swale
- Detention Basin
- Covered Parking with Interceptor

Vegetated swale collects parking lot and roof runoff. Check dams slow run-off. Lack of coordination between disciplines resulted in detention basin receiving too much water and it had to be filled with soil.

R0070669

For more information please contact:

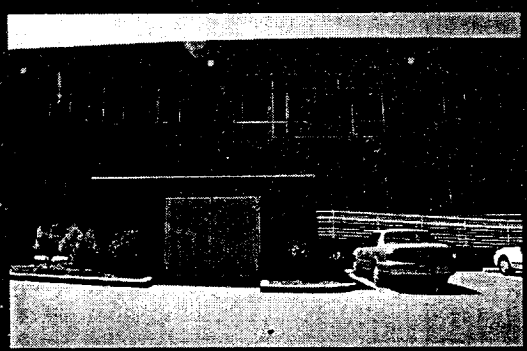
Joe Teresi
City of Palo Alto Engineering 650.329.2129

TIBCO

Palo Alto, California



Vegetated swale with notched curb



Covered and bermed trash enclosure



Notched curb at swale

Stormwater Quality Controls

- Grassy Swales
- Covered Loading Dock
- Covered Trash Enclosure

R0070670

For more information please contact:

Joe Teresi
City of Palo Alto Engineering 650.329.2129

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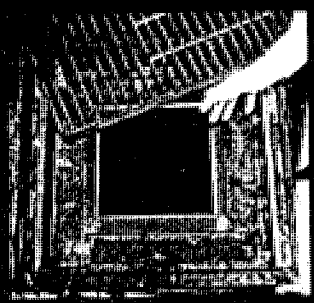
Interactive Workshops 1999

Office Building

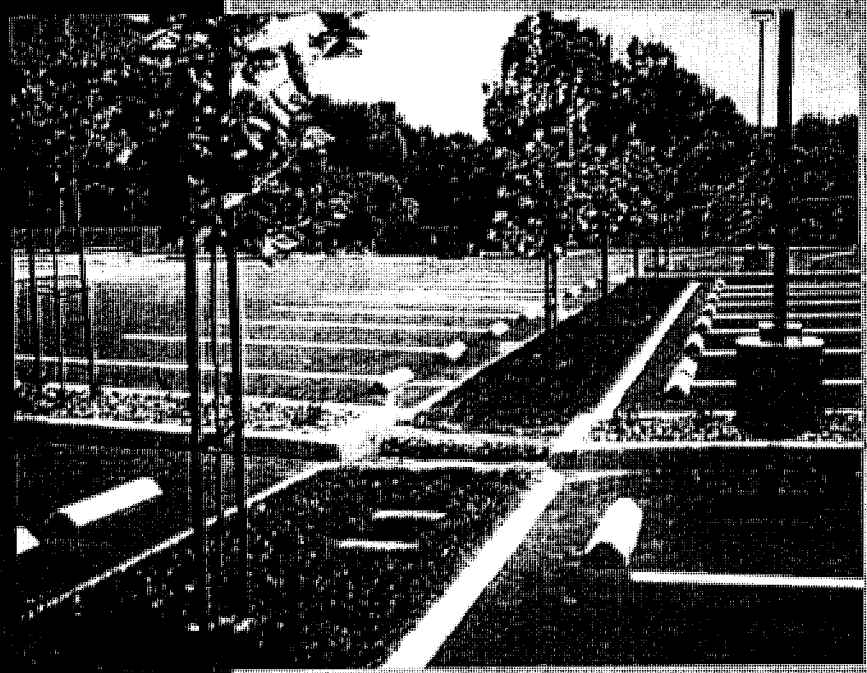
Palo Alto, California



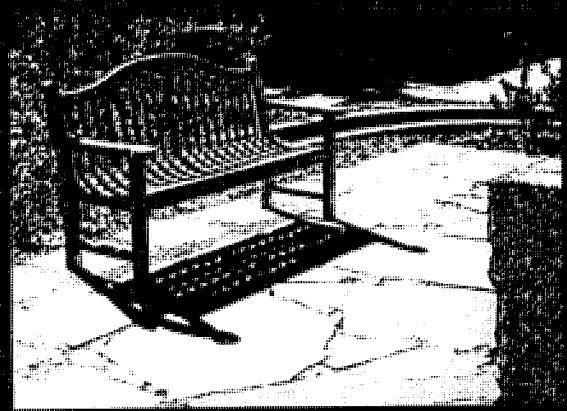
Catch basin inlet filter



Swale with drain, detail



Grass swale in parking lot



Patio with permeable pavement

Stormwater Quality Controls

- Grassy Swales
- Catch Basin Inlet Filters
- Bermed dumpster area
- Permeable Pavement

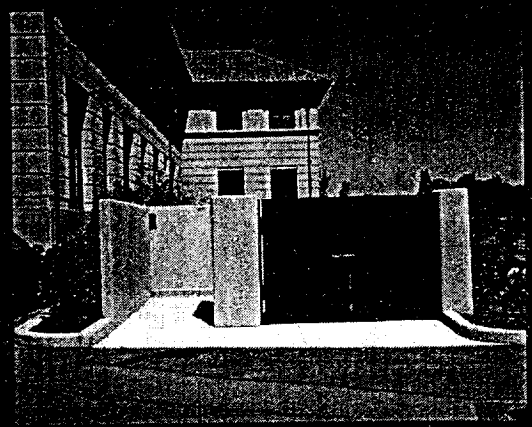
R0070671

For more information please contact:

Joe Teresi
City of Palo Alto Engineering, 650.329.2129

Office Building

Palo Alto, California



Bermed trash enclosure



Pathway with permeable pavement

Stormwater Quality Controls

- Permeable Pavement
- Grassy Swale
- Bermed Dumpster Area
- Catch Basin Inlet Filters

Loading dock drains to sanitary sewer with valve

R0070672

For more information please contact:

Joe Teresi
City of Palo Alto Engineering 650.329.2129

DRAFT: Alternative Policy Approach for Urban Stormwater Runoff

The following policy concept is offered to the Regional Board as an alternative approach for counteracting the growing problem of water pollution caused by unmanaged urban stormwater runoff. This approach recognizes a history of deferrals associated with efforts to implement non-point source water programs that endeavor to improve this water quality in the Los Angeles Basin.

This approach reflects the belief of those who have participated in its formulation that the positive participation of local government in the Basin is essential to any successful effort to improve water quality in this "new" area of great concern. Without the positive participation of local governments in this solution, the prospects for achieving the earliest possible program implementation and for getting the needed water quality benefits will be needlessly delayed.

This approach has the unique advantage of bringing to the Regional Board an additional dimension of commitment and effort to get control of the urban stormwater runoff problem. Instead of the pending efforts that pit the Regional Board directly against local governments whose elected leaders are largely unprepared for this kind of problem-solving, this alternative approach considers a constructive role for the leading regional governmental entity, the Southern California Association of Governments (SCAG). SCAG is uniquely positioned to contribute organizational resources that will bring success to this complex process. These resources would include bringing elected leaders together to participate in policy development and implementation, organizing educational outreach among the leaders of its sub-regional councils of governments, advocating for large-scale program and legislative funding in both Sacramento and Washington, D.C.

This new approach includes the advantages of parallel efforts in the first stage of the new program. During the first stage, along with developing the needed awareness and commitments of local government leaders to their essential part in managing stormwater runoff pollution, the program needs time to perfect its regulatory rules. These rules, as applied to different watersheds in the Basin, need to be ultimately written so that they do produce improved water quality results in a Region with substantial variances in hydrology, rainfall, land uses and infrastructure.

Accordingly, the following action is suggested:

1. *The Regional Board/Executive Officer enacts a numeric standard for mitigating urban stormwater runoff from the identified new construction sites in the Los Angeles Basin. This standard would be a voluntary standard for the first (24) months of the program. The standard would be defined as follows:.... Other definitions associated with the policy would be described as follows....*

Associated with this action are the following other actions/activities:

2. *During the first (24) months the Regional Board, working with city governments and Los Angeles County, will encourage a variety of pilot projects in which the voluntary standard is implemented and evaluated. These initial implementations will be used to learn what methods and designs produce the most effective overall results. Included in these evaluations would be assessments of possible design criteria for mitigation projects, of feasibility, of cost effectiveness and of possible unintended environmental consequences of the initial voluntary standard.*

3. *The following types and locations of pilot projects would be encouraged:.....*

4. *These pilots would be used to get answers to the following important questions/issues:....*

5. *During the first (24) months, along with its commitment to facilitate city government participation in the implementation and refinement of the Regional Board's policy, SCAG will facilitate a fundraising effort to obtain resources for planning and developing watershed-scale mitigation programs in the Basin. These programs would significantly broaden the currently proposed effort from new construction sites only to all properties in a watershed.*

6. *In order to develop a successful watershed-scale planning effort to manage stormwater runoff, SCAG would assist in bringing together key organizations and stakeholders. These participants would contribute to an integrated approach to program design and assure the effort of maximum support from various governmental agencies and business interests. Examples of these organizations and stakeholders would include: environmental organizations, federal agencies like the Army Corps of Engineers, state agencies like Cal Trans, area watershed councils, councils of governments, ...*

7. *Fundraising efforts for this program would draw on SCAG's existing Section 208 authorities, as well as on the resources associated with other collaborators in the watershed planning effort. These efforts would be directed towards any future potential funding sources such as a new state water bond or new governmental clean water appropriations targeting watershed management plans.*

NEXT PAGE >

What is Caltrans' Storm Water Management Program?

and improve the quality of water in California by preventing adverse effects of storm water runoff from Caltrans' roadways and facilities.

statewide effort to preserve



Testing erosion control methods

Where?

Rain water washes materials from highways, streets, and gutters into the storm drain system. This water flows into our rivers, lakes, and the ocean. Preventing harmful effects from storm water runoff is a growing concern for many communities across the nation.

How?

Highways typically contain vehicle exhaust products, brake and tire materials, oil and grease, litter, and other materials that get flushed through the storm drain system to our waterways.

Why?

Caltrans is the agency responsible for managing California's state highway system. Its Storm Water Program has two primary goals. First, to comply with the requirements of the federal Clean Water Act and resulting National Pollutant Discharge Elimination System (NPDES) permit and other state requirements. Second, to provide the most cost-effective solutions for mitigating the harmful effects of storm water runoff.

NEXT PAGE >

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R0070675

Highway Design Manual

CHAPTER 890
STORM WATER MANAGEMENT

Topic 893 -Maintenance Requirements for Storm Water Management Features

Index 893.1 - General

As mentioned previously, the ability and the commitment to maintain storm water management facilities is necessary for their proper operation. The designer must consider the maintenance needs, and the type of maintenance that will take place, in order to provide for adequate access to and within the facility site.

Additionally, the designer should initiate both verbal and written contact with District maintenance to verify the availability of resources to provide proper maintenance and to keep them aware of potential high maintenance items that will be constructed. Initial estimates of how often sediment removal should be performed should be provided by the designer based upon estimated design loadings. Other types of maintenance, such as periodic inspections of embankments, inlet/outlet structures, debris removal, etc. should also be discussed. Due to the large capital investment required for constructing storm water management facilities, proper maintenance cannot be overlooked.

By definition, detained water contributes to runoff and therefore detention ponds or basins must have an outlet and outfall system (see Index 816.4). A gravity outfall should be used whenever feasible. Pumping should only be used where there is no other practical way of handling the excess runoff. See Topic 839 for further discussion on pumping stations.

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Highway Design Manual



CHAPTER 890
STORM WATER MANAGEMENT

Topic 892 - Storm Water Management Strategies

Index 892.1 - General

(1) Expected Water Quality Benefits. Strategies aimed at managing storm water quality are a relatively recent development. Performance data from full-scale, field applications are few and site climatology and pollutant loadings can have considerable variation and a wide range of impacts on a given strategy. As a result, any discussion of the various storm water management strategies can only give approximate ranges of pollutant removal capabilities.

New technologies or strategies for water quality control are likely to develop which will require the modification of, or make obsolete, strategies that are currently being utilized. On-going monitoring, not only of the direct storm water runoff, but also the effects on receiving waters, humans, vegetation and aquatic life is being conducted to determine the long term cost effectiveness of the structural control measures selected, and any future revisions that might be necessary.

(2) Water Quality Strategy Implementation. Storm water treatment controls, unlike source controls, are often high cost items that will require extensive long term maintenance. Any decision to implement one, or more, strategies must consider site constraints, demonstrated need based upon the beneficial uses of the receiving waters, effectiveness of alternative source and treatment control measures, potential for system failure based upon site conditions and pollutant loadings, public/worker safety and availability of maintenance staff to keep the facility in proper working condition.

Implementation of storm water management concepts must also conform to the policies set forth in the Caltrans Storm Water Management Plan. This state-wide plan is being developed in concert with a proposed state-wide NPDES storm water permit and provides a framework within which the Department will address storm water quality issues.

(3) Quantity / Quality Relationship. Manage-ment of storm water quality often requires the assessment of relatively small runoff producing events. As much as 80 percent of average annual rainfall is produced by storms with return periods of two to six months. As a result, water quality facilities are typically sized to address relatively small runoff volumes. Conversely, storm water quantity management is typically directed at reducing the peak flow rate on storms with a 10-year or greater return period, and water quantity control facilities must be sized accordingly.

In order to achieve both water quantity and quality benefits, it may be necessary to use a combination of strategies or control measures. For example, placement of a relatively small detention basin or filtration immediately upstream of a quantity attenuating detention basin can provide sediment capture, while allowing larger flows to be mitigated by the major basin. Some types of water quality control measures will need to incorporate bypass features so that the smaller, more frequent, runoff events can be treated while still allowing larger flows to be routed away from the traveled way.

892.2 Types of Strategies

There are various storm water management strategies which may be used to mitigate the effects of storm water runoff problems. They vary from very simple to very complex techniques depending upon specific

site conditions and regulatory requirements which must be satisfied.

The Caltrans Storm Water Quality Handbook, "Planning and Design Staff Guide" provides both design guidance on specific water quality control measures as well as a more general discussion of how and when to incorporate water quality control measures into projects.

In addition to the measures described in the Storm Water Quality Handbooks, the following measures may provide relief in dealing with the water quantity side of storm water management.

(1) Detention & Retention Basins. The detention and retention basin designs provided in the Storm Water Quality Handbooks are based upon water quality control, not quantity control. Refer to the Caltrans training course manual "Storm Water Management Design" for information related to design consider-ations for peak flood reduction through the use of detention and retention basins.

(2) Groundwater Recharge. In some locations highly permeable underground strata may allow percolation of excess runoff into the ground. Benefits include recharge of underground aquifers and the possible reduction or elimination of conveyance systems along with pollutant removal. Special care must be exercised in areas of high groundwater to avoid potential contamination of the aquifer.

(3) Drainage Easements. In areas where right of way is inexpensive it may be possible to purchase flood easements. These areas are typically used for agriculture and are subject to flooding at any time during specified times of the year. Cooperative agreements with local agencies or flood control districts will typically be necessary.

892.3 Design Considerations

The items presented below describe some of the issues to be considered prior to, and during, the design of any storm water management facility. General issues common to most storm water management strategies that need to be evaluated are:

- Access for maintenance must be provided, and the facility must be maintainable. Storm water control facilities must not become regarded as wetlands themselves, which would require special permits for routine maintenance.
- Facilities should be designed to "blend in" with their surroundings to the greatest extent possible. The district landscape architecture unit should be contacted for assistance.
- The effects of the proposed facility on channel capacities and existing floodways require evaluation. Care must be taken to evaluate the effects related to the delayed release from detention facilities since an increase in downstream peak discharges may result (see Figure 892.3).
- The effects of releasing sediment free "hungry" water into channels and the potential for increased erosion rates downstream must be determined.
- Evaluate the effects of depriving downstream water users (human, aquatic or vegetative) of runoff due to retention, percolation or other diversion.
- Where pollutant control is necessary, first consider source controls. Source controls are less expensive than treatment controls, and will often negate the need, or help limit the size of treatment control facilities.

See Table 892.3 for a comparative assessment of effectiveness and considerations for various BMP's.

Storm water management techniques involving on-site and off-site storage may offer the highway design engineer the more reasonable and responsive solution to problems relative to the handling of excess runoff. The cooperation of other jurisdictions is generally a prerequisite to applying these strategies and

a cooperative agreement is almost always necessary. See Chapter 12 of the AASHTO Model Drainage Manual for additional design criteria for storage facilities.

892.4 Mixing With Other Waste Streams

Storm water runoff from State highways will usually be carried to a receiving body of water without being combined with waste water. Although some combined storm and sanitary sewers do exist, their use should be avoided.

The most common areas of waste stream mixing have been at maintenance stations. These facilities may have combined storm water and wash rack systems. Because of wash water and rinse water, maintenance stations present unique water quality problems from concentrated levels of pollutant loadings. The preferable design has a separate system for the wash rack so that it is not mixed with storm water and rinse water. For additional advice on treatment of concentrated waste streams at maintenance stations, contact the Sanitary Unit in the Office of Structures Design.

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Highway Design Manual

CHAPTER 890
STORM WATER MANAGEMENT

Topic 891 - General

Index 891.1 - Introduction

The term "storm water management" refers to the cooperative efforts of public agencies and the private sector to mitigate, abate, or reverse the adverse results, both in water quantity and water quality, associated with the altered runoff phenomena that typically accompanies urbanization. Storm water management encompasses a number of control measures, which may be either structural or non-structural (including policy and procedural measures) in nature. The control measures utilized to accomplish the desired goals are often referred to as "best management practices", or BMP's.

The legal necessity to implement the various BMP's is based upon a variety of Federal, State and local regulations that set restrictions on water quantity and quality. Engineers are faced with an increasingly complex task in keeping current with changing regulations and accurately assessing the effectiveness of the BMP's in meeting the objectives of the regulations.

A comprehensive storm water management plan must consider both temporary (construction phase) and permanent controls. See Index 110.2 for general policy. Guidance related to temporary controls can be found in The Caltrans Storm Water Quality Handbook, "Construction Contractors Guide and Specifications". For information related to the designers responsibilities in implementing storm water quality controls, and permanent control measures in particular, refer to the Caltrans Storm Water Quality Handbook, "Planning and Design Staff Guide".

For additional information on the subject of storm water management see Volume XII of the AASHTO "Highway Drainage Guidelines, and Transportation Research Board Synthesis No. 174 "Stormwater Management for Transportation Facilities", 1993.

891.2 Philosophy

A drainage philosophy which has prevailed for years is that surface waters should be intercepted, collected, and disposed of as rapidly as possible. The philosophy continues to be applied but can be considered neither responsive nor adequate in much of today's rapidly developing world. Application of this philosophy has been recognized as a causative factor in a number of runoff related damages to public and private property. Unwise handling of runoff has resulted in downstream flooding, erosion, and discharges of sediment and possibly other pollutants to receiving waters.

Although most damages occur as a result of infrequent to rare runoff events, the need to be sensitive to virtually all actions which modify volumes, times of peak discharge, erosion and sediment transport, and discharge of pollution must be addressed. This is necessary since storm waters cross jurisdictional lines and those jurisdictions must cooperate for the general well-being of the public. The results of poor storm water management may take years to become fully apparent.

Caltrans is responsible for mitigation of runoff impacts resulting from the construction, operation and maintenance of its facilities. When runoff impacts result from a Caltrans project, then the cost of mitigating these impacts is a legitimate part of the project cost. Since transportation funds are increasingly limited, and because mitigation of runoff problems can be expensive, it is important to identify the causative factors and responsible parties. When runoff impacts are caused by others, avenues for assigning these costs to the responsible party should be evaluated. The local agencies responsible for land use in the area are a good place to begin this evaluation, as many of these local agencies have enacted land use regulations in an effort to control flooding. These regulations often require that developers limit changes in the volume and rate of discharge between the pre- and post-development site

conditions. In addition, many local agencies must be responsive to their own storm water permits which require that they implement programs to control the quality of storm water discharges within their jurisdiction. When run-off impacts are caused jointly by Caltrans and others, it may be possible to develop cooperativetive agreements allowing joint impact mitigation. See Indexes 803.2 and 803.3 for further discussion on cooperative agreements and up-grading of existing highway drainage facilities.

891.3 Regulations

The enabling legislation for federal storm water management regulations are contained in the 1972 Water Pollution Control Act, and its subsequent amendments. In 1990 the U.S. Environmental Protection Agency (EPA) regulations expanded the National Pollutant Discharge Elimination System (NPDES) to include storm water runoff as a pollutant source requiring permit. These regulations affect how we address the quality of storm water discharges.

In California, the EPA has delegated its authority to issue NPDES permits to the State Water Resources Control Board (SWRCB) and nine Regional Water Quality Control Boards (RWQCB's). The SWRCB issued two general permits; the General Permit for Storm Water Discharges Associated with Construction Activity and the General Permit for Storm Water Discharges Associated with Industrial Activity. The construction general permit applies to all Caltrans construction projects resulting in 2 or more hectares of soil disturbance. The RWQCB's issued a number of NPDES permits to individual districts: these permits set forth local requirements for the discharge of storm water from Caltrans facilities located in the District. Therefore, each Caltrans district is often responsible not only for complying with the various general permit requirements, but also for negotiating with their respective RWQCB's to limit the local permit requirements to reasonable and practicable levels. The District Hydraulic Engineer, in addition to the Headquarters Environmental Program, should play an active role in reviewing any proposed permitting action and provide input prior to finalization.

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California State Department of Transportation

Highway Design Manual (HDM)

CHAPTER 890 -STORM WATER MANAGEMENT

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R0070682

WEF Manual

AN APPROACH FOR ESTIMATING STORMWATER QUALITY CAPTURE VOLUME. Estimating a Maximized Water Quality Capture Volume. Whenever local resources permit, the stormwater quality capture volume may best be found using continuous hydrologic simulation and local long-term hourly (or lesser time increment) precipitation records (see Chapter 3). However, it is possible to obtain a first-order estimate of the needed capture volume using simplified procedures that target the most typically occurring population of runoff events.

Figure 5.3 contains a map of the contiguous 48 states of the U.S. with the mean annual runoff-producing rainfall depths superimposed (Driscoll *et al.*, 1989). These mean depths are based on a 6-hour interevent time to define a new storm event and a minimum depth of 2.5 mm (0.10 in.) of precipitation for a storm to produce incipient runoff. After an extensive analysis of a number of long-term precipitation records from different meteorological regions of the U.S., Guo and Urbonas (1995) found simple regression equations to relate the mean precipitation depths in Figure 5.3 to "maximized" water quality runoff capture volumes (that is, the knee of the cumulative probability curve).

The analytical procedure was based on a simple transformation of each storm's volume of precipitation to a runoff volume using a coefficient of runoff. To help with this transformation, a third-order regression equation, Equation 5.1 (Urbonas *et al.*, 1990), was derived using data from more than 60 urban watersheds (U.S. EPA, 1983). Because the data were collected nationwide over a 2-year period, Equation 5.1 should have broad applicability in the U.S. for smaller storm events.

$$C = 0.858i^3 - 0.78i^2 + 0.774i + 0.04 \qquad (5.1)$$

Where

C = runoff coefficient, and
i = watershed imperviousness ratio; namely, percent total imperviousness divided by 100.

Equation 5.2 relates mean precipitation depth taken from Figure 5.3 to the "maximized" detention volume. The coefficients listed in Table 5.4 are based on an analysis of long-term data from seven precipitation gauging sites located in different meteorological regions of the U.S. The correlation of determination coefficient, r^2, has a range of 0.80 to 0.97, which implies a strong level of reliability.

$$P_0 = (a \cdot C) \cdot P_6 \qquad (5.2)$$

Where

P_0 = maximized detention volume determined using either the event capture ratio or the volume capture ratio as its basis, watershed in. (mm);

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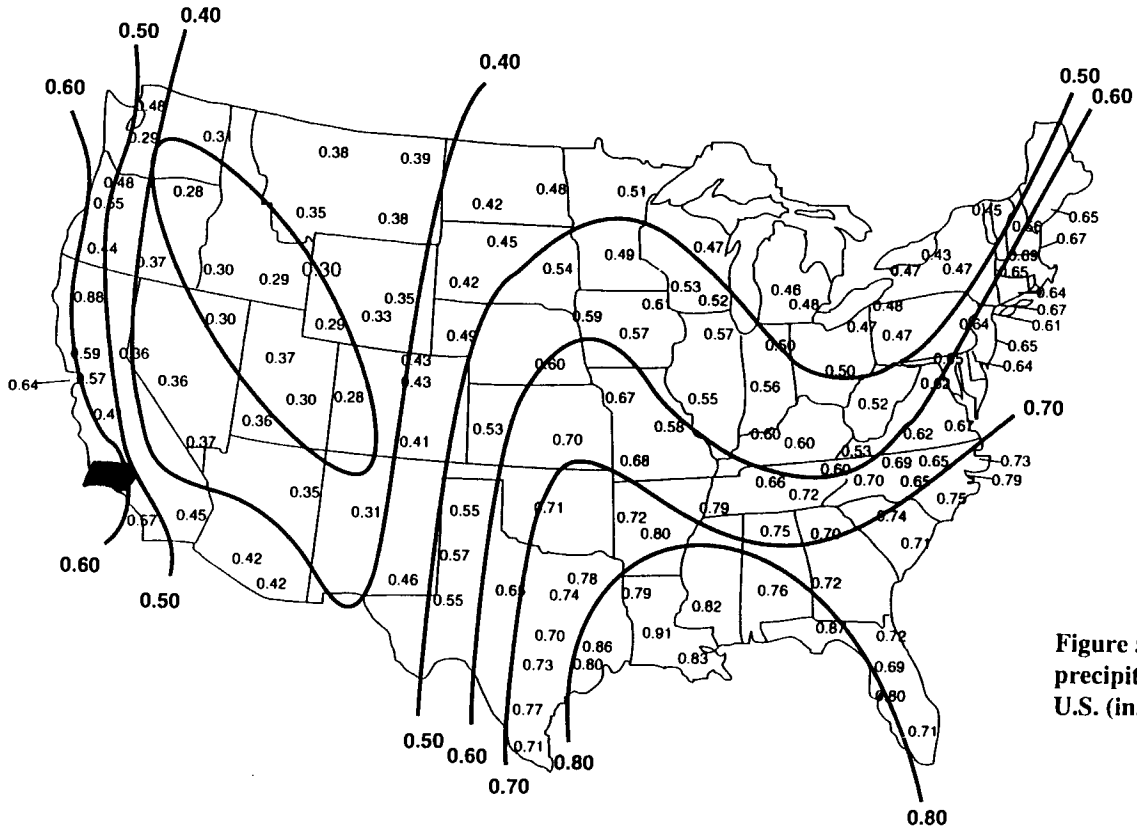

Figure 5.3 Mean storm precipitation depth in the U.S. (in. [in. × 25.4 = mm]).

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Table 5.4 **Values of coefficient a in Equation 5.2 for finding the maximized detention storage volume (Guo and Urbonas, 1995).**[a]

		Drain time of capture volume		
		12 hours	24 hours	48 hours
Event capture ratio	a =	1.109	1.299	1.545
	r^2 =	0.97	0.91	0.85
Volume capture ratio	a =	1.312	1.582	1.963
	r^2 =	0.80	0.93	0.85

[a] Approximately 85th percentile runoff event (range 82 to 88%).

a = regression constant from least-squares analysis;
C = watershed runoff coefficient; and
P_6 = mean storm precipitation volume, watershed in. (mm).

Table 5.4 lists the maximized detention volume/mean precipitation ratios based on either the ratio of the total number of storm runoff events captured or the fraction of the total stormwater runoff volume from a catchment. These can be used to estimate the annual average maximized detention volume at any given site. All that is needed is the watershed's runoff coefficient and its mean annual precipitation.

The actual size of the runoff event to target for water quality enhancement should be based on the evaluation of local hydrology and water quality needs. However, examination of Table 5.3 indicates that the use of larger detention volumes does not significantly improve the average annual removal of total suspended sediments or other settleable constituents. It is likely that an extended detention volume equal to a volume between the runoff from a mean precipitation event taken from Figure 5.3 and the maximized event obtained using Equation 5.2 will provide the optimum-sized and most cost-effective BMP facility. A BMP sized to capture such a volume will also capture the leading edge (that is, first flush) of the runoff hydrograph resulting from larger storms.

Runoff volumes that exceed the design detention volume either bypass the facility or receive less efficient treatment than do the smaller volume storms and have only a minimal net effect on the detention basin's performance. If, however, the design volume is larger and has an outlet to drain it in the same amount of time as the smaller basin, the smallest runoff events will be detained only for a brief interval by the larger outlet. Analysis of long-term precipitation records in the U.S. shows that small events always seem to have the greatest preponderance. As a result, oversizing the detention can cause the most frequent runoff events to receive less treatment than provided by properly designed smaller basins.

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WET POND

pg. 5-18

$P_{mean} = 0.67"$

$\forall = 0.1675 \times A = 0.1675 (240,000) = 40,200\ ft^3$

Based on 80% TSS removal $= 300,696$ gal.

SWALE - VEGETATIVE

For 2-yr storm, S = 3%, Grass ht. - 4"

Swale size = 1000 ft^2/acre

$= 5.51 (1000) = 5510\ ft^2$

$\simeq$ 3' W all around the 500' x 480' site

Max. 1-yr storm event = 1.02 in/hr. (City SD Design Isohyetal)

24-hr, 2-yr storm @ USC = 2.27 inches (LA County Data)

R0070686

Runoff Volume Calculations.

Area, $A = 240{,}000\ ft^2 = 5.51\ ac.$

Imperviousness, $i = 100\% = 1.0$

a) WEF Manual of Practice #23 (pg. 175)

Using 85th percentile event capture for 24 hrs.

$$P_o = a C P_6$$

$a = 1.299$ (Table 5.4)

$P_6 = 0.67$ in (Fig. 5.3)

$$C = 0.858 i^3 - 0.78 i^2 + 0.774 i + 0.04$$

$$= 0.858(1)^3 - 0.78(1)^2 + 0.774(1) + 0.04 = 0.89$$

$$\Rightarrow P_o = 1.299\,(0.89)^{0.67} = 0.7745 \text{ in.} = 0.065 \text{ ft.}$$

$$\Rightarrow \text{Reqd. volume} = P_o A = 0.065 \text{ ft} (240{,}000\ ft^2)$$

$$= 15{,}492\ ft^3 = 115{,}879 \text{ gal.}$$

b) California Stormwater BMP Handbook (pg. D-1)

Using 85th percentile capture for 40 hrs. for L.A. region.

Required volume = 0.06 ac-ft/ac. × 5.51 ac

for 100% DCIA = 0.3306 ac-ft

= 107,719 gal. ≈ 40′ × 40′ × 9′D

For a single orifice outlet, $Q = 0.1$ cfs for 40 hrs.

$V = 8$ ft/sec.

$a_o = 0.012\ ft^2$

APPENDIX D

Appendix D is used for sizing infiltration facilities (TC 1) and extended detention basins (TC 5). The sizing criteria was determined using the Storage, Treatment, Overflow, Runoff Model (STORM) as developed by the U.S. Corp of Engineers. STORM was applied to long-term, hourly rainfall data at fifteen (15) rain gauges across the State. Based on this analysis nine gauges were selected as being representative for sizing detention storage facilities (see Figure D.1). Zones were drawn to reflect these nine gauges taking into consideration rainfall data and topography. The sizing curves should apply to most areas within each zone. However, the zone boundaries are approximate and certain areas within each zone will be strongly influenced by topographic features.

Each sizing curve was developed using the following parameters:

- A drawdown time from the entire storage volume of 40 hours. This drawdown time allows quiescent conditions to establish in the basin, resulting in at least 80% sediment removal for most soils in California.

- Initial abstraction/depression storage on impervious surface of 0.06 inch.

- Runoff coefficient of 0.9 for impervious surfaces and 0.15 for pervious surfaces.

Appendix D may be used in the following manner:

1. Identify the appropriate zone for your location from Figure D.1 and Table D.1 and then select the appropriate detention storage figure for your zone.

2. Determine for the drainage area the percentage of impervious area directly connected to the storm drain system. Directly connected impervious area (DCIA) is defined as the area covered by pavement, building, and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

3. Choose a capture goal, and read the required unit volume required for the basin. In selecting the capture goal consider the requirements of the local municipality or a point at the "knee of the curve". Once the capture goal has been established draw a horizontal line from the capture goal to the appropriate DCIA curve, then a vertical line to the unit storage volume.

4. Multiply the unit volume times the total acreage of the drainage area and convert to acre-feet or cubic feet.

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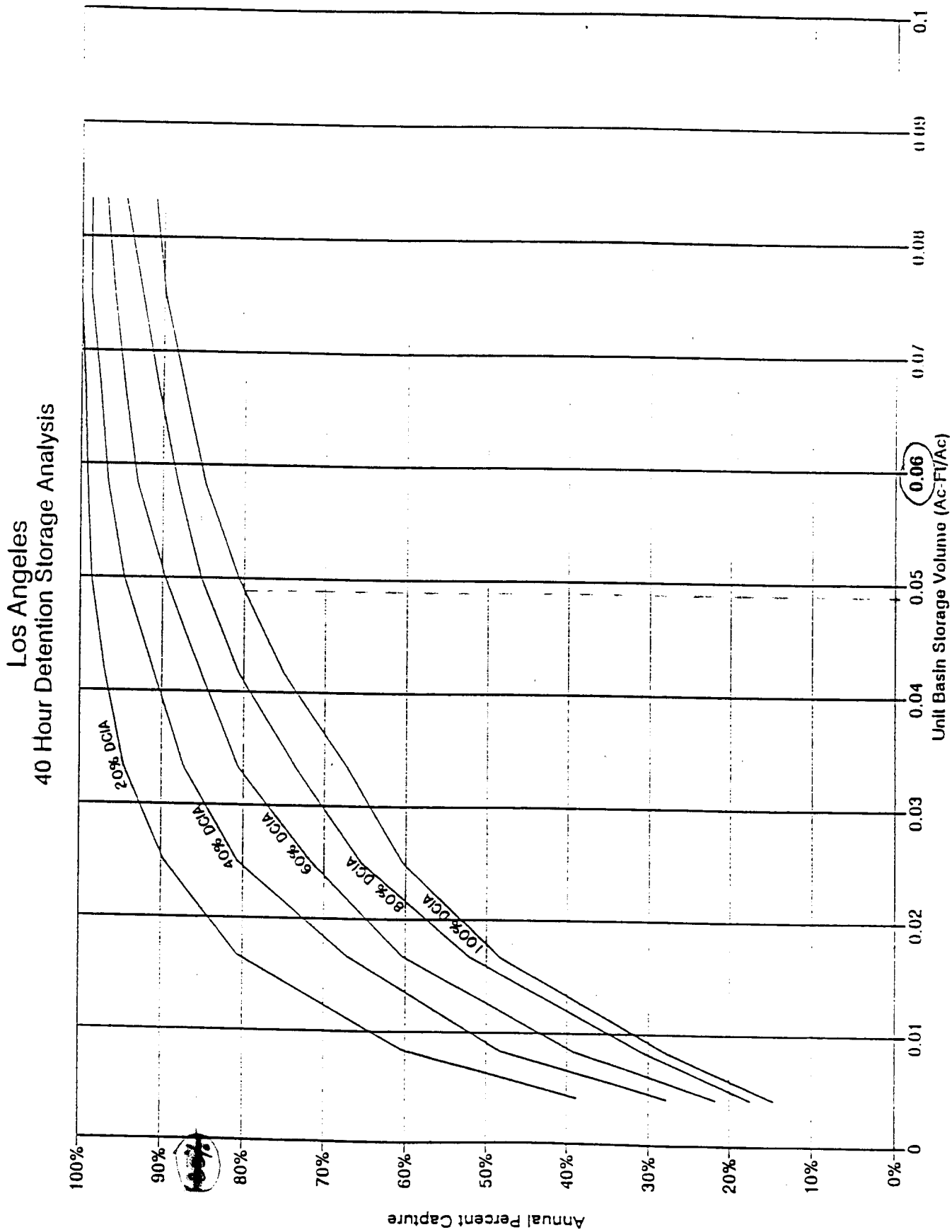
Los Angeles
40 Hour Detention Storage Analysis
Annual Percent Capture
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
Unit Basin Storage Volume (Ac-Ft/Ac)
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA

R0070689

APPENDIX D

Appendix D is used for sizing infiltration facilities (TC 1) and extended detention basins (TC 5). The sizing criteria was determined using the Storage, Treatment, Overflow, Runoff Model (STORM) as developed by the U.S. Corp of Engineers. STORM was applied to long-term, hourly rainfall data at fifteen (15) rain gauges across the State. Based on this analysis nine gauges were selected as being representative for sizing detention storage facilities (see Figure D.1). Zones were drawn to reflect these nine gauges taking into consideration rainfall data and topography. The sizing curves should apply to most areas within each zone. However, the zone boundaries are approximate and certain areas within each zone will be strongly influenced by topographic features.

Each sizing curve was developed using the following parameters:

- A drawdown time from the entire storage volume of 40 hours. This drawdown time allows quiescent conditions to establish in the basin, resulting in at least 80% sediment removal for most soils in California.
- Initial abstraction/depression storage on impervious surface of 0.06 inch.
- Runoff coefficient of 0.9 for impervious surfaces and 0.15 for pervious surfaces.

Appendix D may be used in the following manner:

1. Identify the appropriate zone for your location from Figure D.1 and Table D.1 and then select the appropriate detention storage figure for your zone.
2. Determine for the catchment area the percentage of impervious area directly connected to the storm drain system. Directly connected impervious area (DCIA) is defined as the area covered by pavement, building, and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).
3. Choose a capture goal, and read the required unit volume required for the basin. In selecting the capture goal consider the requirements of the local municipality or a point at the "knee of the curve". Once the capture goal has been established draw a horizontal line from the capture goal to the appropriate DCIA curve, then a vertical line to the unit storage volume.
4. Multiply the unit volume times the total acreage of the catchment basin and convert to acre-feet or cubic feet.

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GENERAL ZONES WITHIN CALIFORNIA FOR SELECTING DETENTION/INFILTRATION SIZING CURVES

ZONE	AREA	GAGE
1	Inland Empire: Western San Diego, Riverside, San Bernardino Counties	Riverside City Experimental Station (#7473)
2	Mojave Desert: Eastern San Diego, Riverside, San Bernardino, Los Angeles, Kern Counties	Thermal Airport - Federal Aviation Administration (#8892) and Fire Station 39 (#8893)
3	Southern Coastal: Los Angeles, Orange, Ventura Counties	Los Angeles International Airport - Weather Service Office (#5114)
4	Central and Northern Coastal: Santa Barbara, San Luis Obispo, Monterey, Santa Cruz, Santa Clara, San Mateo, San Francisco, Alameda, Contra Costa, Western Solano, Napa, Marin, Sonoma, Mendocino, Trinity and Humboldt Counties	Oakland Airport - Weather Service Office (#6335)
5	Southern Central Valley: Kern County	Bakersfield Airport - Weather Service Office (#442)
6	Mid-Central Valley: Kings, Western Fresno, Western Tulare, Western Madera, Merced, and Mariposa Counties	Fresno Airport - Weather Service Office (#3257)
7	North Central Valley: Stanislaus, San Joaquin, Sacramento, Eastern Solano, Yolo, Colusa, Lake, Glenn, Tehama, Butte, Western Nevada, and Yuba Counties	Sacramento - Weather Service Office (#7633)
8	Owens Valley: Mono and Inyo Counties	Bishop Airport - Weather Service Office (#822)
9	Sierra: Del Norte, Siskiyou, Modoc, Shasta, Lassen, Plumas, Sierra, Eastern Nevada, Placer, El Dorado, Amador, Calaveras, Tuolume, Mariposa, Eastern Madera, Eastern Fresno, and Eastern Tulare Counties	Truckee (#9043)

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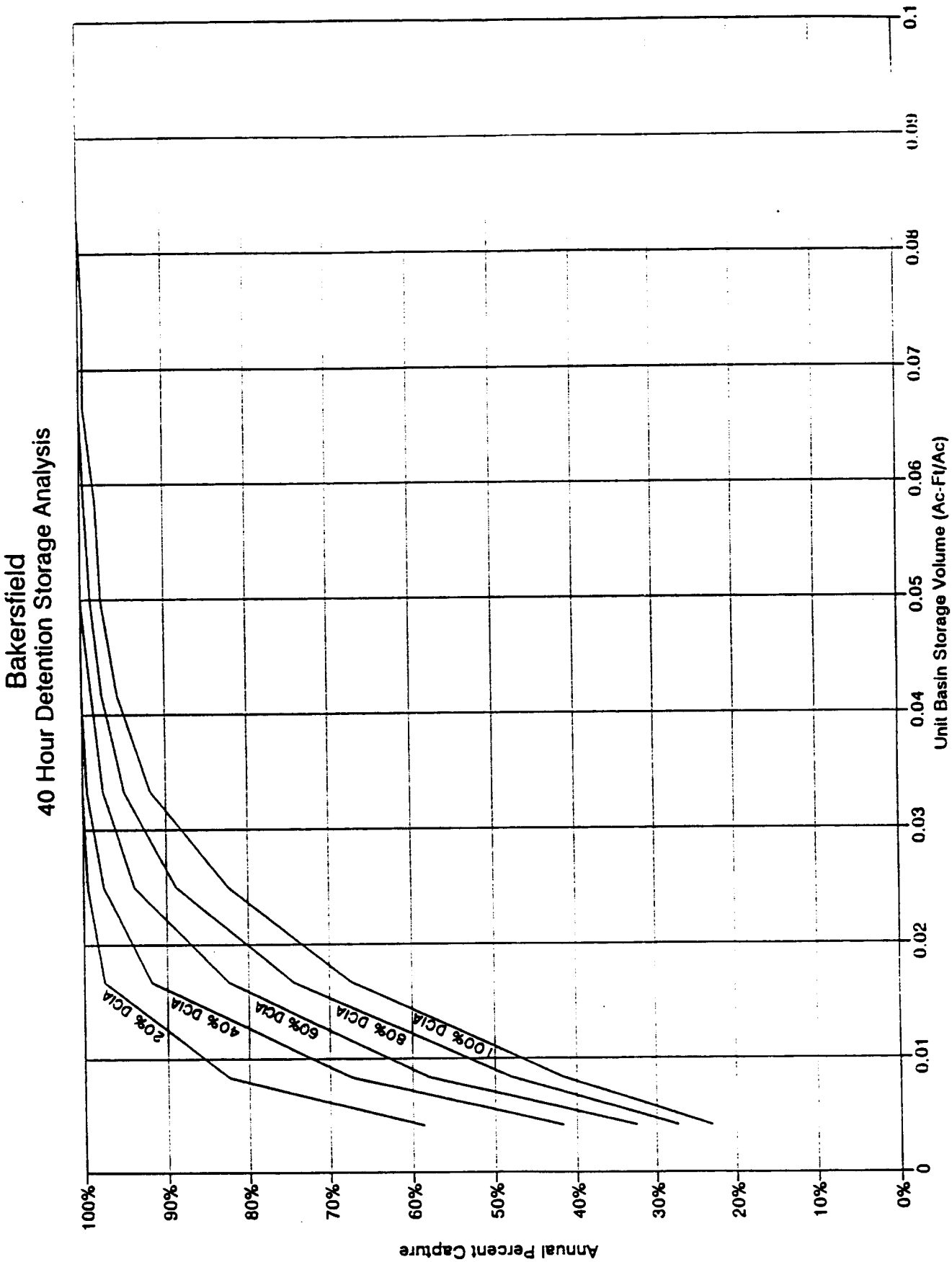
Bakersfield
40 Hour Detention Storage Analysis
Annual Percent Capture
Unit Basin Storage Volume (Ac-Ft/Ac)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
100% DCIA
80% DCIA
60% DCIA
40% DCIA
20% DCIA

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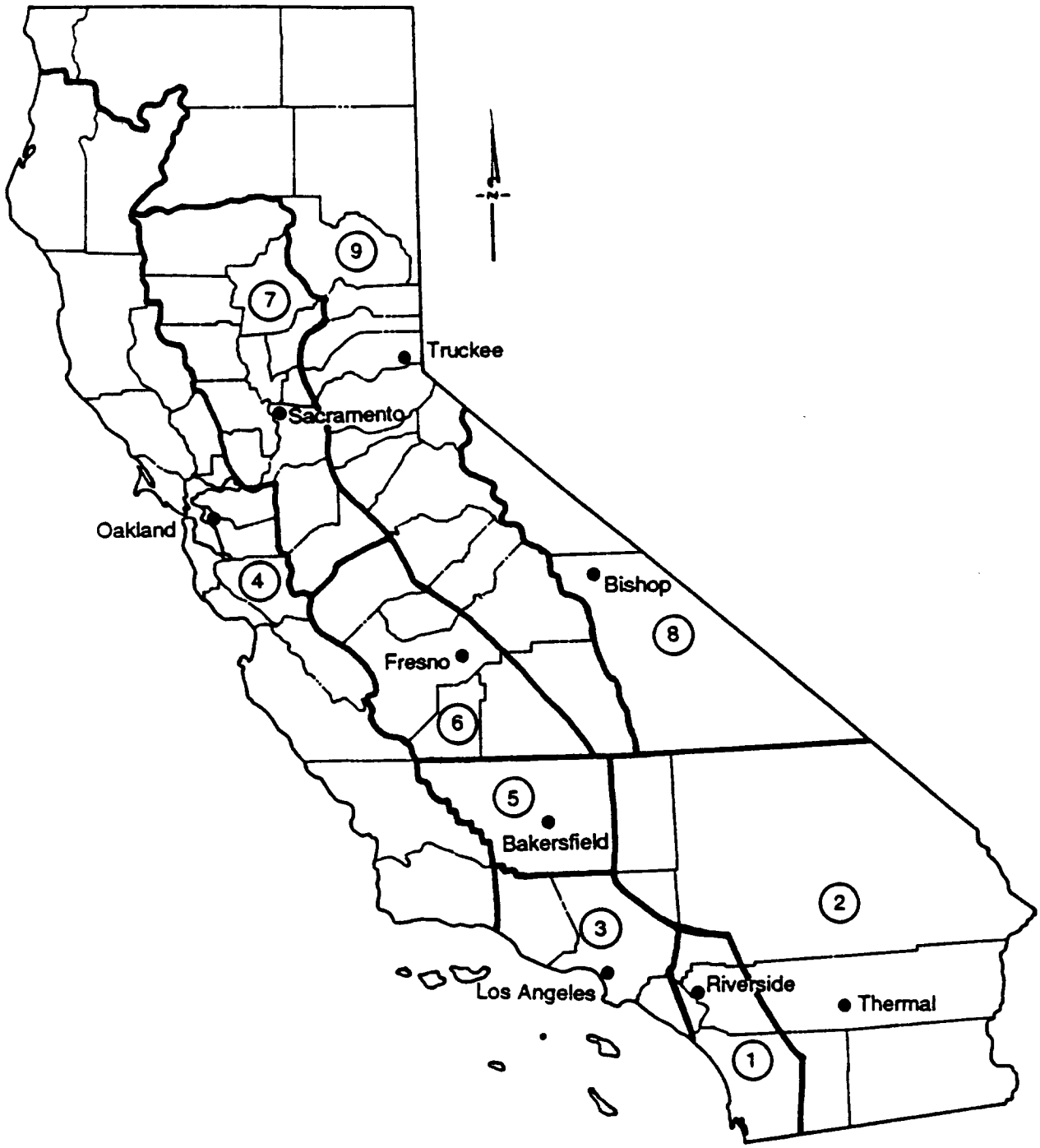

FIGURE D1. LOCATIONS OF RAIN GAGES USED FOR SIZING DETENTION/ INFILTRATION BASINS

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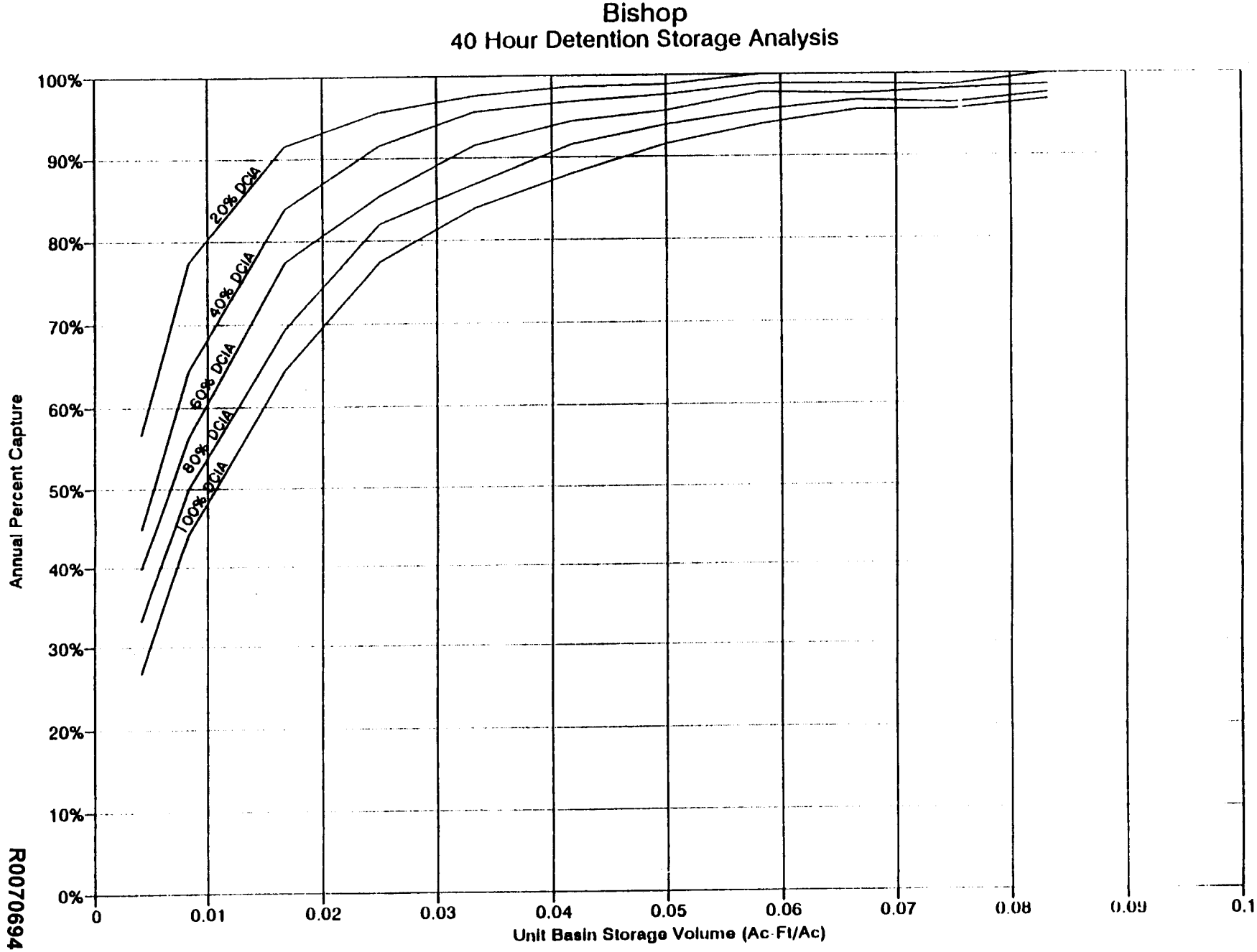
Bishop
40 Hour Detention Storage Analysis
Annual Percent Capture
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
Unit Basin Storage Volume (Ac-Ft/Ac)

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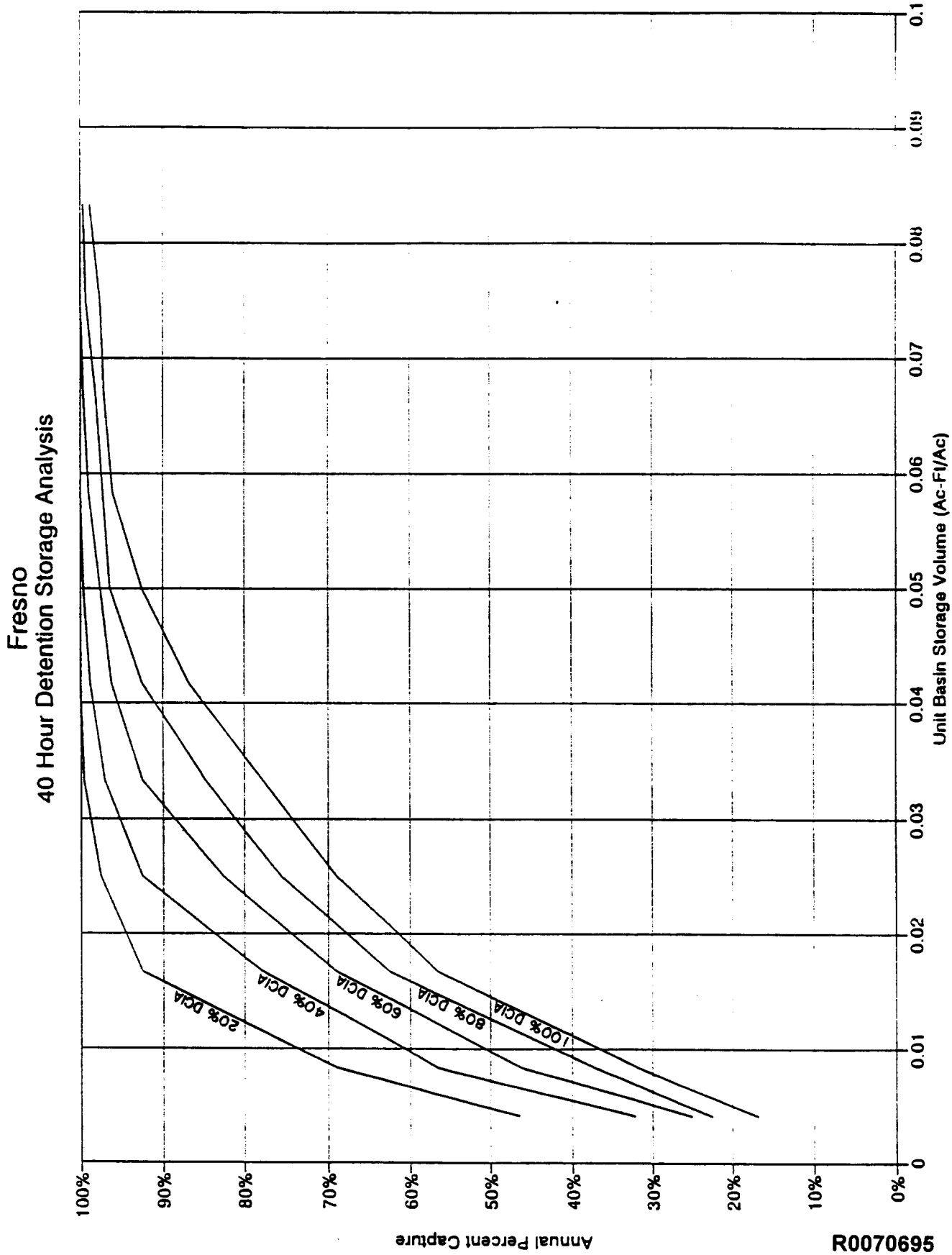
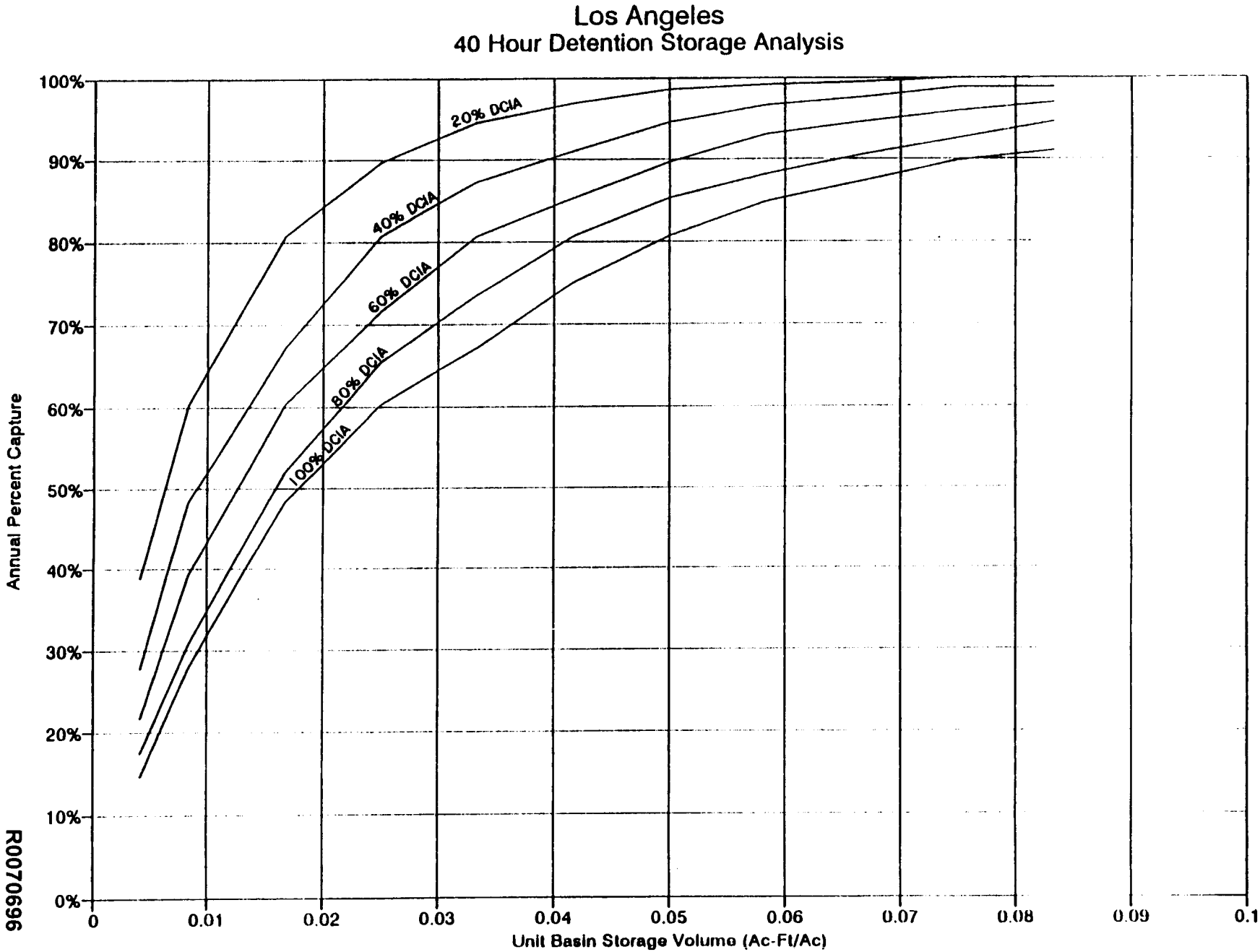

Fresno
40 Hour Detention Storage Analysis
Annual Percent Capture
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Unit Basin Storage Volume (Ac-Ft/Ac)
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA
R0070695


Los Angeles
40 Hour Detention Storage Analysis
Annual Percent Capture
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
20% DCIA
40% DCIA
60% DCIA
80% DCIA
100% DCIA
0
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.1
Unit Basin Storage Volume (Ac-Ft/Ac)

R0070696

Oakland WSO Airport
40 Hour Detention Storage Analysis

R0070697

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

ADMINISTRATIVE RECORD INDEX

VOLUME Water Quality References

A. STATEWIDE

1. California Industrial/Commercial Storm Water Inspection Program Handbook, March 1996, Alameda County

2. Compilation of New Development Stormwater Treatment Controls in the San Francisco Bay Area Final Report. June 1997. Bay Area Stormwater Management Agencies Association

3. California's Rivers and Streams - Working Toward Solutions(1998?), Cal/EPA & State Water Resources Control Board

4. California Storm Water Best Management Practice Handbooks - Industrial/Commercial. March 1993, California Storm Water Quality Task Force

5. California Storm Water Best Management Practice Handbook - Construction Activity. March 1993, California Storm Water Quality Task Force

6. California Storm Water Best Management Practice Handbook – Municipal Camp. March 1993. California Storm Water Quality Task Force

7. Erosion and Sediment Control Handbook. May 1978, Department of Conservation Resources Agency

8. Non-point Source Management Program, Urban Runoff Technical Advisory Committee Report and Recommendations, November 1994, State Water Resources Control Board

9. Start at the Source: *Design Guidance Manual for Stormwater Quality Protection.* 1999, Bay Area Stormwater Management Agencies Association

10. Water Quality Assessment - 1996, State Water Resources Control Board

B. FEDERAL

11. EPA, Final Report of the Nationwide Urban Runoff Program, December 1993

12. EPA, Guidance Specifying Management Measures for Sources of Non-point Pollution in Coastal Waters, Document No. EPA-840-B-92-002, 1993

Because of the extensive volume of material that comprises this Administrative Record, the Regional Board reserves the right to introduce additional documents that may have been inadvertently left out at this time.

13. EPA, National Water Quality Inventory, 1992 Report to Congress, 1992

14. EPA, Selected Urban Storm Water Runoff Abstracts, July 1968 - June 1970

15. EPA, Seminar Publication, National Conference on Urban Runoff Management: Enhancing Urban Watershed Management at the Local, County, and State Levels, March 30 - April 2, 1993

16. Estuaries on the Edge: The Vital Link Between Land and Sea, 1996 American Oceans Campaign

17. Guidance on Stormwater Drainage Wells Draft for Review, Version 2.07. July 1997. EPA Office of Groundwater and Drinking Water

18. Guidance manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity Document No. USEPA 505/8-91-002, April 1991 USEPA Office of Water (EN-336)

19. Handbook on Urban Runoff Pollution Prevention and Control Planning – Document No. EPA (625/R-93/004), September 1993 USEPA Office of Research and Development Washington DC 20460

20. Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems - A User's Guide Document No. EPA/600/R-92-238, January 1993, EPA Office of Research and Development Washington, DC 20460

21. National Water Quality Inventory - 1994 Report to Congress USEPA 841-R-95-005, December 1995 EPA Office of Water Washington, D.C.

22. Northern Virginia Soil and Water Conservation District, USEPA Department of Water. Developing Successful Runoff Control Programs for Urbanized Areas Final Report. Fairfax, Virginia. July 1, 1994

23. NPDES Storm Water Sampling Guidance, Document No. EPA 833-B-02-001, July 1992 EPA Office of Water (EN - 336)

24. NRDC, Poison Runoff: A Guide to State and Local Control of Non-point Source Water Pollution, April 1989

25. Pollution Program Affiliates, Inc. Water: The Challenge of Cleansing Rivers and Oceans, April 7, 1994

26. The Rensselaerville Institute. The EPA Stormwater Management Program Report, Vol. 1. October 1992

27. Saving Bays and Estuaries: A Handbook of Tactics, Document No. USEPA 503/8-88-001, June 1988 EPA Office of Marine and Estuaries Protection

Because of the extensive volume of material that comprises this Administrative Record, the Regional Board reserves the right to introduce additional documents that may have been inadvertently left out at this time.

28. A State and Local Government Guide to Environmental Program Funding Alternatives, Document No. EPA 841-K-94-001, January 1994 EPA Office of Water (4503F)

29. Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System Storm Water Program - Report to Congress, Document No. EPA 833-K-94-002, March 1995 EPA Office of Water (4203)

30. Storm Water Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices, Document No. ? USEPA Office of Water (WH-547)

31. Terrene Institute Washington, D.C., Urbanization and Water Quality: A Guide to Protecting the Urban Environment, March 1994

32. Treatment and Disposal of Hazardous Waste, Hazardous and Toxic Wastes Associated with Urban Storm Water Runoff, Document No. EPA 600-9-90-037 Remedial Action, 1990 EPA & Pitt and Field

33. Urban Storm Water Toxic Pollutants: Assessments, Sources, and Treatability, Stormwater NPDES Related Monitoring Needs Torno, Harry C., Editor,1995

34. Urban Stormwater Quality Enhancement - Source Control, Retrofitting, and Combined Sewer Technology, Torno, Harry C., Editor

35. Urban Soil Erosion and Sediment Control Committee, Guidelines for Urban Erosion and Sediment Control, October 1991

36. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Economic Valuation of Natural Resources: A Handbook for Coastal Resource Policymaker, June 1995

37. US Department of Commerce, Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality, National Technical Information Service, September 1986

38. USEPA Office of Water, Coastal Nonpoint Pollution Control Program-Development and Approval Guidance, January 1993

39. USEPA Office of Water, Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990, Washington DC, January 1993

40. USEPA Office of Water. Municipal Wastewater Management Fact Sheets Stormwater Best Management Practices. Washington D.C. September 1996

41. USEPA Region V. National Conference on Urban Erosion and Sediment Control: *Institutions and Technology*. January 1980

42. USEPA, Region 5 (Water Division, Wetlands and Watershed Section, Watershed Management Unit), USEPA Office of Wastewater Enforcement and Compliance Permit Division NPDES Program and Stormwater Section, Urban Runoff Management Information/Education Products

43. USEPA, Storm Water Management for Industrial Activities - Developing Pollution Prevention Plans and Best Management Practices, Document No. USEPA 832-R-92-006, September 1992

44. Water-Supply Paper 2363: Techniques for Estimation of Storm-Runoff Loads, Volumes, and Selected Constituent Concentrations in Urban Watersheds in the United States. Washington D.C. 1990. United States Geological Survey Driver, Nancy E. & Tasker, Gary D

45. Watershed Management Institute and Terrene Institute in Cooperation with USEPA, Fundamentals of Urban Runoff Management: Technical and Institutional Issues, August 1994

C. LOS ANGELES REGIONAL

46. An Assessment of Inputs of Fecal Indicator Organisms and Human Enteric Viruses from Two Santa Monica Storm Drains - Technical Report, Santa Monica Bay Restoration Project, June 1990

47. An Assessment of Monitoring and Data Management Needs in Santa Monica Bay - Final Report, Submitted to The Santa Monica Bay Restoration Project, Southern Cal. Coastal Water Research Project and EcoAnalysis, Inc., May 13, 1991

48. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. II (Review of Water and Wastewater Sampling Techniques with an Emphasis on Stormwater Monitoring Requirements), Stenstrom Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

49. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. III (Surface Drainage Water Quality Monitoring Program Plan), Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

50. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. IV (Selection of Best Management Practices for Control of Storm Water Pollution to Santa Monica Bay), Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

51. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. I (Annual Pollutant Loadings to Santa Monica Bay from Storm Water Runoff), Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

52. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. V (Toxicity of Dry Weather Urban Runoff), Lau, Simlin and Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Steven Bay from Southern California Coastal Water Research Project, June 14, 1994

53. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, Adopted by CRWQCB, LA Region, June 13, 1994

54. Caltrans District 7 - Stormwater Monitoring Summary Report, Tetra Tech, Inc.

55. Chemical Contaminant Releases into Santa Monica Bay (Executive Summary Based on a Pilot Study), Environmental Health Sciences UCLA, School of Public Health, American Oceans Campaign, June 1993

56. Chemical Contaminant Release into The Santa Monica Bay: A Pilot Study, Environmental Health Sciences UCLA, School of Public Health, Final Report to American Oceans Campaign, June 12, 1993

57. Electronic Data Print Out, BPTC Sites Region 4 LA Harbor

58. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica By - Final Report, Santa Monica Bay Restoration Project, May 7, 1996

59. Heal the Bay - 1993 State of the Marina Report, Marina Del Rey, Bower Aimee and Gorke Roger, July 9, 1993

60. Heal the Bay 1993 Third Annual Beach Pollution Report Card, Gorke Roger with technical review by Gold Mark, 1993

61. The Hydraulic/Water Conservation Division Los Angeles County Department of Public Works: Hydrologic Report, 1987-1988

62. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1988-1989

63. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1990-1991

64. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1991-1992

65. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1993-1994

66. Illicit Discharge Investigation Approach, Ventura Countywide Stormwater Quality Management Program, February 1995

67. Los Angeles Petition of NRDC for Review of Stormwater/Urban Runoff Discharge Permit (Order No. 90-79), Los Angeles Regional Water Quality Control Board Response, October 19, 1990

68. Los Angeles County 1997-98 Stormwater Monitoring Report. Los Angeles County Department of Public Works, SCCWRP, & Woodward-Clyde Consultants. July 10, 1998

69. Los Angeles County Drainage Area Review - Draft Feasibility Report, US Army Corps of Engineers, Los Angeles District, September 1991

70. Los Angeles County Department of Public Works: Waste Management Division, NPDES Permit No. CA0061654 (Phases II and III) - Proposed Stormwater/Urban Runoff Monitoring Program (Mass Emissions Sites), 1994

71. Marine Studies of San Pedro Bay, California Part 2-H - The Marine Environment of marina Del Rey, Harbors Environmental Projects University of Southern California,

72. Marine Studies of San Pedro Bay, California, Part 20F -The Marine Environment of Marina Del Rey (A Report to the Department of Beaches and Harbors, County of Los Angeles), Jones Burton H.; Oguri, Mikihiko; and Soule, Dorothy F., Harbors Environmental Projects University of Southern California, March 1991

73. The Metropolitan Water District of Southern California - Annual Report, MWD - Fiscal year July 1, 1988 to June 30, 1989, 1989

74. The Metropolitan Water District of Southern California - Annual Report, MWD - Fiscal Year July 1, 1989 to June 30, 1990, 1990

75. National Research Council, Monitoring Southern California's Coastal Water, 1990 October 1991 - June 1992

76. Newport Bay Watershed: Construction Activities/Best Management Practices Plan for Sediment Control, Boyle Engineering Corporation - Water Resources Division, Technical Memorandum - November 1981

77. NPDES Permit No. CA0061654 - Santa Monica Bay Drainage Basin (Proposed Stormwater/Urban Runoff monitoring Program), Los Angeles County Dept. of Public Works: Waste Management Division Water Quality Management Section, August 17, 1993

78. Pie Grant, Brash Industries, Dec. 30, 1995

79. Port of Long Beach - Nonpoint Source Storm Water Program, Presented to the LA Regional Water Quality Control Board, July 19, 1994

80. Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration: *Cooperative Agreement No. CR819573.* Clark, Shirley, Parmer, Keith & Pitt, Robert, Department of Civil and Environmental Engineering. Cincinnati, Ohio. May 1994

81. Quality and Beneficial Use Investigation of the Los Angeles River: Prospects for Restored Beneficial Uses, Danza, James M. Water Environmental Studies M.S., California State University, Fullerton, June 1994

82. Report of Stormwater Monitoring Winter of 1994-1995, Los Angeles County Public Works, March 1996

83. Review of Monitoring and Response Protocol for the Malibu Creek Watershed, Santa Monica Bay Restoration Project - Report, Trim Heather, November 1994

84. Santa Monica Bay Stormwater Pollutant Reduction Study, Engineering-Science for City of Los Angeles Wastewater Program Management Division, December 1987

85. Santa Monica Bay Restoration Project, Progress Update 1990, 1990

86. The Santa Monica Bay Restoration Project, Ozone Disinfection and Treatment of Urban Storm Drain Dry-Weather Flows: A Pilot Treatment Plant (Demonstration on the Kenter Canyon Storm Drain Systems in Santa Monica), Greene, Gerald E., Associate Civil Engineer, June 1992

87. The Santa Monica Bay Restoration Project, Pathogens and Indicators in Storm Drains Within the Santa Monica Bay Watershed, June 1992

88. Santa Monica Bay Characterization Study, MBC Applied Environmental Sciences, Santa Monica Bay Restoration Project, April 1993

89. Santa Monica Bay Restoration Project, Public Summary of the Santa Monica Bay Restoration Plan, December 1994

90. Santa Monica Bay Restoration Plan- The Coastal Watersheds, Santa Monica Bay Restoration Project, September 1994

91. Santa Monica Bay Stormwater Pollutant Reduction Study: Volume I Study Results and Recommendation, Engineering-Science City of Los Angeles Wastewater Program Management Division, June 1994

92. Santa Monica Bay Stormwater Pollutant Reduction Study: Volume I Study Results and Recommendation, Engineering-Science City of Los Angeles Wastewater Program Management Division, June 1994

93. Santa Monica Bay Area Municipal Storm Water/Urban Runoff Pilot Project-Evaluation of Potential Catch Basin Retrofits. San Diego, CA, Psomas & Associates, UCLA, & Woodward-Clyde for Santa Monica Cities Consortium September 1998

94. State Coastal Conservancy, Los Angeles River - Park and Recreation Area Study, December 1993

95. Storm Drains as a Source of Surf Zone Indicators and Human Viruses to Santa Monica Bay. August 1991

96. Storm Runoff in Los Angeles and Ventura Counties, Final Report- Los Angeles California Regional Water Quality Control Board, Los Angeles, California Regional Water Quality Control Board, 1988

97. Southern California Coastal Water Research Project - Annual Report, 1987

98. Southern California Coastal Water Research Project - Annual Report, 1987

99. Southern California Coastal Water Research Project (SCCWRP), Annual Report 1990-1991 and 1991-1992, November 1992

100. Ten-Year Data Summary 1977-1987, California State Mussel Watch, May 1988

101. Toxic Substances Monitoring Program, Ten Year Data Summary 1978-1987, August 1990

102. Toxicity of Stormwater Runoff in Los Angeles County - Annual Report, Southern California Coastal Water Research Project, 1988-1989

103. UC Davis Final Report Site Specific Study for Effluent Dominated Streams (San Gabriel River, Santa Clara River, Calleguas Creek), April 18, 1994

104. UCLA Storm Water Pollution Control Transportation Industries Outreach and Education, June 8, 1995

105. USDA - Natural Resources Conservation Service, Malibu Creek Watershed Natural Resources Plan (Draft), March 1995

106. Ventura Countywide Stormwater Quality Management Program Annual Report, Sheydayi, Alex, Chair of Management Committee, September 1995

107. Waterbodies, Wetlands, and their Beneficial Uses in the Los Angeles Region (4) - A Report Presented to LA Regional Water Quality Control Board - Volume 1, Hanes, Ted L.; Lloyd, William J.; Saint, Prem K., California State University, Fullerton, July 1993

108. Waterbodies, Wetlands, and their Beneficial Uses in the Los Angeles Region (4) - A Report Presented to LA Regional Water Quality Control Board - Volume 2, Hanes, Ted L.; Lloyd, William J.; Saint, Prem K., California State University, Fullerton, July 1993

D. WATER PROGRAM GUIDANCE FROM OTHER AREAS

109. 1994 Puget Sound Water Quality Management Plan, Puget Sound Water Quality Authority, May 18, 1994

110. 1997 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, 1997

111. 1998 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, Portland, 1998

112. 1999 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, 1999

113. Action Plan Demonstration Project: Demonstration of Gasoline Fueling Station Best Management Practices, Final Report, Submitted to U.S. Environmental Protection Agency, Region IX, October 1994

114. Actions Speak Louder than Legislation - Positive Experiences Provide Direction for Urban Runoff Management, Water Environment and Technology, January 1996

115. Advances in Modeling the Management of Stormwater Impacts, Guelph, Ontario, 1996

116. Analysis of Urban BMP Performance and Longevity - Final Report Dept. of Environmental Programs, Metropolitan Washington, Council of Govt., August 1992

117. Better Site Design: A handbook for Changing Development Rules in Your Community for the Site Planning Roundtable, Center for Watershed Protection Ellicott City, Maryland, August 1998

118. Blueprint for a Clean Bay - Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities, Bay Area Stormwater Management Agencies Association, 1995

119. Best Management Practices for Storm Water and Industrial Sanitary Sewer Pollution Control: Non-Point Source Pollution Control Program, Santa Clara County

120. Caltrans, Storm Water Runoff Management Literature Review, March 1996

121. Center for Watershed Protection Silver Springs, Maryland. Site Planning for Urban Stream Protection, Schueler, Tom, December 1995

122. City and County of San Francisco Department of Public Works: Best Management Practices Study, August 1992

123. The Clock is Ticking to Comply with New Stormwater Regulations, Forrest, Carol L. and Oakley, Monica M., March 1991

124. A Consortium of Local Agencies Best Management Practices for Industrial Storm Water Pollution Control, Alameda County Urban Runoff Clean Water Program

125. Compost Stormwater Filter Evaluation, Everett, WA., Leif, William T. P.E. Snohomish County Department of Public Works, January 1999

126. Comprehensive Watersheds Ordinance for City of Austin, TX, 1986

127. Controlling Toxic Pollution in Urban Storm Water Runoff - Options for Local Government, August 1988

128. A Current Assessment of Urban Best Management Practices - Techniques for Reducing Nonpoint Source Pollution in the Coastal Zone, Anacostia Restoration Team Department of Environmental Programs Metropolitan Washington Council of Governments, March 1992

129. Developing Successful Runoff Control Programs for Urbanized Areas, Fairfax Virginia, North Virginia Soil District, July 1, 1994

130. Design for Change- Vision, Value, Community, 1996 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, 1996

131. Design of Stormwater Filtering Systems for Chesapeake Research Consortium, Clayton, Richard A. & Schueler. Thomas R., Center for Watershed Protection Silver Spring MD, December 1996

132. Design of Urban Runoff Quality Controls, New York, New York, Roesner, Larry A., Sonnen, Michael B., & Urbonas Ben. 1989

135. The Economics of Stormwater BMP's in the Mid-Atlantic Region. Brown, Whitney & Shcueler, Thomas. Center for Watershed Protection Silver Springs, Maryland. August 1997

136. Good Practices to Protect Our Creeks and Bay - Guidelines for Restaurants, Grocery Stores, Cafeterias, Bakeries, and Delicatessens, Santa Clara Valley Nonpoint Source

137. Impervious Surface Reduction Study - Final Report - Water Resources Program, City of Olympia Dept. of Public Works, May 1995

138. Impervious Surface Reduction Study - Executive Summary- Water Resources Program, City of Olympia Dept. of Public Works, January 1996

139. The Importance of Imperviousness, Watershed Protection Techniques, Vol. 1, Number 3, Fall 1994

140. Industrial Stormwater Pollution Control Compliance - A Comprehensive Source Book for Federal, State, and Regional Regulatory Requirements and Information Resources, Santa Clara Valley Nonpoint Source Pollution Control Program, December 1992

141. Modern Methods for Modeling the Management of Stormwater Impacts, Guelph, Ontario, 1995

142. Municipal Storm Water Management, Ann Arbor, Debo, N. Thomas & Reese, J. Andrew. 1995

143. National Stormwater Best Management Practices Database Version 1.0, American Society of Civil Engineering, June 1996

144. The New Federal Stormwater Regulations, Public Works (City, County and State), February 1991

145. North Natomas Drainage Design and Procedures Manual, City of Sacramento Department of Utilities, July 1998

146. Opportunities in Sustainable Development: Strategies for the Chesapeake Basin, Hill, Margaret, American Society of Landscape Architects, March 1997

147. Orange County - NPDES Stormwater Permit Program Proposed Monitoring Program Orange County Flood Control District, The County of Orange and Its Twenty - Nine Incorporated Cities, February 20, 1991

148. Orange County NPDES Stormwater Program: Drainage Area Management Plan, Submitted to the San Diego and Santa Ana Regional Water Quality Control Boards, April 1993

149. Performance Measures for the National CSO Control Program, AMSA: Association of Metropolitan Sewerage Agencies, January 1996

150. Rapid Watershed Planning Handbook: A Comprehensive Guide for Managing Urbanizing Watersheds for the USEPA, Office of Wetlands Oceans and Watersheds & Region V, Center for Watershed Protection Ellicott City, Maryland, October 1998

151. Results: A Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study Project N. S2498, Western States Petroleum Association and American Petroleum Institute, September 26, 1994

152. Riverside County Flood Control and Water Conservation District (NPDES Municipal Stormwater Application for Permit Renewal) Flood Control District, Santa Ana Watershed, County and Cities of Riverside County, January 3, 1995

153. Santa Clara Valley Nonpoint Source Study. Vol. 1: Loads Assessment Report (Final Report), February 22, 1991

154. Santa Clara Valley Non-Point Source Program - Proposed Storm Water Management Plan, Section 9, December 20, 1994

155. Second Nature: Adapting LA's Landscape for Sustainable Living, Lipkis, Andy, Treepeople, 1999

156. Sediment Removal in Catch Basins and Catch Basin Inserts, Everett, WA., Leif, William T. P.E. Snohomish County Department of Public Works, March 1998

157. Stormwater Management: Pond Design Example for Extended Detention Wet Pond, Clayton, Richard A. Jr., P.E., Center for Watershed Protection Ellicott City, Maryland, December 1995

158. Storm Water Best Management Practices for Retail Gasoline Outlets Western States Petroleum Association, Project No. S2498, January 12, 1996

159. Stormwater Discharges: Regulatory Compliance and Best Management Practices, New York, Dennison, Mark S. 1996

160. Stormwater Management Manual for the Puget Sound Basin - The Technical Manual Washington State Department of Ecology, February 1992

161. Stormwater Strategies: Community Responses to Runoff Pollution. Clarke Aponte, George P., Cameron, Diane M., Frank, Andrew G., & Lehner, Peter H. Natural Resources Defense Council, May 1999

162. Summary Report: Vehicle Service Facility Waste Minimization Program, 1993

163. Training Seminar, Storm Water Compliance: Municipal Techniques and Strategies, American Public Works Association California Chapter, December 10, 1993

164. Thermal Impacts Associated with Urbanization and Stormwater Management, Best management Practices: Appendices, Dubose, Robert & Galli, John, Department of Environmental Programs, Metropolitan Washington Council of Governments, December 1990

165. Thermal Impacts Associated with Urbanization and Stormwater Management, Best management Practices: Final Report, Galli, John Department of Environmental Programs, Metropolitan Washington Council of Governments, December 1990

166. Urban Drainage and Flood Control District. Urban Storm Drainage Criteria Manual Vol. 3: Best Management Practices. Denver, Colorado. September 1, 1999

167. Urban Hydrology: *A Multidisciplinary Perspective*. Lancaster, Pennsylvania. Lazaro, Timothy R., 1990

168. Urban Runoff Quality Management: *WEF Manual of Practice No. 23 & ASCE Manual and Report on Engineering Practice No. 87.* Alexandria, Virginia, American Society of Civil Engineers, 1998

169. Urban Storm Drainage - Criteria Manual Vol. 3 (Best Management Practices), Urban Drainage and Flood Control District, Denver, Colorado, September 1992

170. Urban Stormwater: An Overview for Municipalities, Public Works, December 1990

171. Water Quality Best Management Practices Manual - For Commercial and Industrial Businesses, Resource Planning Associates, June 30, 1989

172. Water Quality Protection for Automotive Businesses - 1st Edition Business Partners for Clean Water, November 1990

173. Western States Petroleum Association, Service Station Storm Water Runoff Study Contract No. DT 308-02, October 5, 1993

E. APPLICABLE LAWS AND POLICIES

174. Attorney's General's Statement for the State National Pollutant Discharge Elimination System Program and State Pretreatment Program, State of California Office of the Attorney General, May 1987

175. Code of Federal Regulations Part 122 July 1, 1992

176. Comparison of Los Angeles County Draft Storm Water Permit with Similar Permits in Orange and Santa Clara Counties, March 25, 1996

177. Comparative Cost of the LA County Storm Water Management Program, CRWQCB Los Angeles Region, July 9, 1996

178. Draft Interim Permitting Approach For Water Quality-Based Effluent Limitations In Storm Water Permits, June 10, 1996

179. Economic Benefits of Runoff Controls, EPA, September 1995

180. Environmental Impacts of Stormwater Discharges: A National Profile, EPA, June 1992

181. EPA - Interpretative Policy Memorandum on Re-application Requirements for Municipal Separate Storm Water Sewer Systems, May 17, 1996

182. EPA National Water Quality Inventory, 1994 Report to Congress - Executive Summary, 1994

183. Federal Register Environmental Protection Agency 40 CFR Parts 122, 123, 124, and 504 National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Proposed Rule, December 7, 1988

184. Federal Register Environmental Protection Agency, 40 CFR Parts 122, 123, and 124 National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges Final Rule, November 16, 1990

185. Guidance Manual For The Preparation Of Part 2 Of The NPDES Permit Applications For Discharges From Municipal Separate Storm Sewer System, USEPA, November 1992

Because of the extensive volume of material that comprises this Administrative Record, the Regional Board reserves the right to introduce additional documents that may have been inadvertently left out at this time.

186. Letter from EPA to Regional Board, November 16, 1989

187. Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy. USEPA Document No. 800-R-96-002. (see Table of Contents attached), May 1996

188. Memo regarding compliance with Water Quality Standard in NPDES Permits Issued to Municipal Separate Storm Sewers Systems, t, E. Donald, Asst. Adm. & General Counsel, U.S. EPA, January 9, 1991

189. Memo addressed to Archie Matthews (Division of Water Quality) regarding compliance with Coverage of State Highways Under Municipal Storm Water Permits, Jennings, Elizabeth, Senior Staff Counsel, December 2, 1992

190. Memo addressed to William H. Crooks (Executive Officer) regarding compliance with Municipal Storm Water for Stockton, April 23, 1993

191. Memorandum addressed to Storm Water Permit Program Coordinators - Municipal Storm Water Management Plan Components, September 8, 1994

192. Memo addressed to Water Management Division Directors Region I - X regarding compliance with Storm Water Enforcement Strategy, January 12, 1994

193. Memo addressed to Regional Water Board (Executive Officer) regarding compliance with Transmittal of the Final Storm Water Compliance Strategy - California Storm Water Compliance and Enforcement Strategy, March 3, 1994

194. Memo addressed to Urban Runoff Task Force regarding compliance with Non-storm Water Discharges -- Municipal Permits, April 7, 1995

195. Memo Addressed to Bruce Fujimoto (Division Of Water Quality) regarding Municipal Storm Water Permits: Compliance With Water Quality Objectives, Jennings, Elizabeth of SWRCB, October 3, 1995

196. Memo addressed to Catherine Tyrrell, et al. regarding legal issues Raised in Draft Storm Water WDR's/NPDES Permit for LA County, et al., Leon, Jorge SWRCB Senior Staff Counsel, January 10, 1996

197. NPDES Memorandum of Agreement Between the USEPA and CSWRCB

198. NPDES Storm Water Program Question and Answer Document Volume 2, USEPA

199. Results of the Nationwide Urban Runoff Program, Executive Summary, USEPA, December 1983

200. Role of Municipalities in the Implementation of State General NPDES Permits for Storm Water Associated with Industrial Activity to Maryann Jones, SWRCB, USEPA Region 9, Bromley, Eugene, December 1993

201. State Water Resources Control Board - Order No. WQ 91-03, State of California

202. State Water Resources Control Board - Order No. WQ 91-04, State of California

Because of the extensive volume of material that comprises this Administrative Record, the Regional Board reserves the right to introduce additional documents that may have been inadvertently left out at this time.

STANDARD STORM WATER MITIGATION PLANS

WORKSHOP

August 10, 1999,
1:30 – 4:30

Conference Rooms A and B, Main Building
Los Angeles County Department of Public Works
900 South Fremont Avenue, Alhambra

1. Welcome and Introductions – Dennis Dickerson, Executive Officer, Regional Water Quality Control Board [10 min]

2. Numerical Measures for Storm Water Mitigation – Overview – Dr. Robert Brashear, Camp Dresser McKee [25 + 5 min]

3. Development Planning – Program Implementation in the Bay Area – Diane Pierce, Alameda County Clean Water Program [25 + 5 min]

4. Development Planning – Program for the Unincorporated area of Los Angeles County – Tim Piasky, Los Angeles County Department of Public Works [20 + 5 min]

5. Break [15 min]

6. Countywide Standard Urban Stormwater Mitigation Plans – Overview – Los Angeles County Department of Public Works, Tim Piasky [10 min]

7. Standard Urban Stormwater Mitigation Plans – Issues of Concern to Permittees – Tom Kennedy, Los Angeles Countywide Permit Subcommittee [25 min]

8. Questions and Comments – Xavier Swamikannu/ Dennis Dickerson, Regional Water Quality Control Board [30 min]

9. Wrap-up – Dennis Dickerson, Regional Water Quality Control Board [5 min]

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Development Planning Workshop
August 10, 1999

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8-11-1999 7:21AM FROM LACDPW-WATER QUALITY 626 458 3534 P.7

R0070723

OUTLINE FOR DISCUSSION

I. **NPDES Permit CAS614001 Part 2.III.A.1.c (Development of SUSMPs)**

   A. Efficient Irrigation not included b/c it is an exempt discharge.

II. **Development of SUSMPs based on Permit, comments received from Permittees and interested parties, and with some consultation with from experts in the field.**

III. **Sources of Information (design manuals, developers, experts in the field)**

IV. **Subcommittee Issues**

   A. "0.6 inches of rainfall from impervious directly connected areas"
   B. Scientific justification for implementation of BMPs when their effectiveness is uncertain.
   C. Maintenance.
   D. Laundry list of RWQCB approved recommended BMPs list.
   E. Less prescriptive requirements.
   F. How will increasing pervious areas help reduce pollution in stormwater runoff.
   G. Maximum extent practicable.
   H. Loading docks.

V. **Differences between County's and Permittees' version of the SUSMPs**

   A. 0.6 inches vs. 0.75 inches of rainfall to be mitigated.
   B. Definition of redevelopment.
   C. CDS on list of BMPs
   D. Mitigate Stormwater Runoff was only included for 100+ Home Subdivisions, 10-99 Home Subdivisions, and 100,000+ Commercial Developments in the Permittee versions.

VI. **Other Perspectives**

   A. Development Community
   B. Implementation

VII. **August 10, 1999 Development Planning Workshop**

July 15, 1999

In development of these SUSMPs we received comments and/or consulted with:

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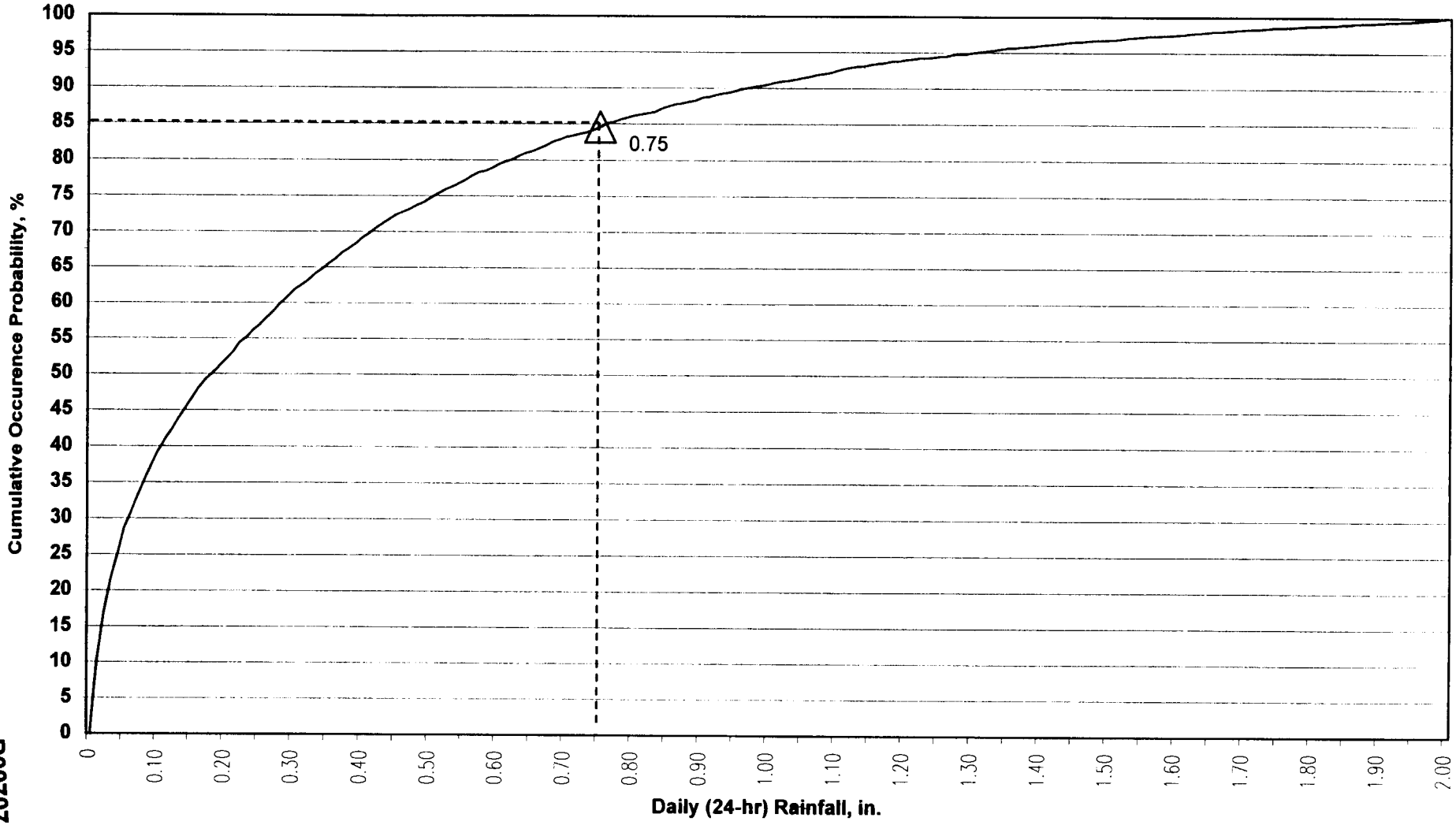
CDM (Don Schroeder)
Robert Bein, William Frost & Associates (Scott Taylor)
Dr. Fred Lee
Dr. Richard Horner
Valencia Company/Newhall Land and Farming (Jane Nelson and Mark Subbotin)
Building Industry Association (Ray Pearl)
Sikand Engineering Associates
Brash Industries
LA County Regional Planning
Western States Petroleum Association
Larwin Company
Several Permittees (Cities of Vernon, Industry, Downey, Santa Monica, Los Angeles, Long Beach, etc.)

Sources of Information

- ASCE Urban Runoff Quality Management, WEF Manual of Practice No. 23, ASCE Manual and Report on Engineering Practice No. 87.
- California BMP Handbooks (Municipal, Industrial, and Construction)
- Start at the Source (Bay Area Stormwater Management Agencies Association)
- Better Site Design: A Handbook for Changing Development Rules in Your Community (Center for Watershed Protection)
- Design of Stormwater Filtering Systems (Center for Watershed Protection)
- Low-Impact Development Design Manual (Prince George's County, MD)
- Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs (Department of Environmental Programs, Metropolitan Washington Council of Governments)
- Evaluation and Management of Highway Runoff Water Quality (US Department of Transportation)
- Best Management Practice Guide Retail Gasoline Outlets

Raingage No. 716 - Los Angeles - Ducommun Street



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June 17, 1999

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Attn.: Terri M. Grant
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Dear Mr. Stone:

COMMENTS ON DRAFT STANDARD URBAN STORMWATER MITIGATION PLANS

The City appreciates the opportunity to review and comment on the proposed draft Model Standard Urban Stormwater Mitigation Plans (SUSMPs).

The City is concerned that the draft Model SUSMPs appear to be inconsistent with the requirements of the Development Planning Model Program (Model) and the Municipal Stormwater Permit. This inconsistency will create implementation difficulties for all Permittees and needs to be corrected.

The draft Model SUSMPs do not delineate the anticipated pollutants of concern associated with each development category. Evaluation of potential significant impacts associated with each land-use type would better assist Permittees in understanding the pollutants of most concern associated with each land-use category and in selecting the most appropriate Best Management Practices (BMPs). Therefore, the City requests that the draft Model SUSMPs be modified to include information regarding the specific pollutants of concern associated with each of the seven identified land-use categories.

The benefits of pollution prevention and minimization activities and policies are not addressed in the draft Model SUSMPs or provided as an incentive or option to structural considerations. In several cases pollution prevention and minimization activities could have a much more significant benefit to stormwater quality, and overall environmental quality, than any structural BMPs. The City recommends that the Model SUSMPs include appropriate source-control BMPs.

The City understands the time constraints facing all Permittees as well as the County's deadline for

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completing the Model SUSMPs by July 30, 1999. However, we feel the Model SUSMPs is an essential element of achieving stormwater pollution prevention. We request an opportunity to review and provide comments on the revised Model SUSMPs prior to finalization and submittal to the Executive Officer of Los Angeles Regional Water Quality Control Board. We are available to meet with you at your convenience.

Attached, please find the detailed comments on specific BMPs and SUSMPs for your consideration. If you have any questions, please call me or Wing Tam at (213) 847-8346 or (213) 847-5225, respectively.

Sincerely,

Gary Lee Moore, P.E.
Program Manager
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GLM/MS/WKT:bg
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Attachment

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ATTACHMENT

CITY OF LOS ANGELES COMMENTS ON LOS ANGELES COUNTY MODEL STANDARD URBAN STORMWATER MITIGATION PLANS

SUSMPs Requirements for all "Priority Projects"

The draft Model SUSMPs and the transmitting cover letter imply that all projects which fall into the seven development categories listed in Permit Section III.A.1.c are Priority Projects and therefore require SUSMPs. The Permit defines Priority Projects as projects that have been determined to have a potential significant impact on water quality by the Building Official. The City anticipates reviewing all discretionary projects, not just those listed in Permit Section III.A.1.c, for potentially significant water quality impacts, consistent with the California Environmental Quality Act. We are unaware at this point of any water quality information that indicates that all seven development categories included in Permit Section III.A.1.c, regardless of size, previous land use, ecological sensitivity of adjacent or downstream areas, or elements included in proposed project plans, would result in a potentially significant impacts on water quality. Furthermore, depending upon those and other factors, impacts that may be identified are anticipated to vary from project to project even if they are within the same development category. Therefore, it is important that each Permittee have the ability to review discretionary projects and to mitigate significant impacts via SUSMPs.

The draft Model SUSMPs "Background" section needs to be modified to include clarifying language that preserves and reflects the discretion provided to each Permittee in determining if SUSMPs are required for Priority Projects that do not identify significant water quality impacts. The language which indicates that the SUSMPs "must be incorporated into design plans" for all development projects identified in Permit Section III.A.1.c is inconsistent with the requirements of the Permit and needs to be deleted.

Definition of New Improvement and Redevelopment

While the City agrees it is appropriate to consider redevelopment projects in the application of SUSMPs, we suggest that only those discretionary redevelopment projects with significant stormwater quality impacts be subject to stormwater control measures.

Absence of Source-control BMPs

The benefits of pollution prevention and minimization activities and policies are not addressed in the draft SUSMPs or provided as an incentive or option to structural considerations. In several cases, pollution prevention and minimization activities could have a much more significant benefit to stormwater quality and overall environmental quality, than any structural BMP. The City recommends that the Model SUSMPs include appropriate source-control BMPs.

Proposed Run-Off Reduction Requirement

The 0.6-inch rainfall reduction requirement does not demonstrate a clear nexus as to its appropriateness for all land-use types from a stormwater pollution standpoint. The City requests that the 0.6-inches of rainfall be deleted and replaced with the requirement of the Permit: "minimize, to the maximum extend practicable, the amount of stormwater directed to impermeable areas."

From an equitable standpoint, there is a need to regulate like sources equally. Requiring restaurants to reduce run-off by 0.6-inches of rainfall, while not requiring dry-cleaners, industrial facilities, public facilities, hotels, etc. to do the same appears to be arbitrary and capricious. In addition, some existing developments may have a high percentage of permeable surface, and rather than being rewarded for this progressive development planning, upon any redevelopment they will be penalized by being further required to reduce run-off, despite their previous efforts. The run-off reduction requirement would have significant impacts for those individuals proposing to develop open lots, and could ultimately impact redevelopment efforts. The City requests that the County respond to the legal "taking" issues associated with the proposed run-off reduction requirement and investigate the potential impacts of the requirement on redevelopment programs. In addition, an environmental evaluation addressing potential pollution transfer from one media to another associated with such a requirement should be undertaken.

Comments on Specific SUSMP/BMP

Reducing Post-Development Runoff: Selection of the treatment control BMPs is to be made by considering the characteristics of the land uses first. Several of the selected BMPs are not appropriate for some of the land-use categories. For example, none of the infiltration type BMPs, e.g. Permeable Pavements, Vegetated Swale, Vegetated Strips, Extended Detention Basin, etc., are to be included in the commercial facilities such as Auto Shop or Retail Gasoline Outlet because spilled hazardous material from these facilities may infiltrate ground with stormwater runoff. These and other infiltration type BMPs should be limited to non-commercial land uses where probability of contamination from spilled pollutants is low.

In addition, from an equitable standpoint, BMP requirements should be tailored to the degree of pollution potential within same category of projects based on their size or level of activities. For example, an Auto Shop that has facilities to repair 5 cars a day clearly do not contribute as much pollutant as the one that repairs 20 cars a day. For further information, please see Appendix D of the Model.

Protect Slopes and Channels: Flexibility in application of different slope stabilization and erosion control measures should be at the discretion of the Permittees, because majority of the Permittees have such requirements adopted in their building codes. Allowing Permittees to tailor their SUSMP requirements so that the BMPs do not conflict with building codes will facilitate implementation of the program.

Single Family Hillside Residence: The given definition of "hillside" significantly alters the meaning as intended in the Development Planning Model Program. This definition should be revised to conform to the Development Planning Model Program.

Properly Design Equipment/Accessory Wash Area: The second bullet doesn't state how the wash water and storm runoff is to be conveyed from the wash area. Requirements for proper connection to sanitary sewer with rain water diversion system should be added.

Properly Design Common Trash Storage Areas: (I) This requirement should only be applicable to outdoor storage of materials that have a potential to pollute stormwater. Outdoor storage of inert material would not have a significant impact on stormwater quality. (ii) The definition given for the "common area" is too broad. It should be narrowed down to include only outdoor material storage area.

Property Design Repair/Maintenance Bays: (I) First bullet should be revised as follows: "Repair/maintenance bays must be indoors or designed in such a way that doesn't allow contact with stormwater and stormwater run-on. (ii) The last sentence of the second bullet should be revised to include the statement that "Industrial Waste Discharge Permit will be required if discharge to sanitary sewer is necessary".

Properly Design Vehicle/Equipment Wash Areas: Include the requirement that wash area must prevent stormwater run-on from the surrounding area with berms or grade break or must have a rain water diversion system.

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

August 12, 1999

IN REPLY PLEASE REFER TO FILE EP-3

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

STANDARD URBAN STORMWATER MITIGATION PLANS

I am writing to clarify the intended meaning of some wording in the Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted to you on July 21, 1999.

At the workshop held on August 10, 1999, regarding SUSMPs, you indicated that the following statement in the SUSMPs would be interpreted to mean that all runoff would need to be mitigated:

> "The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system".

The actual intent of that statement was to omit a numerical standard from the SUSMPs. Enclosed is a revised version of the SUSMPs to clarify the intended meaning.

If you have any questions, please call me at (626) 458-5948, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

TG:sv
P:\EPPUB\WATER\ADMIN\LETTERS\WORKSHOP.WPD

Enc.

cc: All Permittees

Post-it® Fax Note 7671	Date 8/12/99	# of pages ▸ 25
To Dennis Dickerson	From Terri Grant	
Co./Dept. LRWQCB	Co. LACDPW	
Phone # (213) 576-6605	Phone (626) 458-5948	
Fax # (213) 576 6625	Fax (626) 458-3534	

R0070738

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high

enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have *significant impact*" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by

promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)

- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)

- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)

- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)

- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. [illegible]

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. [illegible]

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be

posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROTECTION OF COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

5. PROTECTION AGAINST DISCHARGES FROM TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

K. [illegible]

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. [illegible]

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. [illegible]

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. [illegible]

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

[illegible]

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGNED COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

6. REQUIRED DESIGN FOR COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

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100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Categorization as a commercial development of 100,000 or more square feet will be based on total impermeable area, including parking area, as opposed to lot size or building footprint.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100,000 Square Foot Commercial Development projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECTION OF SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. MINIMIZE STORMWATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.
- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)
- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local

jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

3. PREVENT STORM DRAIN POLLUTION FROM ROOF DRAINAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROTECT DESIGNATED OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

[illegible]

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

[illegible]

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

[illegible]

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. [illegible]

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. [illegible]

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

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100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 8

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LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

TELECOPY COVER SHEET

DATE: 8-5-99

TO:

Name: Xavier SwamiKannu

Agency: RWQCB

Telephone Number: (213) 576-6654

Telecopier Number: (213) 576-6648

FROM:

Name: Tim Piasky

Division: ENVIRONMENTAL PROGRAMS DIVISION - WATER QUALITY SECTION

Telephone Number: (626) 458-3969

Telecopier Number: (626) 458-3534

NUMBER OF PAGES (including cover sheet) 17

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100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

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BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

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→ For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this SUSMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this SUSMP.

Developments that are upgrading or expanding their facility would face significant costs over and above the cost related to the desired upgrade or expansion. In some cases, facing the cost to upgrade the entire facility may stop the project. In situations where facilities are being rented or leased, tenant improvements to one area of the building may trigger additional work to other sections of the building, which may be occupied by another tenant. We can see problems arise such as who would be responsible for the additional cost, the building owner, the tenant requesting the improvements or the other tenant. The bigger problem that we see is that situations like this could cause vacancies. Business may move to another facility that can provide what they need and the initial building is left with a vacancy.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Directing rooftop runoff to vegetated areas will create major erosion in situations involving large industrial buildings.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
- Infiltration basins (Applicability and design criteria to be added)
- Infiltration trenches (Applicability and design criteria to be added)
- Wet ponds (Applicability and design criteria to be added)
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- Oil/Water separators (Applicability and design criteria to be added)
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- Storm drain inserts (Applicability and design criteria to be added)
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2. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING - DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

3. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials the following structural BMPs are required:

We would recommend inserting the following: *that may contribute pollutants to the stormwater conveyance system,*

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

These requirements will be problems for industrial businesses. It will be an enforcement nightmare.

4. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

5. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas and design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

We would recommend that the above be revised as follows:

- *Cover loading dock areas, and/or;*
- *collect, contain and treat materials from these areas prior to discharge, and or;*
- *collect and contain materials from these areas and discharge to the sanitary sewer system subject to the approval of County Sanitation Districts of Los Angeles County (Industrial Waste approval).*
- *Design drainage to minimize run-on and run-off of storm water.*

F.Y.I. – We have several concerns with a requirement of covering "loading dock areas" especially since the "loading dock area" is considered to extend out from the building wall or edge of a loading platform, a sufficient distance to cover the entire length of the trailer. Our concerns are as follows:

- *In situations where there are several dock doors in sequence, it will be necessary to construct intermediate support columns or walls which become subject to damage as tractor trailer rigs back into position.*
- *Substantial additional cost, especially if something is built that is aesthetically pleasing.*
- *Most developers will strive to construct a flat roof cover which is not aesthetically pleasing.*
- *The requirement of covering the entire length of the trailer seems excessive.*

6. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If this area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

We have -/- 1500 businesses in the City. This will be a large task to perform and monitor

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Since the change of ownership of property does not require City approval or involvement, this seems almost impossible to enforce. The City can require this when a property transfer is known to the City, however, this will be very sporadic.

We would suggest that these last two sentences be shown as a separate paragraph, and wondered if it would be possible to give an example of structural BMPs that might be located within a public area. We think that this is referring to structures such as debris basins or sediment basins that would discharge to a storm drain system..

AUTOMOTIVE REPAIR SHOP
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 2

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REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

RETAIL GASOLINE OUTLET
STANDARD URBAN STORM WATER MITIGATION PLAN
Page 5

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Developments that are upgrading or expanding their facility would face significant costs over and above the cost related to the desired upgrade or expansion. In some cases, facing the cost to upgrade the entire facility may stop the project. In situations where facilities are being rented or leased, tenant improvements to one area of the building may trigger additional work to other portions of the building, which may be occupied by another tenant. We can see problems arise such as who would be responsible for the additional cost, the building owner, the tenant requesting the improvements or the other tenant. The bigger problem that we see is that situations like this could cause vacancies. Business may move to another facility that can provide what they need and the initial building is left with a vacancy.

REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.
- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREA

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials the following structural BMPs are required:

We would recommend inserting the following: *that may contribute pollutants to the stormwater conveyance system.*

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

These requirements will be problems for industrial businesses. It will be an enforcement nightmare.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas and design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

We are not sure how loading docks relate to automotive repair shops. Is this in the proper place? In any case, our comments listed for loading docks for 100,00 S.F. commercial developments would also apply here.

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Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If this area is included in the site design, it must meet the following:

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

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RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

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BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
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This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will be need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Restaurant projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this SUSMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this SUSMP.

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Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved and have secondary containment.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

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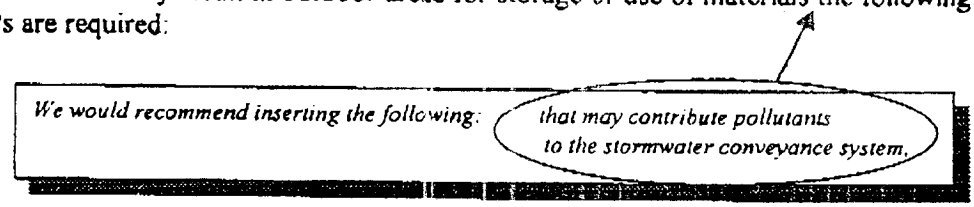

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RESTAURANT
STANDARD URBAN STORM WATER MITIGATION PLAN
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R0070779

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

TELECOPY COVER SHEET

DATE: 8-5-99

TO:

Name: Xavier SwamiKannu

Agency: RWQCB

Telephone Number: (213) 576-6654

Telecopier Number: (213) 576-6640

FROM:

Name: TIM PIASKY

Division: ENVIRONMENTAL PROGRAMS DIVISION - WATER QUALITY SECTION

Telephone Number: (626) 458-5969

Telecopier Number: (626) 458-3534

NUMBER OF PAGES (including cover sheet) 17

REMARKS:

Post-it® Fax Note 7671	Date 8/5/99 # of pages ▶
To XAVIER SWAMIKANNU	From TIM PIASKY
Co./Dept. RWQCB	Co. LACDPW
Phone # (213) 576-6654	Phone # (626) 458-5969
Fax # (213) 576-6640	Fax # (626) 458-3534

fr:\P:\...\ADMIN\CLERICAL\FORMS\FAXSHT

R0070780

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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

July 21, 1999

IN REPLY PLEASE REFER TO FILE EP-3

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Attention Technical Support Unit

Dear Mr. Dickerson:

COMPLIANCE FILE NO. 6948
MUNICIPAL STORMWATER PERMIT NO. CAS614001 - ORDER NO. 96-054
STANDARD URBAN STORMWATER MITIGATION PLANS (SUSMPs)

Enclosed are the Standard Urban Stormwater Mitigation Plans (SUSMPs) for your review and approval. As described in the National Pollutant Discharge Elimination System Permit, Part 2.III.A.1.c, the Principal Permittee, in consultation with the Permittees shall develop SUSMPs for use during planning and permitting of Priority Projects within the following development categories.

- a 100+ home subdivision
- a 10-99 home subdivision
- a 100,000+ square-foot commercial development
- an automotive repair shop
- a retail gasoline outlet
- a restaurant
- a hillside-located single-family dwelling

In addition to including input from the Permittees in the development of these SUSMPs, we twice distributed them to environmental groups, contractors, developers, consultants and applicable trade industries for their review and considered their comments in the development of the SUSMPs.

Also enclosed is a copy of the comments submitted by the City of Los Angeles. They are being sent with the SUSMPs at the City's request.

If you have any questions, please contact Tim Piasky at (626) 458-5969, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

TP:ma
P:\ADMIN\LETTERS\SUSMP2.WPD

Enc.

cc: All Permittees

10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

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For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your

project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness

associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)
- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Categorization as a commercial development of 100,000 or more square feet will be based on total impermeable area, including parking area, as opposed to lot size or building footprint.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100,000 Square Foot Commercial Development projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a

BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples, which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

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Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

AUTOMOTIVE REPAIR SHOP

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

An automotive repair shop is a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Automotive Repair Shop projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. Therefore, design plans which include fueling areas must include the following:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating

anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

9. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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Best Management Practice Guide Retail Gasoline Outlets (1997) Discusses appropriate BMPs for fueling and other closely related activities likely to be found at retail fueling operations.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

R0070826

SINGLE FAMILY HILLSIDE RESIDENCE

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

"Hillside" is as defined by the local jurisdiction. For example, one jurisdiction defines "hillside" as a property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25% or greater, and where grading contemplates cut or fill slopes 30 feet high or greater.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Single-Family Hillside Residence projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to

provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Restaurant projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

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RETAIL GASOLINE OUTLET

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A retail gasoline outlet is primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Retail Gasoline Outlet projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. The project plans must include the following BMPs:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater run-on or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

RECEIVED
JUL 14 1999
BY:----------

July 12, 1999

IN REPLY PLEASE REFER TO FILE: EP-3

Mr. Alex Helperin
Natural Resources Defense Council, Inc.
6310 San Vicente Boulevard, Suite 250
Los Angeles, CA 90048-5426

Dear Mr. Helperin:

PROPOSED STANDARD URBAN STORMWATER MITIGATION PLANS

This is in response to your June 10, 1999, letter about the Standard Urban Stormwater Mitigation Plans (SUSMPs) proposed by the Permittees. Your letter expressed concern that the Permittees are not proposing to adopt the County's Urban Stormwater Mitigation Plans (USMPs).

The SUSMPs that you recently reviewed were developed through a consensus process that included input from all the Permittees. The County's USMPs differ from the current Permittees' version of the SUSMPs because the County has chosen to meet a higher standard with respect to this part of our stormwater program, just as we have in other aspects of the program. However, it is not our role as Principal Permittee of the National Pollutant Discharge Elimination System (NPDES) permit to independently determine for the other Permittees, the Executive Advisory Committee, or the Regional Water Quality Control Board what the Countywide SUSMPs should be.

We would like to clarify your understanding of some specific aspects of the SUSMPs. First, your understanding of "impervious directly connected area" is correct. The SUSMPs do not propose to mitigate runoff from pervious areas or impervious areas that are not directly connected. Also, your letter included the phrase "capturing 80% of the stormwater runoff..." The program was actually meant to mitigate all of the stormwater runoff (infiltrate and/or treat) from 80 percent of the storm events rather than mitigating 80 percent of all stormwater runoff.

The SUSMPs propose that BMPs would mitigate runoff from 0.6 inch of rainfall as 80 percent of all storm events have historically produced 0.6 inch or less of rainfall.

Though the County's and the Permittees' SUSMPs differ, we believe that the SUSMPs represent a reasonable and "practicable" program for all the Permittees. These SUSMPs also provide the flexibility to implement Best Management Practices (BMPs) that are prudent to each cities' individual characteristics.

If you need any clarification, please call me at (626) 458-5948, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Teri M. Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

JP:ma

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cc: Executive Advisory Committee
Development Planning/Construction Subcommittee
Regional Water Quality Control Board (Dennis Dickerson)
URS Greiner Woodward-Clyde (Bob Collacott, Barb Klos)

County Version

100+ HOME SUBDIVISION

URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Urban Stormwater Mitigation Plan (USMP) was developed as part of the program addressing Development Planning for the private sector. This USMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this USMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this USMP.

REQUIREMENTS

1. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.

- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

2. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

<u>Reducing Post-Development Runoff</u>

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Complying with all zoning and applicable ordinances, minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Complying with all zoning and applicable ordinances, reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff, generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
- Infiltration basins (Applicability and design criteria to be added)
- Infiltration trenches (Applicability and design criteria to be added)
- Wet ponds (Applicability and design criteria to be added)
- Constructed wetlands (Applicability and design criteria to be added)
- Oil/Water separators (Applicability and design criteria to be added)
- Catch basin inserts (Applicability and design criteria to be added)
- Storm drain inserts (Applicability and design criteria to be added)
- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Safely convey runoff from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Energy dissipaters, such as riprap, must be installed at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN COMMON[1] OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor common areas for storage or use of materials the following structural BMPs are required:

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

1 Common areas are areas which are designed and intended for active or passive use, or are for the purpose of providing access or services to the owners (or their designees). Examples of common areas are: parking areas, driveways, service areas, recreational amenities such as swimming pools, spas, picnic areas and tables, benches, tot lots, play areas, ball courts, barbecue areas, sitting areas, lawn and grass areas, landscape areas, planter areas, slopes, trails, walkways, and trash areas.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

6. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, County staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the County can provide. It will also encourage the transfer of this information with subsequent sale of the property. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

R0070852

10 - 99 HOME SUBDIVISION

URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Urban Stormwater Mitigation Plan (USMP) was developed as part of the program addressing Development Planning for the private sector. This USMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this USMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this USMP.

REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Complying with all zoning and applicable ordinances, minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Complying with all zoning and applicable ordinances, reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff, generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)

- Extended/dry detention basins (Applicability and design criteria to be added)

- Infiltration basins (Applicability and design criteria to be added)

- Infiltration trenches (Applicability and design criteria to be added)

- Wet ponds (Applicability and design criteria to be added)

- Constructed wetlands (Applicability and design criteria to be added)

- Oil/Water separators (Applicability and design criteria to be added)

- Catch basin inserts (Applicability and design criteria to be added)

- Storm drain inserts (Applicability and design criteria to be added)

- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Safely convey runoff from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Energy dissipaters, such as riprap, must be installed at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN COMMON[1] OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor common areas for storage or use of materials the following structural BMPs are required:

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

5. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

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1 Common areas are areas which are designed and intended for active or passive use, or are for the purpose of providing access or services to the owners (or their designees). Examples of common areas are: parking areas, driveways, service areas, recreational amenities such as swimming pools, spas, picnic areas and tables, benches, tot lots, play areas, ball courts, barbecue areas, sitting areas, lawn and grass areas, landscape areas, planter areas, slopes, trails, walkways, and trash areas.

6. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, County staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the County can provide. It will also encourage the transfer of this information with subsequent sale of the property. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County and will be considered on a case by case basis.

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100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

URBAN STORM WATER MITIGATION PLAN

DEFINITION

Categorization as a commercial development of 100,000 or more square feet will be based on total impermeable area, including parking area, as opposed to lot size or building footprint.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Urban Stormwater Mitigation Plan (USMP) was developed as part of the program addressing Development Planning for the private sector. This USMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100,000 Square Foot Commercial Development projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this USMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this USMP.

REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff, generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
- Infiltration basins (Applicability and design criteria to be added)
- Infiltration trenches (Applicability and design criteria to be added)
- Wet ponds (Applicability and design criteria to be added)
- Constructed wetlands (Applicability and design criteria to be added)
- Oil/Water separators (Applicability and design criteria to be added)
- Catch basin inserts (Applicability and design criteria to be added)
- Storm drain inserts (Applicability and design criteria to be added)
- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

2. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

3. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials the following structural BMPs are required:

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

4. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

5. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas and design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks are prohibited.

6. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If this area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, County staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County and will be considered on a case by case basis.

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AUTOMOTIVE REPAIR SHOP

URBAN STORM WATER MITIGATION PLAN

DEFINITION

An automotive repair shop is a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Urban Stormwater Mitigation Plan (USMP) was developed as part of the program addressing Development Planning for the private sector. This USMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Automotive Repair Shop projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this USMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this USMP.

REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff, generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
- Infiltration basins (Applicability and design criteria to be added)
- Infiltration trenches (Applicability and design criteria to be added)
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- Constructed wetlands (Applicability and design criteria to be added)
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- Storm drain inserts (Applicability and design criteria to be added)
- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. Therefore, design plans which include fueling areas must include the following:

- Fuel dispensing areas must be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREA

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials the following structural BMPs are required:

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

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7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas and design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks are prohibited.

8. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If this area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

9. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, County staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
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Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959
Best Management Practice Guide Retail Gasoline Outlets (1997) Discusses appropriate BMPs for fueling and other closely related activities likely to be found at retail fueling operations.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

RESTAURANT

URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Urban Stormwater Mitigation Plan (USMP) was developed as part of the program addressing Development Planning for the private sector. This USMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Restaurant projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this USMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this USMP.

REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff, generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
- Infiltration basins (Applicability and design criteria to be added)
- Infiltration trenches (Applicability and design criteria to be added)
- Wet ponds (Applicability and design criteria to be added)
- Constructed wetlands (Applicability and design criteria to be added)
- Oil/Water separators (Applicability and design criteria to be added)
- Catch basin inserts (Applicability and design criteria to be added)
- Storm drain inserts (Applicability and design criteria to be added)
- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

2. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.

- If this wash area is to be located outdoors, it must be covered, paved and have secondary containment.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials the following structural BMPs are required:

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, County staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County and will be considered on a case by case basis.

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RETAIL GASOLINE OUTLET

URBAN STORM WATER MITIGATION PLAN

DEFINITION

A retail gasoline outlet is primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Urban Stormwater Mitigation Plan (USMP) was developed as part of the program addressing Development Planning for the private sector. This USMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Retail Gasoline Outlet projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this USMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this USMP.

REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff, generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
- Infiltration basins (Applicability and design criteria to be added)
- Infiltration trenches (Applicability and design criteria to be added)
- Wet ponds (Applicability and design criteria to be added)
- Constructed wetlands (Applicability and design criteria to be added)
- Oil/Water separators (Applicability and design criteria to be added)
- Catch basin inserts (Applicability and design criteria to be added)
- Storm drain inserts (Applicability and design criteria to be added)
- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. The project plans must include the following BMPs:

- Fuel dispensing areas must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREA

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials the following structural BMPs are required:

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If this area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, County staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County and will be considered on a case by case basis.

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SINGLE FAMILY HILLSIDE RESIDENCE

URBAN STORM WATER MITIGATION PLAN

DEFINITION

"Hillside" is as defined by the local jurisdiction. For example, one jurisdiction defines "hillside" as a property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25% or greater, and where grading contemplates cut or fill slopes 30 feet high or greater.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Urban Stormwater Mitigation Plan (USMP) was developed as part of the program addressing Development Planning for the private sector. This USMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Single-Family Hillside Residence projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this USMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this USMP.

REQUIREMENTS

1. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Complying with all zoning and applicable ordinances, minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Complying with all zoning and applicable ordinances, reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff, generated from each and every storm event of up to and including 0.75-inches of rainfall, prior to it discharging into the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
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- Oil/Water separators (Applicability and design criteria to be added)
- Catch basin inserts (Applicability and design criteria to be added)
- Storm drain inserts (Applicability and design criteria to be added)

- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Safely convey runoff from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Energy dissipaters, such as riprap, must be installed at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, County staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the County can provide. It will also encourage the transfer of this information with subsequent sale of the property. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

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Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

Permittee Version

Draft

R0070893

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.

- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.

- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.

- Preserve riparian areas and wetlands.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated ~~from each and every storm event of up to and including 0.6 inches of rainfall~~ from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially

toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated ~~from each and every storm event of up to and including 0.6-inches of rainfall~~ from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)

- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)

- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)

- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

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- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around

the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

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10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Categorization as a commercial development of 100,000 or more square feet will be based on total impermeable area, including parking area, as opposed to lot size or building footprint.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

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For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

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- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples, which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local

jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

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AUTOMOTIVE REPAIR SHOP

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

An automotive repair shop is a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Automotive Repair Shop projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. Therefore, design plans which include fueling areas must include the following:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating

anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

9. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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Best Management Practice Guide Retail Gasoline Outlets (1997) Discusses appropriate BMPs for fueling and other closely related activities likely to be found at retail fueling operations.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Restaurant projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

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- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

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- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

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- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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RETAIL GASOLINE OUTLET

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A retail gasoline outlet is primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Retail Gasoline Outlet projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. The project plans must include the following BMPs:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater run-on or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

SINGLE FAMILY HILLSIDE RESIDENCE

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

"Hillside" is as defined by the local jurisdiction. For example, one jurisdiction defines "hillside" as a property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25% or greater, and where grading contemplates cut or fill slopes 30 feet high or greater.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Single-Family Hillside Residence projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to

provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

MEMORANDUM

August 19, 1999

TO: Ed Schroder, Director of Public Works

FROM: John Hunter

SUBJECT: NPDES Requirements for New Development Projects
Numerical Limits and Anticipated Costs to Developers

The NPDES Development Planning Program will have a significant impact on building developments throughout Los Angeles County. This program requires that Cities review and approve Standard Urban Storm Water Mitigation Plans (SUSMPs) for many types of new developments prior to issuing any approvals to build. In the SUSMPs, developers will describe measures that will be incorporated into the project design to mitigate stormwater pollution in the long term. The exact format and requirements of the SUSMPs are the only major unresolved items of the overall Development Planning Program.

On September 16, 1999, the California Regional Water Quality Control Board will meet to consider approval of "Numerical Limits" for the SUSMPs. Everyone interested in commenting should attend. The Executive Advisory Committee is opposed to the inclusion of the numerical standards due to the lack of baseline receiving water and runoff monitoring data, the unproven cost-effectiveness of the proposed BMPs and the lack of flexibility inherent in a numerical standard (i.e. what is adequate for one development area may not be sufficient for another).

The cities in Los Angeles County have been working together with the County for over two years in developing the current versions of the model programs and SUSMPs. The SUSMPs contained within the Development Planning model program specifically excluded numerical limits, as opposed to the SUSMPs developed by the County for unincorporated areas, which include numerical limits. The establishment of limits at this point may well void a large amount of work that has already been completed and found acceptable to most of the cities involved.

As of July 30, 1999 Los Angeles County began requiring developers in unincorporated areas to include provisions to treat the first flush of rainfall from each storm. The County's standard calls for treatment of the first 0.75 inches of rainfall from each storm. Cities are not automatically obligated to follow the County's standards, however it appears that the Regional Board is leaning towards using it as a model and may incorporate it into the SUSMP requirements for other cities.

92% HIGH DENSITY SINGLE
68% MULTI-FAMILY

The numerical standard would apply to all new priority projects (discretionary 10+home subdivisions, auto repair facilities, restaurants, and 100,000 sq. ft. commercial/industrial developments, etc.). The cost of implementing the standard will vary from site to site depending upon many factors. A typical scenario would be:

- A ¾ inch rain falling on a one acre site with a 100% impervious surface will generate approximately 20,000 gallons of runoff.

80 - 95° ⇒ MOST BASIC

- **Option 1 - Create Retention/Infiltration Area:** At such a site, construction of a sloped (45°) trench 6 feet wide, 3 feet deep and 300 feet long should be sufficient to capture the requisite ¾ inch of rainfall and allow for infiltration. The cost would be roughly

Design and construction cost of the trench including erosion control. On the sides (jute mesh and vegetation) and overflow	$6,500
Land value of the trench (estimated at $10 per square foot).	$18,000*
First years maintenance	$500
Estimated Total	$25,000

*- If setback area is used, land cost will be essentially zero

The maintenance cost included above does not account for the potential for contamination of the underlying soil with metals, hydrocarbons, or solvents that may be discharged with storm water runoff. This possibility depends heavily on the actual use of the property, i.e. residential areas would be less likely to be contaminated than industrial areas. The cost for removal of such contamination, if it occurred, would depend on the amount and concentration of contaminants and the volume of soil affected.

- **Option 2 – Basket Filters Installed in Yard Drains:** Assuming that 4 yard drains will be sufficient for drainage from the site, basket filters can be installed in each drain to remove sediment and any oils or pollutants entrained with the sediment. Absorbent pads can be added to remove dissolved pollutants although the effectiveness of the absorbent for removing pollutants from rainfall is yet to be adequately demonstrated.

Purchase and installation cost of 4 Basket Filters	$2,500*
Absorbent material (if needed)	$1,000
Yearly maintenance	$1,000
Estimated Total	$4,500

* - If not already included in project, drain boxes would add approximately $2,000 to the project cost.

The maintenance costs are based on yearly cleaning and upkeep of the drains and filters. Depending on the use of the property and the presence of

contaminants in storm water runoff, the absorbent material may require replacement on a regular basis, a cost that is not figured into the yearly maintenance figure.

Please note that these estimated costs are based upon vacant land undergoing development. The cost for retrofitting existing facilities undergoing modification could be significantly higher.

In summation:

- New development for restaurants, service stations, major industrial facilities, 10+ home subdivisions, etc. are now required to prepare SUSMPs for the City's review and approval as part of the permit approval process.
- It appears that developers will be required to design and install treatment systems with the capability to capture and treat the first flush (0.6 to 0.75 inches) of rainfall.
- Treatment methods can range from retention and infiltration basins to storm water clarifiers and vegetative swales.
- The SUSMP guidelines are not finalized yet, but may be as early as the regional Board's hearing on September 16, 1999.

Transmitted via Fax - 1 Page

October 20, 1999

TO: Nasser Abbaszadeh, City of Azusa — 626-334-5464
Ed Putz, City of Long Beach— 562-570-6012
Terri Grant, Los Angeles County Public Works— 626-458-3534
Neil Miller, City of Manhattan Beach— 310-546-1752
Tony Nisich, City of Santa Clarita— 661-254-3538
Gary Lee Moore, City of Los Angeles— 213-847-5443
Desi Alvarez, City of Downey— 562-904-7296
Richard Burtt, City of Torrance— 310-618-2822

FROM: Ed Schroder, City of Signal Hill

SUBJECT: Standard Urban Stormwater Mitigation Plans

At the last EAC meeting several cities expressed an interest in obtaining the services of a consultant to prepare an analysis of the Regional Board's proposal to amend the SUSMP we submitted. It was also expressed that we should find someone to make a professional, Power Point-type presentation at the Board meeting when this item is heard.

With the intent of the above in mind, we have scheduled a meeting with Mr. Bob Collacott of URS Greiner Woodward Clyde. The time and location of the meeting is as follows:

Monday, October 25, 1999 - 2:00 p.m.
City of Downey City Hall
Desi Alvarez's office, 2nd floor
11111 Brookshire Avenue, Downey

The purpose of the meeting is to come to a consensus on the content of an analysis and presentation as well as the associated cost. If you cannot make it in person, feel free to send an alternate. However, be prepared to commit to a course of action.

If you have any questions, or wish to discuss the matter, please call me at 562-989-7355, or Desi Alvarez at 562-904-7101

NATURAL RESOURCES DEFENSE COUNCIL

6310 San Vicente Blvd., Suite 250
Los Angeles, CA 90048
323-934-6900
Fax 323 934-1210
E-mail: AHelperin@nrdc.org

FACSIMILE TRANSMITTAL SHEET

This transmission is 4 pages including this cover sheet.
If transmission problems occur, please notify Virginia Calvano or Alex Helperin at (323) 934-6900.

TO: Xavier Swamikannu

FAX NO.: (213) 576-6660

TEL. NO.: (213) 576-6654

DATE: December 3, 1999

FROM: Alex N. Helperin

MESSAGE: The attached pages, from Chapter 3 of the County's Development Planning Volume, explain the scope of projects to which the .75 inch capture volume standard applies. Give me a call if you have any questions.

The information contained in this facsimile message is legally privileged and confidential information intended only for the use of the addressee named above. If the reader of this message is not the intended recipient, you are hereby notified that any dissemination, distribution, or copy of this telecopy is strictly prohibited. If you have received this telecopy in error, please immediately notify us by telephone number listed above and return the original message to us at the address above via the United States Postal Service. We will reimburse any costs you incur in notifying us and returning the message to us. Thank you.

R0070944

SECTION THREE LOS ANGELES COUNTY REQUIREMENTS

3.1 CATEGORIZATION OF DEVELOPMENT PROJECTS

Beginning June 1999, the DPW divisions that have responsibility for review of development project plans will categorize proposed projects as "Planning Stormwater Priority Projects" or "Planning Stormwater Exempt Projects" with respect to the potential for a significant effect on stormwater quality. Planning Stormwater Priority Projects shall be required to incorporate appropriate post-construction BMPs into project plans prior to the issuance of any building or grading permit.

In order to categorize a project as a Planning Stormwater Priority Project or a Planning Stormwater Exempt Project, project type, characteristics, and activities will be assessed for potential contribution to stormwater pollution. The DPW Building and Safety/Land Development Division shall conduct a screen check for projects utilizing a standardized checklist ("Priority/Exempt Checklist") that lists project type and project characteristics and activities that are believed to be significant potential contributors to stormwater pollution. The Priority/Exempt checklist that shall be used for categorizing projects as a Planning Stormwater Priority Project or a Planning Stormwater Exempt Project is shown in Figure 3-1 and included in Appendix A.

In utilizing the Priority/Exempt Checklist, a commercial or industrial development of 100,000 or more square feet shall be based on total impermeable area as opposed to lot size or building footprint. This interpretation shall be used because of the intent to manage storm water runoff from paved areas associated with buildings. A restaurant is a facility that would use the Standard Industrial Classification (SIC) code of 5812 and an automotive repair shop is a facility that would use one of the following SIC codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Hillside development shall be defined as development having any of the following characteristics:

- location in an area known to have erosive soil conditions as identified in the *Los Angeles County Department of Public Works Hydrology/Sedimentation Manual*;
- grading on any natural slope where the natural slope is 25% or greater; or
- plans include cut or fill slopes that are 30 feet high or greater.

Since the County's Department of Regional Planning also has a fundamental role in approval of development projects, a process has been developed to incorporate the screen check for

categorizing projects as a Planning Stormwater Priority Project or a Planning Stormwater Exempt Project early in the planning stages of "discretionary"[1] projects. A flowchart depicting this process is provided as Figure 3-2.

[1] Section 15357 of the California Environmental Quality Act Guidelines defines "discretionary project" as a project which requires the exercise of judgment or deliberation when the public agency or body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

FIGURE 3-1. CHECKLIST FOR CATEGORIZING PROJECTS AS PLANNING STORMWATER PRIORITY OR PLANNING STORMWATER EXEMPT

Project Name: _____

Project Location: _____

The project is a Planning Stormwater Priority Project if any of the project types listed in Part A or any of the project characteristics or activities listed in Part B are applicable.

Part A. Type of Proposed Project:	Check If Applicable
A 100+ home subdivision	
A 10-99 home subdivision	
A 100,000+ square-foot commercial or industrial development	
An automotive repair shop (SIC codes 5013, 5014, 5541, 7532-7534, and 7536-7539)	
A retail gasoline outlet	
A restaurant (SIC code 5812)	
A hillside-located single-family dwelling	

Part B. Project Characteristics or Activities:	Check If Applicable
Automotive or equipment repair and/or maintenance	
Car wash	
Automotive or equipment washing or cleaning area(s)	
Gas station or fuel dispensing	
Parking lot with 25 or more parking spaces	
Outdoor material or waste handling or storage	
Chemical handling and/or storage of petroleum products, paints, solvents, concrete, or hazardous waste	
Outdoor equipment or product fabrication including welding; cutting; sawing; metal fabrication; assembly; application of paints, coatings, or finishes; pre-cast concrete fabrication; etc.	
Outdoor areas for equipment or machinery repair and/or maintenance	
Dry cleaning factory	
Food service	
Food processing plant	
Hospitals, laboratories, or other medical facilities	
Nursery (plant materials)	
Animal slaughtering	
Animal containment, pet care facilities, stables, kennels, etc.	
Public recreation uses such as tennis courts, swimming pools, golf courses	
10 or more dwelling units	
Hillside location	
Landscaped areas > 5 acres, including cemeteries, golf courses, etc.	
Location adjoining to, bisected by, or discharging to a designated environmentally sensitive area[2], riparian corridor, or wetland	

R0070947

[2] "Environmentally sensitive areas" may be, but not limited to, wetlands, habitats of endangered, threatened, or rare species, wildlife dispersal or migration corridors, areas of locally-designated species such as heritage trees, or locally-designated natural communities such as oak forest or coastal habitat.

To: Dennis Dickerson
From: Marilyn Lyon (213) 576-6640

RESOLUTION NO._____

A RESOLUTION OF THE CITY OF RANCHO PALOS VERDES URGING THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, NOT TO REQUIRE CITIES TO IMPOSE NUMERIC LIMITS ON THE TREATMENT OR RETENTION OF STORM WATER RUNOFF FROM NEW DEVELOPMENTS PURSUANT TO THE LOS ANGELES COUNTY MUNICIPAL NPDES PERMIT

Whereas, the California Regional Water Quality Control Board, Los Angeles Region (hereinafter "regional board") is considering the incorporation of numeric limits into the Standard Urban Storm Water Runoff Mitigation Plan component of the model development planning program – a requirement associated with the Los Angeles County Municipal NPDES permit (hereinafter, "municipal NPDES permit");

Whereas, such numeric limits are intended to retain or treat storm water runoff volume (either .60" or .75" of rain) from 7 categories of new development projects, including gas stations, restaurants, auto repair facilities, 10-99 home sub-divisions, 100-plus home sub-divisions, single-family hillside homes, and 100,000 square foot commercial developments;

Whereas, meeting the proposed numeric limits would necessitate the imposition of structural controls on new developments, including but not limited to extended detention basins, wet ponds, infiltration basins/ponds (which reduce the amount developable space), storm drain-connected oil/grit separators, catch basin inserts, grassy swales, and other devices, many of which have not been proven to be cost-effective;

Whereas, such structural controls would require post-construction operation and maintenance, for which cities would be responsible;

Whereas, such controls, if not properly designed or maintained, could become sources of pollution rather than pollution mitigants;

Whereas, storm water treatment and retention numeric limits are not mandated in the municipal NPDES permit and are not required of other municipal NPDES permits in the State of California;

Whereas, neither the regional board nor any other interested party has provided compelling justification for the use of numeric limits for treating or retaining storm water runoff from new developments;

Whereas, neither the regional board nor any other interested party has demonstrated that storm water retention/treatment numeric limits would result in the improvement or protection of a beneficial use of a receiving water;

Whereas, imposing such unproven and questionable numeric limits on cities constitutes an unfunded state mandate, one that has not been evaluated in cost-effective terms, as required by state law;

NOW, THEREFORE, the City of Rancho Palos Verdes does hereby resolve as follows:

Section 1. Advise regional board members of its opposition to storm water treatment/retention numeric limits; and

Section 2. Recommend that the regional board approve the Standard Urban Storm Water Mitigation Plan, which does not include numeric limits, as proposed by the Executive Advisory Committee on August 11, 1999.

The City of Long Beach

TOM RICHMAN & ASSOCIATES

RECEIVED
99 SEP 13 PM 1:30
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

09 September 1999

Dennis Dickerson, Executive Officer
Regional Water Quality Control Board
320 West Fourth Street, Suite 200
Los Angeles, CA 90013

Re: *Start at the Source* Workshop

Dear Dennis,

I am writing to follow-up on a phone conversation we had several weeks ago about our facilitating a workshop on post-construction stormwater controls in Los Angeles. I have taken some time to send you the information I promised because I was waiting to complete our Final Report on the workshops that we have recently completed in the San Francisco Bay Area for the Bay Area Stormwater Agencies Association (BASMAA).

The workshop that we propose to facilitate in Los Angeles would follow a similar format of interactive exercies and presenations. These were held at several locations in the San Francisco Bay Area to support *Start at the Source: Design Guidance Manual for Stormwater Quality Protection.* To provide more information about these workshops, I am enclosing a copy of the Manual and our "Final Report- 1999 Outreach Program." This Final Report details the workshop agenda, the exercises, and the participant response. Though the Manual was written for the S.F. Bay Area, its principles and concepts are applicable to southern California. However, we can tailor the exercises and presentation to focus on specific local issues of interest.

Our fee for the workshop is Six thousand dollars ($6,000), plus travel expenses. This fee includes the following services and materials:

- In consultation with you, modify workshop as necessary to adjust to local issues.
- Provide a workshop flyer (if requested). One copy camera ready art.
- Provide materials required for workshop interactive exercises (excluding AV equipment).
- Provide at least one staff member to every twelve participants (1:12 ratio, with 100 participants, maximum).
- Facilitate workshop.

Urban Design and Landscape Architecture

654 Gilman Street • Palo Alto, CA 94301
Voice **650.462.8880** • Fax 650.325.1018
www.tomrichman.com

R0070950

We anticipate travel expenses would be needed for three of our employees who would come from northern California. As the workshop starts early in the morning, these expenses would include airfare and one night's lodging. As we have done in the past, we would draw additional facilitators from graduate students at local landscape architecture and planning programs.

The following items are not included in our services and would be provided by you or some other host organization.

- Develop attendee or mailing list
- Duplicate or mail flyers
- Manage registration and sign-in
- Provide meeting room
- Provide morning refreshments and lunch
- Provide one copy of *Start at the Source* for each participant.

The retail price of *Start at the Source* is $43 including shipping, available from Forbes Custom Publishing (toll free 877 773.7247). I understand that BASMAA is considering providing copies of the Manual to other stormwater programs at a significant discount. Please contact BASMAA's Executive Director, Geoff Brosseau (510 622.2300) for more information about obtaining the Manuals at a discount. Geoff can also give you his impression of the workshop and its effectiveness.

As you will see in the Final Report, the workshops and Manual have been enthusiastically received, and we are eager to bring them to Southern California. We already have experience with some of your issues, as we have held sessions in Santa Monica and participated in a design charette at Los Angeles in 1997 sponsored by T.R.E.E.S. and various municipal organizations.

Please call me if you have questions about any aspect of the workshop. Thanks again for your interest. We look forward to bringing the workshop to your region.

Sincerely,

Tom Richman, ASLA, AICP
Registered California Landscape Architect 2741

LOS ANGELES COUNTY MUNICIPAL
STORM WATER AND URBAN RUNOFF PERMIT
STATUS AND TRACKING

PERMIT REQUIREMENTS/ MODEL PROGRAMS (PERMIT SECTION)	PERMIT DUE DATE	REQUIRED ACTION DATE (Staff/Board)	ACTUAL ACTION DATE(S)	COMMENTS
1. Budget Summary Format (I.D.1)	10-30-96	2-27-97 (Staff)	2-10-97 6-13-97	Letter - Format determined not acceptable. Revised format submitted 4-28-97. Letter - Format established.
2. Demonstrate Legal Authority (I.E.2)	11-28-96	3-27-97 (Staff)	7-5-98	Letters requesting a revised legal authority certification were mailed out with response due back from municipalities by August 31. Sixty-six municipalities responded with certification by deadline.
3. Illicit Connections/ Discharges (IC/ID) Model Program (II.A.1) - Public Reporting of IC/ID - Hazardous Substance Reporting	3-31- 97	7-30-97 (Staff) Follow-up comments- 12-5-97 (Staff)	7-30-97 12-5-97 1-12-98 2-26-98 05-04-98 12-02-98 12-17-98 12-30-98 01-11-99 03-23-99	Letter - Disapproval. Staff met with Storm water subcommittee on 9-9-97. Letter - Provided staff comments and identified deficiencies. Time schedule to revise submittal in line with staff comments submitted 12-28-97. Met with sub-committee Letter sent to better clarify illicit connections survey. Revised model program submitted. EPA consultant draft review completed and recommendations received. Revised ICID model program sent to LACDPW for comment EPA consultant final review completed and recommendations forwarded Met with ICID sub-committee to finalize revisions based on EPA consultant recommendations Final ICID approval by EO.
4. Street Wash Study (II.C)	7-15-97	(Board)	01-20-98 04-13-98	Discussed with Storm Water Work Group. Board approval.
5. Public Information and Participation (V)				
a. Outreach Materials -written (V.A.1)	3-31-97	None		Date and action specified in permit.
b. Outreach Materials -distribute (V.A.2)	7-30-97	None		Date and action specified in permit.
c. Develop database format (V.B.1)	7-30-97			Date and action specified in permit
d. Compile industrial / commercial database (V.B.1)	7-01-98	Consultation	07-30-98	Consultation completed. First quarterly electronic update of sites visited submitted 10-21-98. Second quarterly update submitted 1-14-99. Third update submitted on 4-15-99. Fourth update submitted on 7-14-96. Next Update scheduled for 10-15.
e. Industrial/ Commercial BMPs Checklist (V.B.2)	5-30-97	(Board)	11-14-97 (Staff) 1-30-98	Letter - Staff approval with caveats. Staff worked with LA County on acceptable submittal. BMPs resubmitted. Board approval.
f. Educational Site-Visits (V.B.3)	7-30-01	None	04-13-98	
g. Five -Year Public Education Strategy (V.C.1)	7-30-97	12-1-97 (Staff)	12-1-97	Action and frequency specified in permit. No separate action needed. Letter - Staff approval.

R0070952

PERMIT REQUIREMENTS/ MODEL PROGRAMS (PERMIT SECTION)	PERMIT DUE DATE	REQUIRED ACTION DATE (Staff/Board)	ACTUAL ACTION DATE(S)	COMMENTS
6. Annual Reporting Format (VII.A.1)	1-31-97	5-31-97 (Staff)	5-30-97	Letter - Disapproval.
			8-11-97	Revised format submitted .
			8-28-97	Letter - Staff approved.
a. 1998-1999 Outline Prepared	None		12-30-98	EPA consultant review draft received.
b. 1998- 1999 Revised Form	None		00-4-99	EO approved short format.
7. Development Construction Model Program (III.B.1) - Guidance Materials - Inspection	9-30-97	1-28-98 (Staff)	10-18-98	Submittal discussed with Storm Water Work Group 10-18-97. Letter - Staff preliminary comments by 1-28-98.
			1-28-98	Met with Principal Permittee to present comments.
		(BMPs-Board)	02-09-98	Letter - Conditional approval with requirement to resubmit by 6-15-98.
			12-01-98	Final comments provided .
			04-10-98	Final draft development construction model sent to interested parties for comment.
			02-11-99	Final Development Construction approved by EO.
			04-22-98	Development Construction BMPs approved by Board.
a. Procedure to deny grading permits if no NOI or SWPPP (III.B.2)	1-31-97	None		Action and date specified in permit.
8. Public Agency Activities Model Program (IV.A)	12-1-97	3-31-98 (Staff)	11-18-97	Draft submittal discussed with the Storm Water Advisory Group .
			12-1-97	Final program submitted.
			04-10-98	Letter-Conditional approval with requirement to resubmit by 6-15-98.
			07-07-98.	Given final approval with specific changes. Final document due 10-21-98.
			10-21-98	Final Public Agency accepted by EO.
9. Development Planning Model Program (III.A.1.) - Guidance Materials - BMPs - CEQA Review Guidelines - Developers Information	1-30-98	5-30-98 (Staff)	11-04-97	Draft submittal discussed with the Storm Water Work Group.
		(BMPs-Board)	04-10-98	Letter - Disapproval with comments; requirement to provide schedule for resubmittal by 04-25-98.
			08-19-98	Revised model submitted.
			12-23-98	Final draft development planning model sent to interested parties for comment.
			02-11-99	Final Planning Model approved by EO.
			04-22-99	Development Construction BMPs approved by Board.

R0070953

PERMIT REQUIREMENTS/ MODEL PROGRAMS (PERMIT SECTION)	DUE DATE	REQUIRED ACTION DATE (Staff/Board)	ACTUAL ACTION DATE(S)	COMMENTS
10. Annual Monitoring Report	7-15-97 (annual)	None required	07-15-97	Report for 96/97 submitted.
	7-15-98	Requested changes need approval	07-15-98	Report for 97/98 submitted. Also submitted proposed monitoring changes for 98/99 which need staff consultation. LA County workshop on 10-7-98. Staff action by 12-15-98
			12-15-98	Part changes approved and revisions authorized for 1998/99 monitoring
			1-11-99	Met with LACDPW to review and clarify revisions to monitoring program.
	7-15-99	None required	10-15-99	Scheduled to review and comment.
11. Annual Program Report, 1996/97 (VII.A.2)	10-15-97	None required	10-15-97	Report for 96/97 submitted.
			04-01-98	Staff reviewed and prepared comments for all permittees.
1997/1998	10-15-98	None required	10-15-98	Report for 97/98 submitted. Not reviewed.
1998/1999	10-15-99	None required	10-15-99	
12. MS4 Permit Fees BCP a. Prepare BCP for directing MS4 permit fees		None required	04-01-99	Completed.
13. LBSWMP a. Consider City of Long Beach SWMP		None required	03-23-99	Received LBSWMP.
			05-27-99	LBSWMP approved by EO
14. SUSMPs and Numerical Mitigation Standard for Development Planning	07-30-99	Staff (Board request to consider)	08-10-99	Public Workshop to discuss issue.
			08-16-99	Public Notice of Board Hearing to Discuss SUSMP approval
			09-16-99	Board Hearing to discuss staff recommendation
			01-06-00	Board Hearing to consider numerical mitigation measure for SUSMPs.
15. City of Long Beach ROWD a. Process ROWD for City of Long Beach	03-23-99		03-23-99	Received ROWD.
		04-23-99	04-23-99	Communicated status of completeness of application by phone.
16. City of Long Beach MS4 permit		None required	04-09-99	Prepared Draft No.1 for discussion and comment.
a. Prepare MS4 permit for City of Long Beach.			04-19-99	Received comments.
			05-99	Prepared interim drafts 2-6 for discussion and comment
			05-28-99	Mailed tentative permit.
b. Complete Settlement Agreement	04-28-99		05-28-99	Settlement Agreement signed by the principals and attorneys for the two parties.
c. Schedule for Board Resolution	06-30-99		06-30-99	Resolution adopted by Board.
d. Schedule for Board Consideration.	06-30-99		06-30-99	Permit adopted by Board.

R0070954

The Regional Water Quality Control Board has invited Camp Dresser & McKee to present a discussion of the hydrology of water quality. Camp Dresser & McKee is widely recognized for its expertise in environmental engineering, and has extensive experience in California and the U.S. working with public agencies to develop implementable storm water quality control programs.

Dr. Brahsear has more than 12 years of experience in environmental and water resources engineering, including storm water quantity and quality management, watershed management, water and wastewater treatment, modeling of water quantity and quality, and management of wet weather impacts to collection systems. Dr. Brashear is experienced with a range of surface water quantity and quality models, including MIKE BASIN, TAMUWRAP, SWMM4, WMM, WASP, MOUSE, HYDROWORKS, and STORM.

Dr. Brashear holds a Bachelor's Degree in Civil Engineering, a Master's Degree in Environmental Engineering, and a Doctorate in Environmental Engineering from Texas Tech University. He is currently CDM's water resources practice leader in the southwest.

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Phone #	Phone #	
Fax #	Fax #	

Los Angeles County NPDES Stormwate
Executive Advisory Committee
December 8, 1999

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1	Abbaszadeh, Nasser	Azusa		nabbaszadeh@azusa.ca.gov
2	Alvarez, Desi	Downey		dalvarez@downeyca.org
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5	Collins, Rose*	Long Beach		rocolli@ci.long-beach.ca.us
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7	Hunter, John	South Gate		skennedy@jlha.net
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14	Rietzel, Amelia*	Santa Clarita		arietzel@santa-clarita.com
15	Rubin, Fred	Los Angeles County		frubin@dpw.co.la.ca.us

12-08-1999 3:46PM FROM LACDPW-WATER QUALITY 626 458 3534

R0070957

	Name	City/Agency	Signature	E-mail Address
16	Schroder, Edward	Signal Hill	Ed Schroder	
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19	Tahir, Ray*	Whittier		tecsenv@yahoo.com
20	Taylor, Jim*	Westlake Village		jtaylor@willdan.com
21	Dickerson, Dennis	Regional Board		ddickers@rb4.swrcb.ca.gov
22	Xavier Swamikannu	Regional Board		xswami@rb4.swrcb.gov
23	Carmen Rios	Los Angeles County	Carmen Rios	crios@dpw.co.la.ca.us
24		Los Angeles County		
25	Aven Yam	City of Manhattan Beach	Aven Yam	ayam@ci.manhattan-beach.ca.us
26	Tim Piasky	Los Angeles County	Tim Piasky	tpiasky@dpw.co.la.ca.us
27	Eileen Ansari Mayor Pro Tem	Diamond Bar City Council Mayor Pro Tem	Eileen Ansari	eileen.ansari@ci.diamond-bar.ca.us
28	Margaret Clark	Rosemead	Margaret Clark	
	*Alternate Don Wolfe	DPW	Don Wolfe	dwolfe

12-28-1999 3:48PM FROM LACDPW-WATER QUALITY 626 458 3534 P.02

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and

- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will be need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds 50% of the market value of the existing improvements, existing and new improvements shall comply with this SUSMP. When the cost of new improvements are less than 50% of the market value of the existing improvements, only the new improvements need to comply with this SUSMP.

REQUIREMENTS

1. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

2. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of that BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited to that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question.

However, it is possible that a combination of BMPs not so rated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Complying with all zoning and applicable ordinances, minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Complying with all zoning and applicable ordinances, reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Complying with all zoning and applicable ordinances, reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas and avoid routing rooftop runoff to the roadway and the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from each and every storm event of up to and including 0.6-inches of rainfall from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be added)
- Extended/dry detention basins (Applicability and design criteria to be added)
- Infiltration basins (Applicability and design criteria to be added)
- Infiltration trenches (Applicability and design criteria to be added)
- Wet ponds (Applicability and design criteria to be added)
- Constructed wetlands (Applicability and design criteria to be added)
- Oil/Water separators (Applicability and design criteria to be added)
- Catch basin inserts (Applicability and design criteria to be added)
- Storm drain inserts (Applicability and design criteria to be added)
- Media filtration (Applicability and design criteria to be added)
- Bioretention facility (Applicability and design criteria to be added)
- Dry-wells (Applicability and design criteria to be added)
- Cisterns (Applicability and design criteria to be added)
- Foundation planting (Applicability and design criteria to be added)

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Safely convey runoff from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Energy dissipaters, such as riprap, must be installed at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.
- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN COMMON[1] OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor common areas for storage or use of materials the following structural BMPs are required:

- Areas where materials are to be used or stored must be protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

6. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

1 Common areas are areas which are designed and intended for active or passive use, or are for the purpose of providing access or services to the owners (or their designees). Examples of common areas are: parking areas, driveways, service areas, recreational amenities such as swimming pools, spas, picnic areas and tables, benches, tot lots, play areas, ball courts, barbecue areas, sitting areas, lawn and grass areas, landscape areas, planter areas, slopes, trails, walkways, and trash areas.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring they are responsible for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property. If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD

ADMINISTRATIVE RECORD INDEX

VOLUME Water Quality References

A. STATEWIDE

1. California Industrial/Commercial Storm Water Inspection Program Handbook, March 1996, Alameda County

2. Compilation of New Development Stormwater Treatment Controls in the San Francisco Bay Area Final Report. June 1997. Bay Area Stormwater Management Agencies Association

3. California's Rivers and Streams - Working Toward Solutions(1998?), Cal/EPA & State Water Resources Control Board

4. California Storm Water Best Management Practice Handbooks - Industrial/Commercial. March 1993, California Storm Water Quality Task Force

5. California Storm Water Best Management Practice Handbook - Construction Activity. March 1993, California Storm Water Quality Task Force

6. California Storm Water Best Management Practice Handbook – Municipal Camp. March 1993. California Storm Water Quality Task Force

7. Erosion and Sediment Control Handbook. May 1978, Department of Conservation Resources Agency

8. Non-point Source Management Program, Urban Runoff Technical Advisory Committee Report and Recommendations, November 1994, State Water Resources Control Board

9. Start at the Source: *Design Guidance Manual for Stormwater Quality Protection.* 1999, Bay Area Stormwater Management Agencies Association

10. Water Quality Assessment - 1996, State Water Resources Control Board

B. FEDERAL

11. EPA, Final Report of the Nationwide Urban Runoff Program, December 1993

12. EPA, Guidance Specifying Management Measures for Sources of Non-point Pollution in Coastal Waters, Document No. EPA-840-B-92-002, 1993

Because of the extensive volume of material that comprises this Administrative Record, the Regional Board reserves the right to introduce additional documents that may have been inadvertently left out at this time. 1

13. EPA, National Water Quality Inventory, 1992 Report to Congress, 1992

14. EPA, Selected Urban Storm Water Runoff Abstracts, July 1968 - June 1970

15. EPA, Seminar Publication, National Conference on Urban Runoff Management: Enhancing Urban Watershed Management at the Local, County, and State Levels, March 30 - April 2, 1993

16. Estuaries on the Edge: The Vital Link Between Land and Sea, 1996 American Oceans Campaign

17. Guidance on Stormwater Drainage Wells Draft for Review, Version 2.07. July 1997. EPA Office of Groundwater and Drinking Water

18. Guidance manual for the Preparation of NPDES Permit Applications for Storm Water Discharges Associated with Industrial Activity Document No. USEPA 505/8-91-002, April 1991 USEPA Office of Water (EN-336)

19. Handbook on Urban Runoff Pollution Prevention and Control Planning – Document No. EPA (625/R-93/004), September 1993 USEPA Office of Research and Development Washington DC 20460

20. Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems - A User's Guide Document No. EPA/600/R-92-238, January 1993, EPA Office of Research and Development Washington, DC 20460

21. National Water Quality Inventory - 1994 Report to Congress USEPA 841-R-95-005, December 1995 EPA Office of Water Washington, D.C.

22. Northern Virginia Soil and Water Conservation District, USEPA Department of Water. Developing Successful Runoff Control Programs for Urbanized Areas Final Report. Fairfax, Virginia. July 1, 1994

23. NPDES Storm Water Sampling Guidance, Document No. EPA 833-B-02-001, July 1992 EPA Office of Water (EN - 336)

24. NRDC, Poison Runoff: A Guide to State and Local Control of Non-point Source Water Pollution, April 1989

25. Pollution Program Affiliates, Inc. Water: The Challenge of Cleansing Rivers and Oceans, April 7, 1994

26. The Rensselaerville Institute. The EPA Stormwater Management Program Report, Vol. 1. October 1992

27. Saving Bays and Estuaries: A Handbook of Tactics, Document No. USEPA 503/8-88-001, June 1988 EPA Office of Marine and Estuaries Protection

28. A State and Local Government Guide to Environmental Program Funding Alternatives, Document No. EPA 841-K-94-001, January 1994 EPA Office of Water (4503F)

29. Storm Water Discharges Potentially Addressed by Phase II of the National Pollutant Discharge Elimination System Storm Water Program - Report to Congress, Document No. EPA 833-K-94-002, March 1995 EPA Office of Water (4203)

30. Storm Water Management for Construction Activities - Developing Pollution Prevention Plans and Best Management Practices, Document No. ? USEPA Office of Water (WH-547)

31. Terrene Institute Washington, D.C., Urbanization and Water Quality: A Guide to Protecting the Urban Environment, March 1994

32. Treatment and Disposal of Hazardous Waste, Hazardous and Toxic Wastes Associated with Urban Storm Water Runoff, Document No. EPA 600-9-90-037 Remedial Action, 1990 EPA & Pitt and Field

33. Urban Storm Water Toxic Pollutants: Assessments, Sources, and Treatability, Stormwater NPDES Related Monitoring Needs Torno, Harry C., Editor,1995

34. Urban Stormwater Quality Enhancement - Source Control, Retrofitting, and Combined Sewer Technology, Torno, Harry C., Editor

35. Urban Soil Erosion and Sediment Control Committee, Guidelines for Urban Erosion and Sediment Control, October 1991

36. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Economic Valuation of Natural Resources: A Handbook for Coastal Resource Policymaker, June 1995

37. US Department of Commerce, Methodology for Analysis of Detention Basins for Control of Urban Runoff Quality, National Technical Information Service, September 1986

38. USEPA Office of Water, Coastal Nonpoint Pollution Control Program-Development and Approval Guidance, January 1993

39. USEPA Office of Water, Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters Section 6217(g) of the Coastal Zone Act Reauthorization Amendments of 1990, Washington DC, January 1993

40. USEPA Office of Water. Municipal Wastewater Management Fact Sheets Stormwater Best Management Practices. Washington D.C. September 1996

41. USEPA Region V. National Conference on Urban Erosion and Sediment Control: *Institutions and Technology.* January 1980

42. USEPA, Region 5 (Water Division, Wetlands and Watershed Section, Watershed Management Unit), USEPA Office of Wastewater Enforcement and Compliance

Permit Division NPDES Program and Stormwater Section, Urban Runoff Management Information/Education Products

43. USEPA, Storm Water Management for Industrial Activities - Developing Pollution Prevention Plans and Best Management Practices, Document No. USEPA 832-R-92-006, September 1992

44. Water-Supply Paper 2363: Techniques for Estimation of Storm-Runoff Loads, Volumes, and Selected Constituent Concentrations in Urban Watersheds in the United States. Washington D.C. 1990. United States Geological Survey Driver, Nancy E. & Tasker, Gary D

45. Watershed Management Institute and Terrene Institute in Cooperation with USEPA, Fundamentals of Urban Runoff Management: Technical and Institutional Issues, August 1994

C. LOS ANGELES REGIONAL

46. An Assessment of Inputs of Fecal Indicator Organisms and Human Enteric Viruses from Two Santa Monica Storm Drains - Technical Report, Santa Monica Bay Restoration Project, June 1990

47. An Assessment of Monitoring and Data Management Needs in Santa Monica Bay - Final Report, Submitted to The Santa Monica Bay Restoration Project, Southern Cal. Coastal Water Research Project and EcoAnalysis, Inc., May 13, 1991

48. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. II (Review of Water and Wastewater Sampling Techniques with an Emphasis on Stormwater Monitoring Requirements), Stenstrom Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

49. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. III (Surface Drainage Water Quality Monitoring Program Plan), Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

50. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. IV (Selection of Best Management Practices for Control of Storm Water Pollution to Santa Monica Bay), Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

51. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. I (Annual Pollutant Loadings to Santa Monica Bay from Storm Water Runoff),

Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Strecker Eric W. (Woodward-Clyde Consultants), May 1993

52. Assessment of Storm Drain Sources of Contaminants to Santa Monica Bay - Vol. V (Toxicity of Dry Weather Urban Runoff), Lau, Simlin and Stenstrom, Michael K. Dept. of Civil and Environmental Engineering (UCLA) & Steven Bay from Southern California Coastal Water Research Project, June 14, 1994

53. Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties, Adopted by CRWQCB, LA Region, June 13, 1994

54. Caltrans District 7 - Stormwater Monitoring Summary Report, Tetra Tech, Inc.

55. Chemical Contaminant Releases into Santa Monica Bay (Executive Summary Based on a Pilot Study), Environmental Health Sciences UCLA, School of Public Health, American Oceans Campaign, June 1993

56. Chemical Contaminant Release into The Santa Monica Bay: A Pilot Study, Environmental Health Sciences UCLA, School of Public Health, Final Report to American Oceans Campaign, June 12, 1993

57. Electronic Data Print Out, BPTC Sites Region 4 LA Harbor

58. An Epidemiological Study of Possible Adverse Health Effects of Swimming in Santa Monica By - Final Report, Santa Monica Bay Restoration Project, May 7, 1996

59. Heal the Bay - 1993 State of the Marina Report, Marina Del Rey, Bower Aimee and Gorke Roger, July 9, 1993

60. Heal the Bay 1993 Third Annual Beach Pollution Report Card, Gorke Roger with technical review by Gold Mark, 1993

61. The Hydraulic/Water Conservation Division Los Angeles County Department of Public Works: Hydrologic Report, 1987-1988

62. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1988-1989

63. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1990-1991

64. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1991-1992

65. The Hydraulic/Water Conservation Division, Los Angeles County Department of Public Works: Hydrologic Report, 1993-1994

66. Illicit Discharge Investigation Approach, Ventura Countywide Stormwater Quality Management Program, February 1995

67. Los Angeles Petition of NRDC for Review of Stormwater/Urban Runoff Discharge Permit (Order No. 90-79), Los Angeles Regional Water Quality Control Board Response, October 19, 1990

68. Los Angeles County 1997-98 Stormwater Monitoring Report. Los Angeles County Department of Public Works, SCCWRP, & Woodward-Clyde Consultants. July 10, 1998

69. Los Angeles County Drainage Area Review - Draft Feasibility Report, US Army Corps of Engineers, Los Angeles District, September 1991

70. Los Angeles County Department of Public Works: Waste Management Division, NPDES Permit No. CA0061654 (Phases II and III) - Proposed Stormwater/Urban Runoff Monitoring Program (Mass Emissions Sites), 1994

71. Marine Studies of San Pedro Bay, California Part 2-H - The Marine Environment of marina Del Rey, Harbors Environmental Projects University of Southern California,

72. Marine Studies of San Pedro Bay, California, Part 20F -The Marine Environment of Marina Del Rey (A Report to the Department of Beaches and Harbors, County of Los Angeles), Jones Burton H.; Oguri, Mikihiko; and Soule, Dorothy F., Harbors Environmental Projects University of Southern California, March 1991

73. The Metropolitan Water District of Southern California - Annual Report, MWD - Fiscal year July 1, 1988 to June 30, 1989, 1989

74. The Metropolitan Water District of Southern California - Annual Report, MWD - Fiscal Year July 1, 1989 to June 30, 1990, 1990

75. National Research Council, Monitoring Southern California's Coastal Water, 1990 October 1991 - June 1992

76. Newport Bay Watershed: Construction Activities/Best Management Practices Plan for Sediment Control, Boyle Engineering Corporation - Water Resources Division, Technical Memorandum - November 1981

77. NPDES Permit No. CA0061654 - Santa Monica Bay Drainage Basin (Proposed Stormwater/Urban Runoff monitoring Program), Los Angeles County Dept. of Public Works: Waste Management Division Water Quality Management Section, August 17, 1993

78. Pie Grant, Brash Industries, Dec. 30, 1995

79. Port of Long Beach - Nonpoint Source Storm Water Program, Presented to the LA Regional Water Quality Control Board, July 19, 1994

80. Potential Groundwater Contamination from Intentional and Nonintentional Stormwater Infiltration: *Cooperative Agreement No. CR819573.* Clark, Shirley, Parmer, Keith & Pitt, Robert, Department of Civil and Environmental Engineering. Cincinnati, Ohio. May 1994

81. Quality and Beneficial Use Investigation of the Los Angeles River: Prospects for Restored Beneficial Uses, Danza, James M. Water Environmental Studies M.S., California State University, Fullerton, June 1994

82. Report of Stormwater Monitoring Winter of 1994-1995, Los Angeles County Public Works, March 1996

83. Review of Monitoring and Response Protocol for the Malibu Creek Watershed, Santa Monica Bay Restoration Project - Report, Trim Heather, November 1994

84. Santa Monica Bay Stormwater Pollutant Reduction Study, Engineering-Science for City of Los Angeles Wastewater Program Management Division, December 1987

85. Santa Monica Bay Restoration Project, Progress Update 1990, 1990

86. The Santa Monica Bay Restoration Project, Ozone Disinfection and Treatment of Urban Storm Drain Dry-Weather Flows: A Pilot Treatment Plant (Demonstration on the Kenter Canyon Storm Drain Systems in Santa Monica), Greene, Gerald E., Associate Civil Engineer, June 1992

87. The Santa Monica Bay Restoration Project, Pathogens and Indicators in Storm Drains Within the Santa Monica Bay Watershed, June 1992

88. Santa Monica Bay Characterization Study, MBC Applied Environmental Sciences, Santa Monica Bay Restoration Project, April 1993

89. Santa Monica Bay Restoration Project, Public Summary of the Santa Monica Bay Restoration Plan, December 1994

90. Santa Monica Bay Restoration Plan- The Coastal Watersheds, Santa Monica Bay Restoration Project, September 1994

91. Santa Monica Bay Stormwater Pollutant Reduction Study: Volume I Study Results and Recommendation, Engineering-Science City of Los Angeles Wastewater Program Management Division, June 1994

92. Santa Monica Bay Stormwater Pollutant Reduction Study: Volume I Study Results and Recommendation, Engineering-Science City of Los Angeles Wastewater Program Management Division, June 1994

93. Santa Monica Bay Area Municipal Storm Water/Urban Runoff Pilot Project-Evaluation of Potential Catch Basin Retrofits. San Diego, CA, Psomas & Associates, UCLA, & Woodward-Clyde for Santa Monica Cities Consortium September 1998

94. State Coastal Conservancy, Los Angeles River - Park and Recreation Area Study, December 1993

95. Storm Drains as a Source of Surf Zone Indicators and Human Viruses to Santa Monica Bay. August 1991

96. Storm Runoff in Los Angeles and Ventura Counties, Final Report- Los Angeles California Regional Water Quality Control Board, Los Angeles, California Regional Water Quality Control Board, 1988

97. Southern California Coastal Water Research Project - Annual Report, 1987

98. Southern California Coastal Water Research Project - Annual Report, 1987

99. Southern California Coastal Water Research Project (SCCWRP), Annual Report 1990-1991 and 1991-1992, November 1992

100. Ten-Year Data Summary 1977-1987, California State Mussel Watch, May 1988

101. Toxic Substances Monitoring Program, Ten Year Data Summary 1978-1987, August 1990

102. Toxicity of Stormwater Runoff in Los Angeles County - Annual Report, Southern California Coastal Water Research Project, 1988-1989

103. UC Davis Final Report Site Specific Study for Effluent Dominated Streams (San Gabriel River, Santa Clara River, Calleguas Creek), April 18, 1994

104. UCLA Storm Water Pollution Control Transportation Industries Outreach and Education, June 8, 1995

105. USDA - Natural Resources Conservation Service, Malibu Creek Watershed Natural Resources Plan (Draft), March 1995

106. Ventura Countywide Stormwater Quality Management Program Annual Report, Sheydayi, Alex, Chair of Management Committee, September 1995

107. Waterbodies, Wetlands, and their Beneficial Uses in the Los Angeles Region (4) - A Report Presented to LA Regional Water Quality Control Board - Volume 1, Hanes, Ted L.; Lloyd, William J.; Saint, Prem K., California State University, Fullerton, July 1993

108. Waterbodies, Wetlands, and their Beneficial Uses in the Los Angeles Region (4) - A Report Presented to LA Regional Water Quality Control Board - Volume 2, Hanes, Ted L.; Lloyd, William J.; Saint, Prem K., California State University, Fullerton, July 1993

D. WATER PROGRAM GUIDANCE FROM OTHER AREAS

109. 1994 Puget Sound Water Quality Management Plan, Puget Sound Water Quality Authority, May 18, 1994

110. 1997 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, 1997

111. 1998 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, Portland, 1998

112. 1999 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, 1999

113. Action Plan Demonstration Project: Demonstration of Gasoline Fueling Station Best Management Practices, Final Report, Submitted to U.S. Environmental Protection Agency, Region IX, October 1994

114. Actions Speak Louder than Legislation - Positive Experiences Provide Direction for Urban Runoff Management, Water Environment and Technology, January 1996

115. Advances in Modeling the Management of Stormwater Impacts, Guelph, Ontario, 1996

116. Analysis of Urban BMP Performance and Longevity - Final Report Dept. of Environmental Programs, Metropolitan Washington, Council of Govt., August 1992

117. Better Site Design: A handbook for Changing Development Rules in Your Community for the Site Planning Roundtable, Center for Watershed Protection Ellicott City, Maryland, August 1998

118. Blueprint for a Clean Bay - Best Management Practices to Prevent Stormwater Pollution from Construction Related Activities, Bay Area Stormwater Management Agencies Association, 1995

119. Best Management Practices for Storm Water and Industrial Sanitary Sewer Pollution Control: Non-Point Source Pollution Control Program, Santa Clara County

120. Caltrans, Storm Water Runoff Management Literature Review, March 1996

121. Center for Watershed Protection Silver Springs, Maryland. Site Planning for Urban Stream Protection, Schueler, Tom, December 1995

122. City and County of San Francisco Department of Public Works: Best Management Practices Study, August 1992

123. The Clock is Ticking to Comply with New Stormwater Regulations, Forrest, Carol L. and Oakley, Monica M., March 1991

124. A Consortium of Local Agencies Best Management Practices for Industrial Storm Water Pollution Control, Alameda County Urban Runoff Clean Water Program

125. Compost Stormwater Filter Evaluation, Everett, WA., Leif, William T. P.E. Snohomish County Department of Public Works, January 1999

126. Comprehensive Watersheds Ordinance for City of Austin, TX, 1986

127. Controlling Toxic Pollution in Urban Storm Water Runoff - Options for Local Government, August 1988

128. A Current Assessment of Urban Best Management Practices - Techniques for Reducing Nonpoint Source Pollution in the Coastal Zone, Anacostia Restoration Team Department of Environmental Programs Metropolitan Washington Council of Governments, March 1992

129. Developing Successful Runoff Control Programs for Urbanized Areas, Fairfax Virginia, North Virginia Soil District, July 1, 1994

130. Design for Change- Vision, Value, Community, 1996 Annual Meeting Proceedings, Washington DC, American Society of Landscape Architects, 1996

131. Design of Stormwater Filtering Systems for Chesapeake Research Consortium, Clayton, Richard A. & Schueler. Thomas R., Center for Watershed Protection Silver Spring MD, December 1996

132. Design of Urban Runoff Quality Controls, New York, New York, Roesner, Larry A., Sonnen, Michael B., & Urbonas Ben. 1989

135. The Economics of Stormwater BMP's in the Mid-Atlantic Region. Brown, Whitney & Shcueler, Thomas. Center for Watershed Protection Silver Springs, Maryland. August 1997

136. Good Practices to Protect Our Creeks and Bay - Guidelines for Restaurants, Grocery Stores, Cafeterias, Bakeries, and Delicatessens, Santa Clara Valley Nonpoint Source

137. Impervious Surface Reduction Study - Final Report - Water Resources Program, City of Olympia Dept. of Public Works, May 1995

138. Impervious Surface Reduction Study - Executive Summary- Water Resources Program, City of Olympia Dept. of Public Works, January 1996

139. The Importance of Imperviousness, Watershed Protection Techniques, Vol. 1, Number 3, Fall 1994

140. Industrial Stormwater Pollution Control Compliance - A Comprehensive Source Book for Federal, State, and Regional Regulatory Requirements and Information Resources, Santa Clara Valley Nonpoint Source Pollution Control Program, December 1992

141. Modern Methods for Modeling the Management of Stormwater Impacts, Guelph, Ontario, 1995

142. Municipal Storm Water Management, Ann Arbor, Debo, N. Thomas & Reese, J. Andrew. 1995

143. National Stormwater Best Management Practices Database Version 1.0, American Society of Civil Engineering, June 1996

144. The New Federal Stormwater Regulations, Public Works (City, County and State), February 1991

145. North Natomas Drainage Design and Procedures Manual, City of Sacramento Department of Utilities, July 1998

146. Opportunities in Sustainable Development: Strategies for the Chesapeake Basin, Hill, Margaret, American Society of Landscape Architects, March 1997

147. Orange County - NPDES Stormwater Permit Program Proposed Monitoring Program Orange County Flood Control District, The County of Orange and Its Twenty - Nine Incorporated Cities, February 20, 1991

148. Orange County NPDES Stormwater Program: Drainage Area Management Plan, Submitted to the San Diego and Santa Ana Regional Water Quality Control Boards, April 1993

149. Performance Measures for the National CSO Control Program, AMSA: Association of Metropolitan Sewerage Agencies, January 1996

150. Rapid Watershed Planning Handbook: A Comprehensive Guide for Managing Urbanizing Watersheds for the USEPA, Office of Wetlands Oceans and Watersheds & Region V, Center for Watershed Protection Ellicott City, Maryland, October 1998

151. Results: A Retail Gasoline Outlet and Commercial Parking Lot Storm Water Runoff Study Project N. S2498, Western States Petroleum Association and American Petroleum Institute, September 26, 1994

152. Riverside County Flood Control and Water Conservation District (NPDES Municipal Stormwater Application for Permit Renewal) Flood Control District, Santa Ana Watershed, County and Cities of Riverside County, January 3, 1995

153. Santa Clara Valley Nonpoint Source Study. Vol. 1: Loads Assessment Report (Final Report), February 22, 1991

154. Santa Clara Valley Non-Point Source Program - Proposed Storm Water Management Plan, Section 9, December 20, 1994

155. Second Nature: Adapting LA's Landscape for Sustainable Living, Lipkis, Andy, Treepeople, 1999

156. Sediment Removal in Catch Basins and Catch Basin Inserts, Everett, WA., Leif, William T. P.E. Snohomish County Department of Public Works, March 1998

157. Stormwater Management: Pond Design Example for Extended Detention Wet Pond, Clayton, Richard A. Jr., P.E., Center for Watershed Protection Ellicott City, Maryland, December 1995

158. Storm Water Best Management Practices for Retail Gasoline Outlets Western States Petroleum Association, Project No. S2498, January 12, 1996

159. Stormwater Discharges: Regulatory Compliance and Best Management Practices, New York, Dennison, Mark S. 1996

160. Stormwater Management Manual for the Puget Sound Basin - The Technical Manual Washington State Department of Ecology, February 1992

161. Stormwater Strategies: Community Responses to Runoff Pollution. Clarke Aponte, George P., Cameron, Diane M., Frank, Andrew G., & Lehner, Peter H. Natural Resources Defense Council, May 1999

162. Summary Report: Vehicle Service Facility Waste Minimization Program, 1993

163. Training Seminar, Storm Water Compliance: Municipal Techniques and Strategies, American Public Works Association California Chapter, December 10, 1993

164. Thermal Impacts Associated with Urbanization and Stormwater Management, Best management Practices: Appendices, Dubose, Robert & Galli, John, Department of Environmental Programs, Metropolitan Washington Council of Governments, December 1990

165. Thermal Impacts Associated with Urbanization and Stormwater Management, Best management Practices: Final Report, Galli, John Department of Environmental Programs, Metropolitan Washington Council of Governments, December 1990

166. Urban Drainage and Flood Control District. Urban Storm Drainage Criteria Manual Vol. 3: Best Management Practices. Denver, Colorado. September 1, 1999

167. Urban Hydrology: *A Multidisciplinary Perspective*. Lancaster, Pennsylvania. Lazaro, Timothy R., 1990

168. Urban Runoff Quality Management: *WEF Manual of Practice No. 23 & ASCE Manual and Report on Engineering Practice No. 87.* Alexandria, Virginia, American Society of Civil Engineers, 1998

169. Urban Storm Drainage - Criteria Manual Vol. 3 (Best Management Practices), Urban Drainage and Flood Control District, Denver, Colorado, September 1992

170. Urban Stormwater: An Overview for Municipalities, Public Works, December 1990

171. Water Quality Best Management Practices Manual - For Commercial and Industrial Businesses, Resource Planning Associates, June 30, 1989

172. Water Quality Protection for Automotive Businesses - 1st Edition Business Partners for Clean Water, November 1990

173. Western States Petroleum Association, Service Station Storm Water Runoff Study Contract No. DT 308-02, October 5, 1993

E. APPLICABLE LAWS AND POLICIES

174. Attorney's General's Statement for the State National Pollutant Discharge Elimination System Program and State Pretreatment Program, State of California Office of the Attorney General, May 1987

175. Code of Federal Regulations Part 122 July 1, 1992

176. Comparison of Los Angeles County Draft Storm Water Permit with Similar Permits in Orange and Santa Clara Counties, March 25, 1996

177. Comparative Cost of the LA County Storm Water Management Program, CRWQCB Los Angeles Region, July 9, 1996

178. Draft Interim Permitting Approach For Water Quality-Based Effluent Limitations In Storm Water Permits, June 10, 1996

179. Economic Benefits of Runoff Controls, EPA, September 1995

180. Environmental Impacts of Stormwater Discharges: A National Profile, EPA, June 1992

181. EPA - Interpretative Policy Memorandum on Re-application Requirements for Municipal Separate Storm Water Sewer Systems, May 17, 1996

182. EPA National Water Quality Inventory, 1994 Report to Congress - Executive Summary, 1994

183. Federal Register Environmental Protection Agency 40 CFR Parts 122, 123, 124, and 504 National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges; Proposed Rule, December 7, 1988

184. Federal Register Environmental Protection Agency, 40 CFR Parts 122, 123, and 124 National Pollutant Discharge Elimination System Permit Application Regulations for Storm Water Discharges Final Rule, November 16, 1990

185. Guidance Manual For The Preparation Of Part 2 Of The NPDES Permit Applications For Discharges From Municipal Separate Storm Sewer System, USEPA, November 1992

186. Letter from EPA to Regional Board, November 16, 1989

187. Liquid Assets: A Summertime Perspective on the Importance of Clean Water to the Nation's Economy. USEPA Document No. 800-R-96-002. (see Table of Contents attached), May 1996

188. Memo regarding compliance with Water Quality Standard in NPDES Permits Issued to Municipal Separate Storm Sewers Systems, t, E. Donald, Asst. Adm. & General Counsel, U.S. EPA, January 9, 1991

189. Memo addressed to Archie Matthews (Division of Water Quality) regarding compliance with Coverage of State Highways Under Municipal Storm Water Permits, Jennings, Elizabeth, Senior Staff Counsel, December 2, 1992

190. Memo addressed to William H. Crooks (Executive Officer) regarding compliance with Municipal Storm Water for Stockton, April 23, 1993

191. Memorandum addressed to Storm Water Permit Program Coordinators - Municipal Storm Water Management Plan Components, September 8, 1994

192. Memo addressed to Water Management Division Directors Region I - X regarding compliance with Storm Water Enforcement Strategy, January 12, 1994

193. Memo addressed to Regional Water Board (Executive Officer) regarding compliance with Transmittal of the Final Storm Water Compliance Strategy - California Storm Water Compliance and Enforcement Strategy, March 3, 1994

194. Memo addressed to Urban Runoff Task Force regarding compliance with Non-storm Water Discharges -- Municipal Permits, April 7, 1995

195. Memo Addressed to Bruce Fujimoto (Division Of Water Quality) regarding Municipal Storm Water Permits: Compliance With Water Quality Objectives, Jennings, Elizabeth of SWRCB, October 3, 1995

196. Memo addressed to Catherine Tyrrell, et al. regarding legal issues Raised in Draft Storm Water WDR's/NPDES Permit for LA County, et al., Leon, Jorge SWRCB Senior Staff Counsel, January 10, 1996

197. NPDES Memorandum of Agreement Between the USEPA and CSWRCB

198. NPDES Storm Water Program Question and Answer Document Volume 2, USEPA

199. Results of the Nationwide Urban Runoff Program, Executive Summary, USEPA, December 1983

200. Role of Municipalities in the Implementation of State General NPDES Permits for Storm Water Associated with Industrial Activity to Maryann Jones, SWRCB, USEPA Region 9, Bromley, Eugene, December 1993

201. State Water Resources Control Board - Order No. WQ 91-03, State of California

202. State Water Resources Control Board - Order No. WQ 91-04, State of California

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

CHAPTER 40C-42, F.A.C.

ENVIRONMENTAL RESOURCE PERMITS: REGULATION OF STORMWATER MANAGEMENT SYSTEMS

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CHAPTER 40C-42

ENVIRONMENTAL RESOURCE PERMITS: REGULATION OF STORMWATER MANAGEMENT SYSTEMS

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40C-42.011 Scope.

(1) This chapter governs stormwater management systems which are designed and constructed or implemented to control discharges necessitated by rainfall events. These systems may incorporate methods to collect, convey, store, absorb, inhibit, treat, use or reuse water to prevent or reduce flooding, overdrainage, environmental degradation and pollution, or otherwise affect the quality and quantity of discharges. Standard general and individual environmental resource stormwater permits are required under this chapter for construction, operation, maintenance, alteration, removal, or abandonment of systems that are not permitted under provisions of chapters 40C-4, 40C-40, or 40C-400, F.A.C. Permits issued under this chapter must be consistent with the objectives of the District and not cause harm to the water resource.

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(2) A permit under this chapter will be required only for certain stormwater management systems as defined herein. This provision shall not affect the District's authority to require appropriate corrective action whenever any system causes or contributes to violations of state water quality standards.

(3) Stormwater discharges to groundwaters shall be regulated under the provisions of section 62-28.700, F.A.C., and other applicable rules of the Department of Environmental Protection .

Specific Authority 373.044, 373.113, 373.171, 373.418 FS. Law Implemented 373.416, 403.812, 403.814 FS. History--New 4-1-86. Amended 9-25-91, 10-3-95.

40C-42.021 Definitions.

(1) "Appropriate Registered Professional" or "Registered Professional" means, for purposes of this rule, a professional registered in Florida with the necessary expertise in the fields of hydrology, drainage, flood control, erosion and sediment control, and stormwater pollution control to design and certify stormwater management systems. Examples of registered professionals may include professional engineers licensed under chapter 471, F.S., professional landscape architects licensed under chapter 481, F.S., and professional geologists licensed under chapter 492, F.S., who have the referenced skills.

(2) "As-Built Drawings" means plans certified by an appropriate registered professional or registered surveyor which accurately represents the constructed condition of a system.

(3) "Completion of Construction" means the time at which the stormwater management system is first placed into operation, when the project passes final building inspection or when the project receives a certificate of occupancy, whichever occurs first.

(4) "Construction" means any activity including land clearing, earth moving, or the erection of structures which will result in the creation of a stormwater management system.

(5) "Control Device" or "Bleed-down Device" means that element of a discharge structure which allows the gradual release of water under controlled conditions.

(6) "Control Elevation" means the lowest elevation at which water can be released through the control device.

(7) "Detention with Filtration" or "Filtration" means the selective removal of pollutants from stormwater by the collection and temporary storage of stormwater and the subsequent gradual release of the stormwater into surface waters in the state through at least 2 feet of suitable fine textured granular media such as porous soil, uniformly graded sand, or other natural or artificial fine aggregate, which may be used in conjunction with filter fabric and/or perforated pipe.

(8) "Detention" or "To Detain" means the collection and temporary storage of stormwater with subsequent gradual release of the stormwater.

(9) "Direct Discharge" means, for purposes of this chapter, a point or nonpoint discharge which enters Class I, Class II, or Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting without an adequate opportunity for mixing and dilution to prevent significant degradation. Examples of direct discharge include the following:

(a) discharge without entering any other water body or conveyance prior to release to the Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting;

(b) discharge into an intermittent watercourse which is a tributary of a Class I, Class II, Outstanding Florida Water, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting; and

(c) discharge into a perennial watercourse which is a tributary of a Class I, Class II, Outstanding Florida Water, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting when there is not an adequate opportunity for mixing and dilution to prevent significant degradation.

(10) "Dry detention" means a system designed to collect and temporarily store stormwater in a normally dry basin with subsequent gradual release of the stormwater.

(11) "Effective Grain Size" means the diameter of filter sand or other aggregate that corresponds to the 10 percentile finer by dry weight on the grain size distribution curve.

(12) "Intermittent Watercourse" means a stream or waterway that flows only at certain times of the year, flows in direct response to rainfall, and is normally an influent stream except when the ground water table rises above the normal wet season level.

(13) "Littoral zone" means, in reference to stormwater management systems, that portion of a wet detention pond which is designed to contain rooted aquatic plants.

(14) "Off-line" means the storage of a specified portion of the stormwater in such a manner so that subsequent runoff in excess of the specified volume of stormwater does not flow into the area storing the initial stormwater.

(15) "Operational Maintenance" means any activity or repair required to keep a stormwater management system functioning as permitted and designed.

(16) "Operate" or "Operation" means to cause or to allow a stormwater management system to function.

(17) "Perennial Watercourse" means a stream or waterway which is not an intermittent watercourse.

(18) "Permanent Pool" means that portion of a wet detention pond, which normally holds water (e.g., between the normal water level and the pond bottom) excluding any water volume claimed as wet detention treatment volume pursuant to paragraph 40C-42.026(4)(a), F.A.C.

(19) "Pollution" means the presence in waters of the state of any substances, contaminants, or manmade or man-induced impairment of waters or alteration of the chemical, physical, biological, or radiological integrity of water in quantities or at levels which are or may be potentially harmful or injurious to human health or welfare, animal or plant life, or property or which unreasonably interfere with the enjoyment of life or property, including outdoor recreation unless authorized by applicable law.

(20) "Registered Surveyor" means a registered professional land surveyor licensed in the state of Florida under chapter 472, F.S.

(21) "Reconstruction" means rebuilding or construction in an area upon which construction has previously occurred.

(22) "Retention" means a system designed to prevent the discharge of a given volume of stormwater runoff into surface waters in the state by complete on-site storage. Examples may

include excavated or natural depression storage areas, pervious pavement with subgrade, or above ground storage areas.

(23) "Seasonal high ground water table elevation" means the highest level of the saturated zone in the soil in a year with normal rainfall.

(24) "Semi-impervious" means land surfaces which partially restrict the penetration of water; included as examples are porous concrete and asphalt pavements, limerock, and certain compacted soils.

(25) "Sensitive Karst Areas" means those areas of the District delineated in chapters 40C-4 and 40C-41, F.A.C., in which the Floridan aquifer is near the land surface.

(26) "Stormwater" means the flow of water which results from, and which occurs immediately following, a rainfall event.

(27) "Stormwater Discharge Facility" means a stormwater management system which discharges stormwater into surface waters of the State.

(28) "Stormwater Management System" means a system which is designed and constructed or implemented to control discharges which are necessitated by rainfall events, incorporating methods to collect, convey, store, absorb, inhibit, treat, use or reuse water to prevent or reduce flooding, overdrainage, environmental degradation, and water pollution or otherwise affect the quality and quantity of the discharges.

(29) "Swale" means a manmade trench which:

(a) Has a top width to depth ratio of the cross-section equal to or greater than 6:1, or side slopes equal to or greater than 3 feet horizontal to 1 foot vertical; and,

(b) Contains contiguous areas of standing or flowing water only following a rainfall event; and,

(c) Is planted with or has stabilized vegetation suitable for soil stabilization, stormwater treatment, and nutrient uptake; and,

(d) Is designed to take into account the soil erodibility, soil percolation, slope, slope length, and drainage area so as to prevent erosion and reduce pollutant concentration of any discharge.

(30) "Underdrain" means a drainage system installed beneath a stormwater holding area to improve the infiltration and percolation characteristics of the natural soil when permeability is restricted due to periodic high water table conditions or the presence of layers of fine textured soil below the bottom of the holding area. These systems usually consist of a system of interconnected below-ground conduits such as perforated pipe, which simultaneously limit the water table elevation and intercept, collect, and convey stormwater which has percolated through the soil.

(31) "Underground Exfiltration Trench" or "Exfiltration Trench" means a below-ground system consisting of a conduit such as perforated pipe surrounded by natural or artificial aggregate which is utilized to percolate stormwater into the ground.

(32) "Uniformity Coefficient" means the number representing the degree of homogeneity in the distribution of particle sizes of filter sand or other granular material. The coefficient is calculated by determining the D^{60}/D^{10} ratio where D^{10} and D^{60} refer to the particle diameter corresponding to the 10 and 60 percentile of the material which is finer by dry weight.

(33) "Waters" are as defined in subsection 373.019(8), F.S.

(34) "Wet Detention" means the collection and temporary storage of stormwater in a permanently wet impoundment in such a manner as to provide for treatment through physical, chemical, and biological processes with subsequent gradual release of the stormwater.

(35) "Wetlands Stormwater Management System" means a stormwater management system which incorporates those wetland described in subsection 40C-42.0265(2), F.A.C., into the stormwater management system to provide stormwater treatment.

Specific Authority 373.044, 373.113, 373.171, 373.418 FS. Law Implemented 373.413, 373.416 FS. History--New 4-1-86. Amended 9-25-91, 3-21-93, 4-11-94, 10-3-95

40C-42.022 Permits Required.

(1) A permit is required under this chapter for construction (including operation and maintenance) of a stormwater management system which serves a project that exceeds any of the following thresholds:

(a) Construction of 4,000 square feet or more of impervious or semi-impervious surface area subject to vehicular traffic. This area includes roads, parking lots, driveways, and loading zones;

(b) Construction of 5000 square feet or more of building area or other impervious area not subject to vehicular traffic; or

(c) Construction of 5 acres or more of recreational area. Recreation areas include but are not limited to golf courses, tennis courts, putting greens, driving ranges, or ball fields.

(2) A permit is required under this chapter for alteration, removal, reconstruction, or abandonment of existing stormwater management systems which serve a project which may be expected to result in any of the following:

(a) Increase pollutant loadings (including sediment) in stormwater runoff from the project,

(b) Increase in peak discharge rate,

(c) Decrease in onsite or instream detention storage,

(d) Replacement of roadside swales with curb and gutter,

(e) Construction of 4,000 square feet or more of impervious or semi-impervious surface area subject to vehicular traffic. This area includes roads, parking lots, driveways, and loading zones;

(f) Construction of 5,000 square feet or more of building area or other impervious area not subject to vehicular traffic; or

(g) Construction of 5 acres or more of recreational area. Recreation areas include but not limited to golf courses, tennis courts, putting greens, driving ranges, or ball fields.

(3) These thresholds include all cumulative activity which occurs on or after September 25, 1991.

(4) For purposes of this section, the calculation of the amount of impervious surface shall not include water bodies.

(5) Applications received by the District for which a permit has not been issued prior to the rule revisions effective April 11, 1994, and which do not require a permit pursuant to sections (1) or (2), above, may be withdrawn by the applicant.

(6) Permits issued by the District for systems which no longer require a permit pursuant to sections (1) or (2), above, may either be abandoned or relinquished by the permittee subject to the following:

(a) Local governments may have concurrent jurisdiction with the District over a stormwater system. The permittee is not relieved by this rule of the responsibility to comply with any other applicable rules or ordinances which may govern such system.

(b) The permittee provides reasonable assurance that there will not be a violation of state water quality standards as set forth in chapter 62-302 and 62-550, F.A.C.;

(c) The permittee provides reasonable assurance that adjacent or nearby properties not owned or controlled by the applicant will not be adversely affected by drainage or flooding; and

(d) The permittee must apply to the District for and receive written authorization from the District prior to abandonment of the system.

Specific Authority 373.044, 373.113, 373.171, FS. Law Implemented 373.413, 373.416 FS. History--New 9-15-91. Amended 4-11-94, 11-22-94.

40C-42.0225 Exemptions From Permitting for Stormwater Management Systems. The following types of stormwater management systems are exempt from the notice and permit requirements of this chapter:

(1) Systems designed to accommodate only one single family dwelling unit, duplex, triplex, or quadruplex, provided the single unit, duplex, triplex or quadruplex is not part of a larger common plan of development or sale.

(2) Systems which are designed to serve single family residential projects, including duplexes, triplexes and quadruplexes, of less than 10 acres total land area and which have less than 2 acres impervious surface and if the systems:

(a) Comply with all regulations or ordinances applicable to stormwater management adopted by a city or county;

(b) Are not part of a larger common plan of development or sale; and

(c) Discharge into a stormwater management system exempted or permitted by the District under this chapter which has sufficient capacity and treatment capability as specified in this chapter and is owned, maintained, or operated by a city, county, special district with drainage responsibility, or water management district; however, this exemption does not authorize discharge to a system without the system owner's prior written consent.

(3) Systems that qualify for a noticed general permit pursuant to chapter 40C-400, F.A.C. and which comply with the requirements of such noticed general permit.

Specific Authority 373.044, 373.113, 373.171, 373.413 FS. Law Implemented 373.413, 373.416, 403.812 FS. History--New 9-25-91. Amended 3-21-93, 10-3-95.

40C-42.023 Requirements for Issuance.

(1) To receive a general or individual permit under this chapter the applicant must provide reasonable assurance based on plans, test results and other information, that the stormwater management system:

(a) will not result in discharges from the system to surface and ground water of the state that cause or contribute to violations of state water quality standards as set forth in chapters 62-3,

62-4, 62-302 and 62-550, F.A.C., including any antidegradation provisions of sections 62-4.242(1)(a) and (b), 62-4.242(2) and (3), and 62-302.300, F.A.C., and any special standards for Outstanding Florida Waters and Outstanding National Resource Waters set forth in sections 62-4.242(2) and (3), F.A.C.;

(b) will not adversely affect drainage and flood protection on adjacent or nearby properties not owned or controlled by the applicant;

(c) will be capable of being effectively operated and maintained pursuant to the requirements of this chapter; and

(d) meets any applicable basin criteria contained in chapter 40C-41, F.A.C.

(2)(a) A showing by the applicant that the stormwater management system complies with the applicable criteria in sections 40C-42.024, 40C-42.025, 40C-42.026, and 40C-42.0265, F.A.C., shall create a presumption that the applicant has provided reasonable assurance that the proposed activity meets the requirements in paragraphs (a), above.

(b) A showing by the applicant that the stormwater management system complies with the criteria of subsections 40C-42.025(8) and (9), F.A.C., shall create a presumption that the applicant has provided reasonable assurance that the proposed activity meets the requirements in paragraph (b), above.

(c) A showing by the applicant that the stormwater management system complies with the applicable criteria of sections 40C-42.027, 40C-42.028, and 40C-42.029, F.A.C., shall create a presumption that the applicant has provided reasonable assurance that the proposed activity meets the requirements in paragraph (c), above.

Specific Authority 373.044, 373.113, 373.171, 373.418 FS. Law Implemented 373.413, 373.416 FS. History--New 9-25-91. Amended 3-21-93, 10-3-95.

40C-42.024 Standard General and Individual Permits.

(1) Any person proposing to construct, alter, operate, maintain, remove, or abandon a stormwater management system, which requires a permit pursuant to sections 40C-42.022, F.A.C., except those exempted pursuant to section 40C-42.0225, F.A.C., or noted in section 40C-42.061, F.A.C, shall apply to the District for a standard general or individual environmental resource stormwater permit, prior to the commencement of construction, alteration, removal, operation, maintenance, or abandonment of the stormwater management system. No construction, alteration, removal, operation, maintenance, or abandonment of a stormwater management system shall be undertaken without a valid standard general or individual environmental resource stormwater permit as required pursuant to this section.

(2) The following types of stormwater management systems qualify for a standard general environmental resource stormwater permit and shall be processed according to the administrative procedures set forth in chapter 40C-40, F.A.C.:

(a) Systems which discharge into a stormwater management system which is permitted pursuant to paragraph 40C-42.024(2)(b), (c), or (d), F.A.C., or subsection 40C-42.024(3), F.A.C., or which was previously approved pursuant to a noticed exemption under section 17-25.030 where the appropriate treatment criteria specified in this chapter and applied to the permitted or exempt system are not exceeded by the discharge; however, this does not authorize discharge to the permitted or exempt system without the system owner's prior written consent.

(b) Systems which meet the applicable design and performance standards of section 40C-42.025, F.A.C., and which comply with any one or more of the following:

1. Retention systems which meet the criteria of subsection 40C-42.026(1), F.A.C.;

2. Underdrain systems which meet the criteria of subsection 40C-42.026(2), F.A.C.;

3. Underground exfiltration trench systems which meet the criteria of subsection 40C-42.026(3), F.A.C.;

4. Wet detention systems which meet the criteria of subsection 40C-42.026(4), F.A.C.; or

5. Swale systems which meet the criteria in subsections 40C- 42.021(30) and 40C-42.026(5), F.A.C.

6. Dry detention systems within project areas less than 5 acres in size, and which serve draiage area less than 5 acres in size, and which meet the criteria of subsection 40C-42.026(6), F.A.C.

(c) Modification or reconstruction by a city, county, state agency, federal agency, or special district with drainage responsibility, of an existing stormwater management system which is not intended to increase the original design capacity, and which will not increase pollution loading, or change points of discharge in a manner that would adversely affect the designated uses of waters in the state.

(d) Paving of existing public dirt roads by a public entity if all of the following conditions are met:

1. The road will not serve new development.

2. Additional traffic lanes are not added to the road;

3. The traffic load is not expected to significantly increase;

4. The drainage system serving the road is not significantly altered;

5. Erosion and sediment controls are utilized to prevent turbidity during construction;

6. The project does not involve dredging or filling in wetlands or other surface waters, other than in ditches that were excavated through uplands ;

7. Permanent vegetative cover is established on both sides of the pavement within the road right of way; and

8. Swale blocks, or other means, are utilized to retain runoff and promote infiltration in areas with soil having good infiltration (i.e., SCS hydrologic soil groups "A" and "B").

(3) The following types of stormwater management systems will be processed as an individual permit according to the administrative procedures set forth in chapter 40C-4, F.A.C.:

(a) Wetlands stormwater management systems which are designed pursuant to the criteria in sections 40C-42.025 and 40C-42.0265, F.A.C.;

(b) Systems which propose to satisfy the standards of subsection 40C-42.023(1), F.A.C., by employing an alternative treatment methodology or device other than those described in subsection (2) or paragraph (3)(a), above. An affirmative showing by the applicant that the system design will provide treatment equivalent to retention systems described in paragraph (2)(b)1., above, will create a presumption in favor of satisfying the standards in paragraphs 40C-42.023(1)(a), F.A.C. In addition, systems which have a direct discharge to Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting shall provide an additional level of

treatment (i.e., additional treatment volume and off-line treatment) pursuant to section 40C-42.026, F.A.C., or an alternative demonstrated by the applicant to be equivalent.

(c) Systems which do not meet the applicable criteria of sections 40C-42.025, 40C-42.026, or 40C-42.0265, F.A.C. An affirmative showing by the applicant based on plans, test results, calculations, or other information that an alternative design is appropriate for the specific site conditions will create a presumption in favor of satisfying the applicable standards in subsection 40C-42.023(1), F.A.C.

(4) In otherwise determining whether reasonable assurance has been provided for paragraphs (3)(b) and (c), above, the District shall, where appropriate, consider:

(a) Whether best management practices are proposed, such as those described in "Stormwater Management Manual (October, 1981)," "The Florida Development Manual: A Guide to Sound Land and Water Management (June, 1988)," or best management practices described in manuals adopted by the Environmental Regulation Commission pursuant to section 62-25.050, F.A.C., or other appropriate best management practices (the manuals listed above by name are adopted and made a part of this rule by reference. Copies of these documents may be inspected at all District offices);

(b) The public interest served by the system;

(c) The probable efficacy and costs of alternative controls; and

(d) Whether reasonable provisions have been made for the operation and maintenance of the proposed system.

(5) The standard general or individual environmental resource stormwater permit which is granted will include a specified period for which the permit will be valid. Such period, unless the permit is modified or revoked, is generally:

(a) five years for permits to construct, alter, or remove a system; and

(b) permanent for permits to operate, maintain, or abandon a system.

(6) Procedures governing transfers, permit revocation, permit modifications, and extensions are found in chapters 40C-1 and 40C-4, F.A.C., and apply to permits obtained pursuant to this chapter. Procedures governing converting construction to operation permits and transferring the system to the operation and maintenance entity are found in section 40C-42.027, F.A.C., below. *Specific Authority 373.044, 373.113, 373.118, 373.171, 373.418 FS. Law Implemented 373.413, 373.416, 403.813 FS. History--New 9-25-91. Amended 3-21-93, 4-11-94, 10-3-95.*

40C-42.025 Design and Performance Criteria for Stormwater Management Systems. The following criteria shall apply to stormwater management systems unless otherwise noted:

(1) Erosion and sediment control best management practices shall be used as necessary during construction to retain sediment on-site. These management practices shall be designed and certified by an appropriate registered professional experienced in the fields of soil conservation or sediment control according to specific site conditions and shall be shown or noted on the plans of the stormwater management system. The registered professional shall furnish the contractor with information pertaining to the construction, operation and maintenance of the erosion and sediment control practice. Sediment accumulations in the system from construction activities shall be removed to prevent loss of storage volume.

(2) Stormwater management systems which either receive stormwater from areas with greater than 50 percent impervious surface or are a potential source of oil and grease contamination in concentrations that exceed applicable water quality standards shall include a baffle, skimmer, grease trap or other mechanism suitable for preventing oil and grease from leaving the stormwater management system in concentrations that would cause or contribute to violations of applicable water quality standards in the receiving waters. For purposes of this subsection, the calculation of the amount of impervious surface shall not include water bodies.

(3) Unless applicable local regulations are more restrictive, for purposes of public safety the following requirements apply:

(a) Normally dry basins designed to impound more than two feet of water or permanently wet basins shall be fenced or otherwise restricted from public access, or shall contain side slopes that are no steeper than 4:1 (horizontal:vertical) out to depth of two feet below the control elevation; and,

(b) Control devices that are designed to contain more than a two foot depth of water within the structure under the design storm and have openings greater than one foot minimum dimension shall be restricted from public access.

(4) All stormwater basin side slopes shall be stabilized by either vegetation or other materials to minimize erosion and sedimentation of the basins.

(5) Stormwater management systems must be designed to accommodate maintenance equipment access and to facilitate regular operational maintenance (such as underdrain replacement, unclogging filters, sediment removal, mowing and vegetation control). Operational maintenance and operation easements shall be provided when necessary to facilitate equipment access.

(6) The applicant must obtain sufficient legal authorization as appropriate prior to permit issuance for stormwater management systems which propose to utilize offsite areas to satisfy the requirements in subsection 40C-42.023(1), F.A.C.

(7) Stormwater management systems (except retention and exfiltration trench systems) shall provide gravity or pumped discharge that effectively operates under one of the following tailwater conditions:

(a) Maximum stage in the receiving water resulting from the mean annual 24-hour storm. This storm depth is described in "Rainfall Analysis for Northeast Florida;" St. Johns River Water Management District Technical Publication No. SJ 88-3 (May, 1988). Lower stages may be utilized if the applicant demonstrates that flow from the project will reach the receiving water prior to the time of maximum stage in the receiving water;

(b) Mean annual high tide for tidal areas;

(c) Mean annual seasonal high water elevation. This elevation may be determined by water lines on vegetation or structures, historical data, adventitious roots or other hydrological or biological indicators, design of man-made systems, or estimated by a registered professional using standard hydrological methods based on the site and receiving water characteristics; or

(d) As an alternative, the applicant may propose any applicable criterion established by a local government, state agency, or stormwater utility with jurisdiction over the project.

(8) Stormwater management systems which require a permit pursuant to subsection 40C-42.022(1), F.A.C., and which serve new construction area with greater than 50 percent

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impervious surface (excluding water bodies) must demonstrate that the post-development peak rate of discharge does not exceed the pre-development peak rate of discharge for one of the following:

(a) The mean annual 24-hour storm event. This storm depth is described in "Rainfall Analysis for Northeast Florida;" St. Johns River Water Management District Technical Publication No. SJ 88-3 (May, 1988). The criteria contained in sections 10.3.5 - 10.3.8 of the Management and Storage of Surface Waters Applicant's Handbook, (A.H.), are herein incorporated by reference;

(b) The mean annual 24-hour storm event utilizing the modified rational hydrograph method. This storm depth is described in the publication referenced in paragraph (a), above. This methodology should only be used for systems meeting the following criteria:

1. The drainage area is less than 40 acres;

2. The pre-development time of concentration for the system is less than 60 minutes; and,

3. The post-development time of concentration for the system is less than 30 minutes; or

(c) As an alternative to paragraphs (a) or (b), above, the applicant may propose a storm event, duration, and criteria specified by a local government, state agency, or stormwater utility with jurisdiction over the project.

(9) Stormwater management systems which alter existing conveyance systems must not adversely affect existing surface water conveyance capabilities. It is presumed that a system meets this criteria if one of the following are met:

(a) The existing hydraulic conveyance is maintained;

(b) The applicant demonstrates that changes in flood elevations or velocities will not adversely impact upstream or downstream off-site property;

(c) The applicant demonstrates that the criteria in 10.5.2(b), Applicant's Handbook, are met; or

(d) As an alternative, the applicant may propose to comply with applicable criteria established by a local government, state agency, or stormwater utility with jurisdiction over the project.

(10) The construction plans and supporting calculations must be signed, sealed, and dated by an appropriate registered professional as required by the relevant statutory provisions when the design of the stormwater management system requires the services of an appropriate registered professional.

(11) Stormwater management systems located within Sensitive Karst Areas must meet the requirements of subsection 40C-41.063(6), F.A.C.

Specific Authority 373.044, 373.113, 373.171, 373.418 FS. Law Implemented 373.117, 373.413, 373.416, 403.0877 FS. History--New 4-1-86. Amended 9-25-91, 3-21-93.

40C-42.026 Specific Design and Performance Criteria.

(1) Retention systems shall:

(a) Provide for one of the following:

1. Off-line retention of the first one half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater;

2. On-line retention of an additional one half inch of runoff from the drainage area over that volume specified in subparagraph 1., above;

3. On-line retention that provides for percolation of the runoff from the three year, one-hour storm; or

4. On-line retention of the runoff from one inch of rainfall or 1.25 inches of runoff from the impervious area, whichever is greater, for systems which serve an area with less than 40 percent impervious surface and that contain only U.S. Department of Agriculture Soil Conservation Service (SCS) hydrologic group "A" soils.

(b) Provide retention in accordance with one of the following for those systems which have direct discharge to Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting:

1. At least an additional fifty percent of the applicable treatment volume specified in subparagraph 1., above. Off-line retention must be provided for at least the first one half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, of the total amount of runoff required to be treated;

2. On-line retention of an additional fifty percent of the treatment volume specified in subparagraph 2., above;

3. On-line retention that provides percolation of the runoff from the three-year, one-hour storm; or

4. On-line retention that provides at least an additional 50 percent of the runoff volume specified in subparagraph 40C-42.026(1)(a)4., above, for systems which serve an area with less that 40 percent impervious surface and that contain only U.S. Department of Agriculture Soil Conservation Service (SCS) hydrologic group "A" soils.

(c) Provide the capacity for the appropriate treatment volume of stormwater specified in paragraphs (a) or (b) above, within 72 hours following the storm event assuming average antecedent moisture conditions. The storage volume must be provided by a decrease of stored water caused only by percolation through soil, evaporation or evapotranspiration.

(d) Be stabilized with pervious material or permanent vegetative cover. Permanent vegetative cover must be utilized, except for pervious pavement systems, when U.S. Department of Agriculture Soil Conservation Service (SCS) hydrologic group "A" soils underlie the retention basin.

(2) Underdrain stormwater management systems shall:

(a) Provide for either of the following:

1. Off-line storage of the first one half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater; or

2. On-line storage of an additional one half inch of runoff from the drainage area over that volume specified in subparagraph 1., above.

(b) Provide either of the following for those underdrain systems which have direct discharge to Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, restricted, or conditionally restricted for shellfish harvesting:

1. At least an additional fifty percent of the applicable treatment volume specified in subparagraph 1., above. Off-line storage must be provided for at least the first one half inch of

runoff or 1.25 inches of runoff from the impervious area, whichever is greater, of the total amount of runoff required to be treated; or

2. On-line storage of the runoff from a three-year, one-hour storm or an additional fifty percent of the treatment volume specified in subparagraph 2., above, whichever is greater.

(c) Provide the capacity for the appropriate treatment volume of stormwater specified in paragraphs (a) or (b), above, within 72 hours following a storm event. The storage volume must be provided by a decrease of stored water caused only by percolation through soil with subsequent transport through the underdrain pipes, evaporation or evapotranspiration.

(d) Provide at least two feet of indigenous soil between the bottom of the stormwater holding area and the underdrain pipe(s).

(e) Be designed with a safety factor of at least two unless the applicant affirmatively demonstrates based on plans, test results, calculations or other information that a lower safety factor is appropriate for the specific site conditions. Examples of how to apply this factor include but are not limited to reducing the design percolation rate by half or designing for the required drawdown within 36 hours instead of 72 hours.

(f) Contain areas of standing water only following a rainfall event.

(g) Be stabilized with permanent vegetative cover.

(h) Include, at a minimum, a capped and sealed inspection and cleanout ports which extend to the surface of the ground at the following locations of each drainage pipe:

1. The terminus; and

2. Every 400 feet or every bend of 45 or more degrees, whichever is less.

(i) Utilize filter fabric or other means used to prevent the soil from moving and being washed out through the underdrain pipe.

(3) Underground exfiltration trench systems shall:

(a) Provide for either of the following:

1. Off-line storage of the first one half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater; or

2. On-line storage of an additional one half inch of runoff from the drainage area over that volume specified in subparagraph 1., above.

(b) Provide either of the following for those exfiltration trench systems which have direct discharge to Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, conditionally restricted for shellfish harvesting:

1. At least an additional fifty percent of the applicable treatment volume specified in subparagraph 1., above. Off-line storage must be provided for at least the first one half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, of the total amount of runoff required to be treated; or

2. On-line storage of the runoff from the three-year, one-hour storm or an additional fifty percent of the treatment volume specified in subparagraph 2., above, whichever is greater.

(c) Provide the capacity for the appropriate treatment volume of stormwater specified in paragraphs (a) or (b), above, within 72 hours following a storm event assuming average antecedent moisture conditions. The storage volume must be provided by a decrease of stored water caused only by percolation into the soil.

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(d) Be designed with a safety factor of at least two unless the applicant affirmatively demonstrates based on plans, test results, calculations or other information that a lower safety factor is appropriate for the specific site conditions. Examples of how to apply this factor include but are not limited to reducing the design percolation rate by half or designing for the required drawdown within 36 hours instead of 72 hours.

(e) Be designed with a twelve (12) inch minimum pipe diameter.

(f) Be designed with a three (3) foot minimum trench width.

(g) Be designed so that aggregate in the trench is enclosed in filter fabric.

(h) Provide cleanout and inspection structures which extend to the surface of the ground at the inlet and terminus of each pipe. Inlet structures should include sediment sumps.

(i) Be designed so that the invert elevation of the trench must be at least two feet above the seasonal high ground water table elevation unless the applicant demonstrates based on plans, test results, calculations or other information that a alternative design is appropriate for the specific site conditions.

(j) Be designed so that the system must have the capacity to retain the required treatment volume without considering discharges to ground or surface waters.

(4) Wet detention stormwater management systems shall:

(a) Provide a treatment volume of the greater of the following:

1. First one inch of runoff; or

2. 2.5 inches of runoff from the impervious area.

(b) Be designed so that the outfall structures shall bleed down one-half the volume of stormwater specified in paragraph (a), above, within 48 to 60 hours following a storm event, but no more than one-half of this volume will be discharged within the first 48 hours.

(c) Contain a permanent pool of water sized to provide an average residence time of at least 14 days during the wet season (June - October).

(d)1. Provide a littoral zone to be designed as follows:

a. The littoral zone shall be gently sloped (6:1 or flatter). At least 30 percent of the wet detention system surface area shall consist of a littoral zone. The percentage of littoral zone is based on the ratio of vegetated littoral zone to surface area of the pond at the control elevation.

b. The treatment volume should not cause the pond level to rise more than 18 inches above the control elevation unless the applicant affirmatively demonstrates that the littoral zone vegetation can survive at greater depths.

c. Eighty percent coverage of the littoral zone by suitable aquatic plants is required within the first twenty-four months of completion of the system or as specified by permit conditions.

d. To meet the 80% coverage requirement, planting of the littoral zone is recommended. As an alternative, portions of the littoral zone may be established by placement of wetland top soils (at least a four inch depth) containing a seed source of desirable native plants. When utilizing this alternative, the littoral zone must be stabilized by mulching or other means and at least the portion of the littoral zone within 25 feet of the inlet and outlet structures must be planted.

2. In lieu of the requirements of subparagraph 1., above, the applicant may provide either of the following:

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a. At least fifty percent additional permanent pool volume over that specified in paragraph (c), above; or

b. Treatment of the stormwater pursuant to subparagraphs 40C- 42.024(2)(b)2., 3., 4., or 6., F.A.C., prior to the stormwater entering the wet detention pond.

(e) Be designed so that the mean depth of the permanent pool is between 2 and 8 feet and the maximum depth does not exceed 12 feet below the invert of the bleed down device, unless the applicant affirmatively demonstrates that alternative depths will not inhibit the physical, chemical, and biological treatment processes or cause the resuspension of pollutants into the water column due to anaerobic conditions in the water column.

(f) Be designed so the flow path through the pond has an average length to width ratio of at least 2:1. The alignment and location of inlets and outlets should be designed to maximize flow paths in the pond. If short flow paths are unavoidable, the effective flow path should be increased by adding diversion barriers such as islands, peninsulas, or baffles to the pond. Inlet structures shall be designed to dissipate the energy of water entering the pond.

(g) Be designed so that bleed down devices incorporating dimensions smaller than three inches minimum width or less than 20 degrees for "v" notches shall include a device to eliminate clogging. Examples include baffles, grates, and pipe elbows.

(h) Be designed so that bleed down structure invert elevations are at or above the estimated post-development normal ground water table elevation. If the structure is proposed to be set below this elevation, ground water inflow must be considered in the drawdown calculations, calculation of average residence time, estimated normal water level in the pond, and pollution removal efficiency of the system.

(i) Provide for permanent maintenance easements or other acceptable legal instruments to allow for access to and maintenance of the system, including the pond, littoral zone, inlets, and outlets. The easement or other acceptable instrument must cover the entire littoral zone.

(j) Be designed so that the average pond side slope measured between the control elevation and two feet below the control elevation is no steeper than 3:1 (horizontal:vertical).

(k) Wet detention systems which have direct discharge to Class I, Class II Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting shall provide either of the following in addition to the requirements in paragraphs (b), (d), and (e) - (j), above:

1. An additional fifty percent of the applicable treatment volume specified in paragraph (a), above, and an additional fifty percent of the applicable permanent pool volumes specified in paragraphs (c) or subparagraph (d)2., above; or

2. Treatment pursuant to subsections (1), (2), (3) above, or (5) below, prior to discharging into a wet detention pond designed pursuant to paragraphs (a) - (j), above.

(5) Swale systems shall:

(a) Percolate 80% of the runoff from the three year, one-hour storm.

(b) Percolate the runoff from the three-year, one-hour storm for those swale systems which have direct discharge to Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting.

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(c) -- Provide the capacity for the given volume of stormwater pursuant to paragraphs (a) or (b), above, and contain no contiguous areas of standing or flowing water within 72 hours following the storm event referenced in paragraphs (a) and (b), above, assuming average antecedent moisture conditions. The storage volume must be provided by a decrease of stored water caused only by percolation through soil, evaporation or evapotranspiration.

(d) Meet the criteria in subsection 40C-42.021(29), F.A.C.

(6) Dry detention systems shall:

(a) Provide off-line detention of the first one inch of runoff or 2.5 inches of runoff from the impervious area, whichever is greater.

(b) Provide at least an additional fifty percent of the applicable treatment volume specified in subparagraph 1., above, for those systems which have direct discharge to Class I, Class II, Outstanding Florida Waters, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting.

(c) Be designed so that the outfall structures shall discharge one-half the appropriate treatment volume of stormwater specified in paragraphs (a) or (b), above, between 24 to 30 hours following a storm event.

(d) Be designed so that discharge structures shall include a device to prevent the discharge of accumulated sediment, minimize exit velocities, and prevent clogging. Examples include perforated riser enclosed in a gravel jacket and perforated pipes enclosed in sand or gravel.

(e) Contain areas of standing water for no longer than 3 days following a rainfall event.

(f) Be stabilized with permanent vegetative cover.

(g) Be designed so the average flow path through the basin has a length to width ratio of at least 2:1. The alignment and location of inlets and outlets should be designed to maximize flow paths in the basin. If short flow paths are unavoidable, the effective flow path should be increased by adding diversion barriers such as baffles to the basin.

(h) Be designed so inlet structures dissipate the energy of water entering the basin.

(i) Be designed to include a maintenance schedule for removal of sediment and debris on at least a bi-monthly basis from the basin and mowing and removal of grass clippings.

(j) Be designed so the basin floor is level or uniformly sloped toward the outfall structure.

(k) Be designed so that the basin floor and control elevation is at least one foot above the seasonal high ground water table elevation. Sumps may be placed up to one foot below the control elevation.

Specific Authority 373.044, 373.113, 373.118, 373.177, 373.418 FS. Law Implemented 373.413, 373.416, 403.813 FS. History--New 9-25-91. Amended 3-21-93, 6-15-93, 4-11-94, 7-20-95.

40C-42.0265 Design and Performance Criteria for Wetlands Stormwater Management Systems.

(1) The wetlands stormwater management system design and performance criteria and other provisions relating to such systems are an initial but necessary step by the District in a field in which there exists limited knowledge. In an effort to further refine the District's wetlands stormwater management system policies, monitoring data and other pertinent information relating to the performance criteria will be collected and analyzed and periodic reports of the results of this

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monitoring shall be made available to the public. The District must attempt to ensure that the wetlands stormwater management system is compatible with the ecological characteristics of the wetlands utilized for stormwater treatment and to ensure that water quality standards will not be violated by discharges from wetlands stormwater management system. To achieve these goals, specific performance criteria are set forth in this section for systems which incorporate wetlands for stormwater treatment.

(2) The only wetlands to be used for stormwater treatment are those:

(a) Which are isolated wetlands; and

(b) Which would be isolated wetlands, but for a hydrologic connection to other wetlands or surface waters via another watercourse that was excavated through uplands.

(3) Applications for wetland stormwater management systems shall be processed by the District as an individual permit application according to the administrative procedures set forth in chapter 40C-4, F.A.C.

(4) In the review of wetlands stormwater management system permit applications, the District shall consider the following:

(a) Compliance of the wetlands stormwater management system permit with the performance criteria specified in subsection 40C-42.0265(5).

(b) If the applicant is unable to show compliance with the performance criteria in subsection 40C-42.0265(5), the applicant shall qualify for a wetlands stormwater management system permit using alternative design and performance criteria if the applicant affirmatively demonstrates that the use of the wetlands is compatible with the ecological characteristics of the wetland and the applicant complies with the standards in section 40C-42.023, F.A.C.

(c) If the applicant proposes to dredge or fill in the wetlands used for stormwater treatment, the District in its review of the permit application shall evaluate the adverse effects of the dredging or filling on the treatment capability of the wetland.

(5) A showing by the applicant that the wetlands stormwater management system design complies with the performance criteria listed below shall create a presumption in favor of the issuance of the permit:

(a) The system complies with the requirements of section 40C-42.025 and subsection 40C-42.0265(2), F.A.C.

(b) The system is part of a comprehensive stormwater management system that utilizes wetlands in combination with other best management practices to provide treatment of the runoff from the greater of the following:

1. First one inch of runoff; or

2. 2.5 inches times the impervious area.

(c) Those systems which direct discharge to Class I, Class II, or Outstanding Florida Waters shall provide an additional fifty percent of the applicable treatment volume specified in paragraph (b), above.

(d) The wetlands stormwater management system must provide treatment for the runoff as specified in paragraph 40C-42.0265(5)(b) or (c), F.A.C., within the wetlands. The design features of the system shall maximize residence time of the stormwater within the wetland. The outfall structure shall be designed to bleed down one-half the volume specified in paragraph 40C-42.0265(5)(b) or (c) within the first 60 to 72 hours.

(e) Stormwater shall be discharged into the wetlands utilized so as to minimize the channelized flow of stormwater by employing methods including, but not limited to, sprinklers, overland flow or spreader swales.

(f) The use of wetlands for stormwater must meet the criteria in section 12.0, Environmental Considerations, of the Applicant's Handbook: Management and Storage of Surface Waters, adopted by reference in section 40C-4.091, F.A.C.

(6) In order to establish a reliable, scientifically valid data base upon which to evaluate the performance criteria and the performance of the wetlands stormwater management system, a monitoring program may be required. Monitoring programs shall provide the District with comparable data for different types of wetlands and drainage designs. Data to be collected shall include (unless irrelevant to the permitted system): sedimentation rate, sediment trace metal concentrations, sediment nitrogen and phosphorus concentrations, changes in the frequency, abundance and distribution of vegetation, and inflow and outflow water quality for nutrients, metals, turbidity, oils and greases, bacteria and other parameters related to the specific site conditions. Inflow and outflow water quality parameters will be monitored on such storm event occurrences as established by the District based on a site specific basis. The District shall eliminate the requirement to continue the monitoring program upon its determination that no further data is necessary to evaluate the performance criteria or ensure compliance with the performance criteria and applicable water quality standards.

Specific Authority 373.044, 373.113, 373.177, 373.418 FS. Law Implemented 373.413, 373.416 FS. History--New 9-25-91, 3-21-93, 10-3-95.

40C-42.027 Legal Operation and Maintenance Entity Requirements.

(1) The District considers the following entities to be acceptable for meeting the requirements necessary to ensure that a stormwater management system will be operated and maintained in compliance with the requirements of this Chapter and other District regulations in chapters 40C-4 or 40C-40, F.A.C.:

(a) Local governmental units including counties or municipalities, or Municipal Service Taxing Units established pursuant to section 125.01, F.S.;

(b) Active water control districts created pursuant to chapter 298, F.S., or drainage districts created by special act, or Community Development Districts created pursuant to chapter 190, F.S., or Special Assessment Districts created pursuant to chapter 170, F.S.;

(c) State or federal agencies; or

(d) Duly constituted stormwater, communication, water, sewer, electrical or other public utilities.

(2) The property owner or developer is normally not acceptable as a responsible entity when the property is intended to be subdivided. The property owner or developer shall be acceptable in any of the following circumstances:

(a) Written proof is furnished either by letter or resolution, that a governmental entity or such other acceptable entity as set forth in paragraphs (a)-(d) above, will accept the operation and maintenance of the stormwater management system at a time certain in the future;

(b) Proof of bonding or assurance of a similar nature is furnished in an amount sufficient to cover the cost of the operation and maintenance of the stormwater management system;

(c) The property is wholly owned by the permittee and ownership is intended to be retained. This would apply to a farm, corporate office or single industrial facility, for example; or

(d) The ownership of the property is retained by the permittee and is either leased or rented to third parties such as in shopping centers or mobile home parks.

(3) Profit or non-profit corporations including homeowners associations, property owners associations, condominium owners associations or master associations shall be acceptable only under certain conditions that ensure that the corporation has the financial, legal and administrative capability to provide for the long term operation and maintenance of the stormwater management system.

(4) Entity Requirements.

(a) If a multimember association such as a Homeowner, Property Owner, Condominium or Master Association is proposed, the owner or developer must submit Articles of Incorporation for the Association, and Declaration of Covenants and Restrictions, or such other organizational and operational documents which affirmatively assign authority and responsibility for the operation or maintenance of the stormwater management system.

(b) The Association shall have sufficient powers reflected in its organizational or operational documents to:

1. Operate and maintain the stormwater management system as permitted or exempted by the District;

2. Establish rules and regulations;

3. Assess members a fee for the cost of operation and maintenance of the system, and enforce collection of such assessments;

4. Contract for services (if the Association contemplates employing a maintenance company) to provide the services for operation and maintenance;

5. Exist in perpetuity. The Articles of Incorporation must provide that if the association is dissolved the stormwater management system shall be transferred to and maintained by an entity acceptable to the District as defined in this section. Transfer of maintenance responsibility shall be effectuated prior to dissolution of the association;

6. Enforce the restrictions relating to the operation and maintenance of the stormwater management system;

7. Provide that the portions of the Declarations which relate to the operation and maintenance may be enforced by the District in a proceeding at law or in equity; and

8. Require that amendments to the documents which alter the stormwater management system beyond maintenance in its original condition must receive District approval prior to taking effect.

(5) Phased Projects.

(a) If an Operation and Maintenance entity is proposed for a project which will be constructed in phases, and subsequent phases will utilize the same stormwater management systems as the initial phase or phases, the entity shall have the ability to accept responsibility for the operation and maintenance of stormwater management system for future phases of the project.

(b) If the development scheme contemplates independent operation and maintenance entities for different phases, and the stormwater management system is integrated throughout the project, the entities either separately or collectively shall have the authority and responsibility to operate and maintain the stormwater management system for the entire project. That authority shall include cross easements for stormwater management and the ability to enter and maintain the various systems, should any sub-entity fail to maintain a portion of the stormwater management system within the project.

(6) The applicant shall be an acceptable entity from the time construction begins until the stormwater management system is dedicated to and accepted by a legal entity established pursuant to this section. The applicant shall provide proof of the existence of an entity pursuant to this section or of the future acceptance of the system by an entity described in this section prior to initiating construction.

Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 403.812, 403.814 FS. History--New 4-1-86. Amended 9-25-91, 3-21-93.

40C-42.028 Operation Phase Permits.

(1) The operation phase of a stormwater management system permit which was designed by an appropriate registered professional does not become effective until all of the following criteria in this subsection and subsection (3) have occurred:

(a) Within 30 days after completion of construction of the stormwater management system, permittee shall submit a signed and sealed certification by an appropriate registered professional indicating that the system has been constructed and that the system is ready for inspection by the District.

(b) The certification prepared by a registered professional (not necessarily the project design registered professional but one who has been retained by the permittee to provide professional services during the construction phase of project completion) shall be made on form number 40C-1.181(13), As Built Certification by a Registered Professional.

(c) The registered professional shall certify that:

1. The system has been constructed substantially in accordance with approved plans and specifications, or;

2. Any deviations from the approved plans and specifications will not prevent the system from functioning in compliance with the requirements of this chapter. The registered professional shall note and explain substantial deviations from the approved plans and specifications and provide two copies of as-built drawings to the District.

(d) The certification shall be based upon on-site observation of construction (scheduled and conducted by the professional or by a project representative under his or her direct supervision) or review of as-built drawings for the purpose of determining if the work was completed in compliance with approved plans and specifications.

(e) As-built drawings shall be the permitted drawings revised to reflect any changes made during construction. Both the original and revised specifications must be clearly shown. The plans must be clearly labeled as "as-built" or "record" drawings. All surveyed dimensions and elevations required shall be certified by a registered surveyor. The following information, at a minimum, shall be verified on the as-built drawings:

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1. Dimensions and elevations of all discharge structures including all weirs, slots, gates pumps, pipes, and oil and grease skimmers;

2. Locations, dimensions, and elevations of all filter, exfiltration, or underdrain systems including cleanouts, pipes, connections to control structures, and points of discharge to the receiving waters;

3. Dimensions, elevations, contours, or cross-sections of all treatment storage areas sufficient to determine stage-storage relationships of the storage area and the permanent pool depth and volume below the control elevation for normally wet systems, when appropriate;

4. Dimensions, elevations, contours, final grades, or cross-sections of the system to determine flow directions and conveyance of runoff to the treatment system;

5. Dimensions, elevations, contours, final grades, or cross-sections of all conveyance systems utilized to convey off-site runoff around the system;

6. Existing water elevation(s) and the date determined; and

7. Elevation and location of benchmark(s) for the survey.

(2) The operation phase of a stormwater management system permit which was not designed by an appropriate registered professional does not become effective until all of the criteria in this subsection, and subsection (3) below, have occurred. Within 30 days after completion of construction of the stormwater management system, permittee shall submit a certification, on form number 40C-1.181(14), As Built Certification, that the system has been constructed in accordance with the design approved by the District and shall notify the District that the system is ready for inspection.

(3) The permittee shall submit documentation to the District showing that adequate provisions have been made for the operation and maintenance of the system and for meeting any special permit conditions. Entities which qualify to operate and maintain systems for purposes of this rule are listed at section 40C-42.027, supra. Documentation must include an affirmative indication that the entity intends to or agrees to take over maintenance responsibility for the system, unless the transfer is associated with the conversion of the construction permit to its operation phase and the maintenenac entity exists as approved under the permit.

(4) The permit will be converted from a construction permit to an operation permit once the project is determined to be in compliance with the permitted plans and an appropriate entity exists for maintenance of the system. The District will transfer the permit to the maintenance entity upon request, pursuant to section 40C-4.351, F.A.C., once all conditions for converting the construction permit to an operation permit have been met.

Specific Authority 373.044, 373.113, 373.171, 373.418 FS. Law Implemented 373.413, 373.416 FS. History--New 9-25-91, 3-21-93. Amended 7-20-95.

40C-42.029 Monitoring and Operational Maintenance Requirements.

(1) The operation and maintenance entity is required to provide for periodic inspections of the stormwater management system to insure that the system is functioning as designed and permitted. The entity shall submit inspection reports to the District, certifying that the stormwater management system is operating as designed. In addition, the entity will state in the report what operational maintenance has been performed on the system. The reports shall only be required for those systems which are subject to operation phase permits pursuant to subsection 40C-42.028(1),

F.A.C., after the effective date of this rule adoption, unless indicated otherwise in a permit. The reports shall be submitted to the District as follows unless otherwise required by a permit condition:

(a) Inspection reports for retention, underdrain, wet detention, swales, and wetland stormwater management systems shall be submitted two years after the completion of construction and every two years thereafter on form number 40C-1.181(15), Registered Professional's Inspection Report, for systems designed by a registered professional. For systems not designed by a registered professional, the inspection reports shall be submitted on form number 40C-1.181(16), Statement of Inspection Report. However, reports for those systems in sensitive karst areas must be submitted pursuant to paragraph (c) below.

(b) Inspection reports for dry detention, exfiltration, and pumped systems shall be submitted one year after the completion of construction and every two years thereafter on form number 40C-1.181(15), Registered Professional's Inspection Report. A registered professional must sign and seal the report certifying the dry detention, filtration, exfiltration, or pumped system is operating as designed. However, reports for those systems in sensitive karst areas must be submitted pursuant to paragraph (c) below.

(c) Systems in sensitive karst areas must be inspected monthly for the occurrence of sinkholes and solution pipes. The inspection reports for these systems must be submitted to the District annually on form number 40C-1.181(15), Registered Professional's Inspection Report, for systems designed by a registered professional. For systems not designed by a registered professional, the inspection reports shall be submitted on form number 40C-1.181(16), Statement of Inspection Report.

(2) Permittees which operate stormwater management systems that are designed and constructed to accept stormwater from multiple parcels within the drainage area served by the system shall notify the District annually of the stormwater discharge volumes of all new parcels which have been allowed to discharge into the system in the previous year and shall certify that the maximum allowable treatment volume of stormwater has not been exceeded.

(3) The following operational maintenance activities shall be performed on all permitted systems on a regular basis or as needed:

(a) Removal of trash and debris,

(b) Inspection of inlets and outlets,

(c) Removal of sediments when the storage volume or conveyance capacity of the stormwater management system is below design levels, and

(d) Stabilization and restoration of eroded areas.

(4) Specific operational maintenance activities are required, depending on the type of permitted system, in addition to the practices listed in subsection (3), above.

(a) Retention, swale and underdrain systems shall include provisions for:

1. Mowing and removal of grass clippings, and

2. Aeration, tilling, or replacement of topsoil as needed to restore the percolation capability of the system. If tilling or replacement of the topsoil is utilized, vegetation must be established on the disturbed surfaces.

(b) Exfiltration systems shall include provisions for removal of sediment and debris from sediment sumps.

(c) Wet detention systems shall include provisions for operational maintenance of the littoral zone. Replanting shall be required if the percentage of vegetative cover falls below the permitted level. It is recommended that native vegetation be maintained in the littoral zone as part of the system's operation and maintenance plan. Undesirable species such as cattail and exotic plants should be controlled if they become a nuisance.

(d) Dry detention systems shall include provisions for mowing and removal of grass clippings

(e) Systems in sensitive karst areas shall include provisions for the repair of any sinkhole or solution pipe that develops in the system.

(5) If the system is not functioning as designed and permitted, operational maintenance must be performed immediately to restore the system. If operational maintenance measures are insufficient to enable the system to meet the design and performance standards of this chapter, the permittee must either replace the system or construct an alternative design. A permit modification must be obtained from the District prior to constructing such alternative design pursuant to section 40C-4.331, F.A.C.

Specific Authority 373.044, 373.113, 373.171, 373.418 FS. Law Implemented 373.413, 373.416 FS. History--New 9-25-91. Amended 3-21-93, 4-11-94.

40C-42.031 Exemptions for Stormwater Management Systems.

Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 403.812, 403.814 FS. History--New 4-1-86. Amended 8-11-91. Repealed 9-25-91.

40C-42.032 Limiting Conditions.

(1) The Governing Board shall impose upon any permit granted pursuant to this Chapter such reasonable conditions as are necessary to assure that construction and operation of the permitted system will not be inconsistent with the District's permitting standards set forth in section 40C-42.023, F.A.C., and will not be harmful to the water resources of the District.

(2)(a) In addition to project-specific special conditions, the following standard limiting conditions shall be attached to all permits issued pursuant to this Chapter unless waived by the Board upon a determination that the conditions are inapplicable for the work authorized by a given permit:

1. This permit for construction will expire five years from the date of issuance unless otherwise specified by a special condition of the permit.

2. Permittee must obtain a permit from the District prior to beginning construction of subsequent phases or any other work associated with this project not specifically authorized by this permit.

3. Before any offsite discharge from the stormwater management system occurs, the retention and detention storage must be excavated to rough grade prior to building construction or placement of impervious surface within the area served by those systems. Adequate measures must be taken to prevent siltation of these treatment systems and control structures during construction or siltation must be removed prior to final grading and stabilization.

4. The permittee must maintain a copy of this permit complete with all conditions, attachments, exhibits, and permit modifications, in good condition at the construction site. The

complete permit must be available for review upon request by District representatives. The permittee shall require the contractor to review the complete permit prior to commencement of the activity authorized by this permit.

5. All activities shall be implemented as set forth in the plans, specifications and performance criteria as approved by this permit. Any deviation from the permitted activity and the conditions for undertaking that activity shall be considered a violation of this permit.

6. District authorized staff, upon proper identification, must be granted permission to enter, inspect and observe the system to insure conformity with the plans and specifications approved by the permit.

7. Prior to and during construction, the permittee shall implement and maintain all erosion and sediment control measures (best management practices) required to retain sediment on-site and to prevent violations of state water quality standards. All practices must be in accordance with the guidelines and specifications in chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (Florida Department of Environmental Regulation 1988), which are hereby incroporated by reference, unless a project specific erosion and sediment control plan is approved as part of the permit, in which case the practices must be in accordance with the plan. If site specific conditions require additional measures during any phase of construction or operation to prevent erosion or control sediment, beyond those specified in the erosion and sediment control plan, the permittee shall implement additional best management practices as necessary, in accordance with the specifications in chapter 6 of the Florida Land Development Manual: A Guide to Sound Land and Water Management (Florida Department of Environmental Regulation 1988). The permittee shall correct any erosion or shoaling that causes adverse impacts to the water resources.

8. If the permitted system was designed by a registered professional, within 30 days after completion of the stormwater system, the permittee must submit to the District the following: District Form No. 40C-1.181(13) (As Built Certification By a Registered Professional), signed and sealed by an appropriate professional registered in the State of Florida, and two (2) sets of "As Built" drawings when a) required by a special condition of this permit, b) the professional uses "As Built" drawings to support the As Built Certification, or c) when the completed system substantially differs from permitted plans. This submittal will serve to notify the District staff that the system is ready for inspection and approval.

9. If the permitted system was not designed by a registered professional, within 30 days after completion of the stormwater system, the permittee must submit to the District the following: District Form No. 40C-1.181(14) (As Built Certification), signed by the permittee and two (2) sets of "As Built" drawings when required by a special condition of this permit, or when the completed system substantially differs from permitted plans. This submittal will serve to notify the District staff that the system is ready for inspection and approval.

10. Stabilization measures shall be initiated for erosion and sediment control on disturbed areas as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven (7) days after the construction activity in that portion of the site has temporarily or permanently ceased.

11. Should any other regulatory agency require changes to the permitted system, the permittee shall provide written notification to the District of the changes prior to implementation so that a determination can be made whether a permit modification is required.

12. Within thirty (30) days after sale or conveyance of the permitted stormwater management system or the real property on which the system is located, the owner in whose name the permit was granted shall notify the District of such change of ownership. Transfer of this permit shall be in accordance with the provisions of section 40C-1.612, Florida Administrative Code. All terms and conditions of this permit shall be binding upon the transferee. The permittee transferring the permit shall remain liable for any corrective actions that may be required as a result of any permit violations prior to such sale, conveyance or other transfer.

13. The stormwater management system must be completed in accordance with the permitted plans and permit conditions prior to the initiation of the permitted use of site infrastructure. The system must be completed in accordance with the permitted plans and permit conditions prior to transfer of responsibility for operation and maintenance of the stormwater management system to a local government or other responsible entity.

14. The operation phase of the permit shall not become effective until the requirements of condition No. 8 or 9 have been met, the District determines that the system complies with the permitted plans, and the entity approved by the District in accordance with section 40C-42.027, F.A.C., accepts responsibility for operation and maintenance of the system. The permit cannot be transferred to such an approved responsible operation and maintenance entity until the requirements of section 40C-42.028, F.A.C., are met, and the operation phase of the permit becomes effective. Following inspection and approval of the permitted system by the District in accordance with section 40C-42.028, F.A.C., the permittee shall request transfer of the permit to the responsible approved operation and maintenance entity, if different from the permittee. Until the permit is transferred pursuant to subsection 40C-42.028(4), F.A.C., the permittee shall be liable for compliance with the terms of the permit.

15. Prior to lot or unit sales, or upon completion of construction of the system, whichever occurs first, the District must receive the final operation and maintenance document(s) approved by the District and recorded, if the latter is appropriate. For those systems which are proposed to be maintained by county or municipal entities, final operation and maintenance documents must be received by the District when maintenance and operation of the system is accepted by the local government entity. Failure to submit the appropriate final document will result in the permittee remaining personally liable for carrying out maintenance and operation of the permitted system.

16. This permit does not eliminate the necessity to obtain any required federal, state, local and special district authorizations prior to the start of any activity approved by this permit. This permit does not convey to the permittee or create in the permittee any property right, or any interest in real property, nor does it authorize any entrance upon or activities on property which is not owned or controlled by the permittee, or convey any rights or privileges other than those specified in the permit and Chapter 40C-42, F.A.C.

17. The permittee shall hold and save the District harmless from any and all damages, claims, or liabilities which may arise by reason of the activities authorized by the permit or any use of the permitted system.

18. The permittee shall immediately notify the District in writing of any previously submitted information that is later discovered to be inaccurate.

19. Activities approved by this permit shall be conducted in a manner which do not cause violations of state water quality standards.

(b) This section shall not be construed as a limitation on the authority of the Board to impose such other limiting conditions as may be necessary in order to assure that the permitted system is consistent with the requirements for issuance listed in section 40C-42.023, F.A.C.
Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 373.409, 373.413, 373.416, 373.419, 373.423, 373.426 FS. History--New 3-21-93, 10-3-95.

40C-42.033 Implementation.

(1) This chapter shall become effective on September 25, 1991.

(2)(a) Each construction permit issued under chapter 40C-42, F.A.C., prior to the effective date of this rule shall remain valid according to its terms.

(b) Each construction permit application which is filed with the District prior to the effective date of this rule will be processed and evaluated under the rules implemented on April 1, 1986.

(c) Each construction permit application which is not filed with the District prior to September 25, 1991, will be processed and evaluated according to the rule provisions implemented on September 25, 1991.

(3) If the validity of any provisions of chapter 40C-42, F.A.C., or the application thereof to any person or circumstance is challenged pursuant to Chapter 120 or 373, F.S., or pursuant to any other basis in law, it is the intent of the Governing Board of the St. Johns River Water Management District that neither a challenge to the validity of a provision or application thereof nor the invalidation of a provision or application thereof shall affect the validity or application of other provisions of the rule which can be given effect without the challenged or invalidated provision or application and to this end the provisions of chapter 40C-42, F.A.C., are declared severable.
Specific Authority 373.044, 373.113, 373.171, 373.429 FS. Law Implemented 373.416 FS. History--New 9-25-91.

40C-42.035 Stormwater General Permits.
Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 403.812, 403.814 FS. History--New 4-1-86. Repealed 9-25-91.

40C-42.041 Individual Permit Requirements for New Stormwater Discharge Facilities.
Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 403.812, 403.814 FS. History--New 4-1-86. Repealed 9-25-91.

40C-42.061 Relationship to Other Permitting Requirements.

(1) Whenever the construction, alteration, removal, operation, maintenance, or abandonment of a stormwater management system requires that an environmental resource permit be secured pursuant to Chapters 40C-4 or 40C-40 , F.A.C., the requirements in this chapter shall be reviewed as part of those permit applications. A separate permit application under this chapter shall not be required. However, the applicant must provide the required technical information as part of those applications to demonstrate compliance with this chapter. If the applicant requests a separate environmental resource stormwater permit, the applicant must notify the District of any other District permits, exemptions, or certifications which have or will be requested for the project.

(2) When a permit is required pursuant to this chapter and an individual environmental resource permit is required pursuant to chapter 40C-4 for the same system, the time frames of chapter 40C-4 shall apply to issuance of a permit under section 40C-42.024(2), F.A.C.

(3) This rule does not apply to any stormwater discharge facility listed in (a) and (b) below, unless such facility is modified pursuant to section 40C-42.024, F.A.C.:

(a) Which was in existence on February 1, 1982; or

(b) Which was permitted, modified, or found to be exempt, under Chapter 62-25, F.A.C., by the Department of Environmental Regulation (DER) after February 1, 1982, but prior to April 1, 1986, provided the facility was constructed in accordance with the DER permit or exemption, and is functioning in accordance with the requirements of chapter 62-25, F.A.C.

(4) The operation phase permit requirements set forth in subsection 40C-42.028(1), F.A.C., shall not apply to systems permitted and found to be in compliance with all rule requirements prior to the effective date of this rule.

(5) Applications for conceptual agency review of stormwater management systems, as required by section 380.06, F.S., will be reviewed in accordance with the procedure used by the District to review conceptual approval permit applications pursuant to subsection 40C-4.041(2), F.A.C.

(6) Systems for agricultural lands will be regulated under chapter 40C-44, F.A.C.

Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 373.413, 373.416, 380.06(9) FS. History--New 4-1-86. Amended 9-25-91, 3-21-93, 4-11-94, 7-20-95, 8-3-95.

40C-42.071 Permit Processing Fee. There shall be a non-refundable permit processing fee as specified by section 40C-1.603, F.A.C., payable to the District at the time that an application for a permit is submitted.

Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 373.109, 373.113 FS. History--New 4-1-86. Amended 9-25-91.

40C-42.081 General Provisions. Nothing under this chapter shall preclude:

(1) Stormwater effects from being considered in the evaluation of other types of permits where such consideration is relevant to a determination of compliance with applicable District requirements.

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(2) The legal joinder in a permitting proceeding under this chapter of any person who owns or controls an unpermitted stormwater management system or systems which comprise a significant portion of the stormwater management system.

(3) The District from taking appropriate legal action including but not limited to the requiring of a permit to prevent the impairment of a use for which a water of the state has been designated under chapter 62-3, F.A.C.

(4) The District from entering interagency or interlocal agreements to accomplish the provisions of this chapter.

Specific Authority 373.044, 373.113, 373.171 FS. Law Implemented 403.812, 403.814 FS. History--New 4-1-86. Amended 9-25-91.

40C-42.091 Publications Incorporated by Reference.

(1) The Governing Board adopts by reference Part I "Policy and Procedures", Part II, "Criteria for Evaluation", and Part III "Operation and Maintenance", of the document entitled "Applicant's Handbook: Regulation of Stormwater Management Systems, Chapter 40C-42, F.A.C.", effective 10-3-95.

(2) This document provides information regarding the stormwater management system permitting program

(3) A copy of this document may be obtained by contacting:
Director, Division of Permitting Data Services,
St. Johns River Water Management District,
P.O. Box 1429,
Palatka, Florida 32178-1429

St. Johns River Water Management District,
7775 Baymeadows Way, Suite 102
Jacksonville, Florida 32256

St. Johns River Water Management District,
618 East South Street, Suite 200,
Orlando, Florida 32801

St. Johns River Water Management District,
305 East Drive,
Melbourne, Florida 32904

Specific Authority 120.54(8), 373.044, 373.113, 373.171, 373.418 F.S. Law Implemented 373.413, 373.416, 373.426. History--New 4-11-94. Amended 7-20-95, 10-3-95.

40C-42.900 Forms and Instructions. The following forms and instructions incorporated by reference have been approved the Governing Board and are available upon request from:

Department of Resource Management
St. Johns River Water Management District
P.O.Box 1429
Palatka, Florida 32178-1429.

(1) Joint Application For Environmental Resource Permit/Authorization to Use State Lands/Federal Dredge and Fill Permit , form number 40C-4.900(1) adopted 10-3-95 .

(2) As Built Certification by a Registered Professional, form number 40C-1.181(13), adopted March 21, 1993.

(3) As Built Certification, form number 40C-1.181(14), adopted 3-21-93.

(4) Registered Professional's Inspection Report, form number 40C-1.181(15), adopted 3-21-93.

(5) Statement of Inspection Report, form number 40C-1.181(16), adopted 3-21-93.

Specific Authority 120.53(1), 373.044, 373.113, 373.118 FS. Law Implemented 120.52(16), 120.53(1), 373.085, 373.116, 373.118, 373.103, 373.106, 373.229, 373.413 FS. History--New 5-30-90. Amended 9-25-91, 3-21-93, 2-27-94, 10-3-95.

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Chapter 6

Stormwater and Erosion and Sediment Control Best Management Practices for Developing Areas

This chapter contains a comprehensive summary of BMPs used for stormwater management and erosion and sediment control. Part 1 discusses various non-structural source controls that can be used to reduce the generation and accumulation of potential stormwater contaminants. Part 2 discusses structural stormwater BMPs that can be used to reduce the pollutant load discharged from stormwater systems. Part 3 discusses erosion and sediment control BMPs that can be used to reduce erosion and retain sediment on-site, especially during construction.

The BMP guidelines represent a summary of the best available information at the time of publication. However, the state-of-the-art is still quite young and these guidelines will probably change as new research is completed and as we gain more experience with using the various BMPs. Design engineers and others in the development community are encouraged to send the department information about actual experiences with the BMPs so that the guidelines can be periodically updated.

The erosion and sediment control BMP descriptions have been largely taken verbatim from the Virginia Erosion and Sediment Control Manual although the information was "Florida-ized" by the Soil Conservation Service and others. These BMP descriptions are written in the form of mandatory standard and specifications because of Virginia's Erosion and Sediment Control Act. It is not the intention of the department to require strict compliance with these standards although they do represent excellent guidelines based on years of actual implementation.

Engineers are encouraged to use the information presented in this chapter in conjunction with their own expertise to assure that the BMPs will be properly designed and constructed for their particular site and situation.

CHAPTER 6

STORMWATER AND EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES FOR DEVELOPING AREAS

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STORMWATER AND EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES FOR DEVELOPING AREAS

INTRODUCTION

Chapters 1 through 4 of this manual discuss the threat which stormwater runoff, as well as construction and development in urbanizing areas, may pose to the quality of Florida waters. Chapter 6 consists of descriptions and guidelines for various management practices used for urban stormwater pollution abatement and erosion and sediment control. The treatment measures discussed herein have been divided among three categories and are presented in three separate sections of the chapter as follows:

1. Nonstructural Controls for Reducing Urban Stormwater Pollutants: Practices that are intended to improve runoff quality by reducing the generation and accumulation of potential stormwater runoff contaminants at or near their sources.

2. Structural Stormwater Controls: Practices that are aimed at controlling the volume and discharge rate of runoff from urban areas, as well as, reducing the magnitude of pollutants in the discharge water through physical containment or flow restrictions designed to allow settling, physical removal through filtration, percolation, chemical precipitation or flocculation, and/or biological uptake.

3. Erosion and Sediment Controls: Practices that can be used to prevent and/or correct problems related to the transport of eroded material or soil by runoff waters particularly from construction and other land disturbing activities.

It should be emphasized that practices for controlling erosion and sedimentation from development-related land-disturbing activities are an integral part of the collection of urban BMP's presented in this manual. The erosion and sediment control BMPs have been compiled extensively from information contained in the Virginia Erosion and Sediment Control Handbook and the Virginia Urban Best Management Practices Handbook, published by the Virginia Soil and Water Conservation Commission, and the Virginia State Water Control Board. Their efforts early on in the field of stormwater management and erosion control have helped to make the task of developing a similar set of guidelines for Florida much easier. Their cooperation is greatly appreciated and acknowledged by the State of Florida as is that of the State Office of the Soil Conservation Service, members of the Florida Engineering Society and water management district staff who helped to modify the BMPs to Florida conditions.

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OVERVIEW OF PRACTICES

Following is a summary of stormwater management practices recommended for use in Florida. These practices are numbered to facilitate cross-referencing and designation of their use on stormwater plans.

NONSTRUCTURAL SOURCE CONTROLS

2.01 - Fertilizer Application Control: This practice involves managing the use of fertilizer so as to keep it on the land and out of our waterways. Implementation will result in maximum effectiveness of the nutrients on vegetation and reduced nutrient loads in our waterways. The practice covers concepts such as public education, the need for soil testing, and the proper timing of fertilizer applications.

2.02 - Pesticide Use Control: This practice involves eliminating excessive pesticide use by proper application procedures and the use of alternatives to chemical pest control. The goal is to reduce the load of pesticide-related contaminants in urban stormwater runoff. The practice covers legal requirements for pesticide application, methods of application, equipment cleaning, disposal of unused chemicals and empty containers, pesticide storage, alternative pest control methodologies, and public education. Both commercial-scale application and private home use are discussed.

2.03 - Solid Waste Collection and Disposal: This practice involves the routine management and handling of urban refuse, litter and fallen leaves in ways that will prevent their becoming water pollutants. Recommendations range from municipal trash and leaf collection and disposal operations to public education concerning collecting procedures and schedules to concepts such as recycling wastes. Responsibility for implementation lies equally with the municipality and the citizenry.

2.04 - Source Control on Construction Sites: This practice encourages the use of good management and "housekeeping" techniques on construction sites to reduce the availability of construction-related pollutants that contaminate runoff water and, where runoff contamination cannot be avoided, to retain the pollutants and polluted water on the site. Concepts covered include erosion and sediment control, equipment maintenance and repair, storm sewer inlet protection, trash collection and disposal, the use of designated washing areas for cleaning equipment, proper material storage, dust control at demolition sites, use of proper sanitary equipment and pesticide use control.

2.05 - Street Cleaning: This practice involves sweeping, vacuuming, flushing, or otherwise cleaning streets, parking lots and other paved

vehicular traffic areas. The objective is to remove dry-weather accumulations of pollutants, especially fine particulate matter, before washoff can occur, thus reducing the potential for pollution impacts on receiving waters. In the past, street cleaning operations were conducted primarily for aesthetic purposes; however, they are now known to be an effective method for improving the quality of runoff.

STRUCTURAL RUNOFF CONTROLS

3.01 - Concrete Grid and Modular Pavement: This practice involves the use of a special pervious paving material in low traffic areas. The pave-pavement consists of concrete grids or other structural units alternated with pervious fillers such as sod, gravel or sand. The resultant pavement provides an adequate bearing surface and yet allows a significant amount of infiltration thereby reducing runoff volume, discharge rate, pollutant load and improving the water quality.

3.02 - Detention Basins: This practice involves the construction or modification of surface water impoundments in a manner which will protect downstream areas from potential water quality degradation, flooding, and stream channel degradation due to upstream urban development. The objective is to detain stormwater and release it at a controlled rate. Downstream water quality is improved through sediment removal, plant uptake of nutrients, chemical transformations, and other processes.

3.03 - Exfiltration Trenches: This practice involves the excavation of pits or trenches which are backfilled with sand and/or graded aggregates. Stormwater runoff from impervious surfaces can be directed to these facilities for detention and infiltration. Permeable soils are a prerequisite. The potential for groundwater pollution must also be carefully evaluated.

3.04 - Grassed Waterways and Swales: This practice involves using grassed surfaces to reduce runoff velocities, enhance infiltration and remove runoff contaminants, thus improving runoff quality and reducing the potential for downstream channel degradation and sediment pollution.

3.05 - Parking Lot Storage: This practice involves the use of impervious parking areas or landscape islands as temporary impoundments during rainstorms. Parking lot stormwater systems can be designed to temporarily detain stormwater in specially designated areas, and release it at a controlled rate. The objective is to protect down-stream areas from increased flooding, stream channel degradation and pollutant loads caused by urban development. It is important that these facilities be designed to minimize potential safety hazards and inconvenience to motorists and pedestrians.

3.06 - Porous Asphalt and Concrete Pavement: This practice involves the use of a special asphaltic or concrete paving material which allows stormwater to infiltrate at a high rate. Infiltration water is stored below the pavement in a high-void aggregate base. This practice provides for stormwater detention and, in some cases, increases infiltration into the ground. Use of the practice can contribute to reduced sewer overflows, decreased flooding and stream channel degradation, and improved water quality. This type of pavement offers many other benefits not related to water quality, including enhanced visibility, increased safety and reduced drainage system costs.

3.07 - Retention Basins: This practice pertains to the construction of infiltration reservoirs or basins (usually dry) to provide complete on-site storage of a specific volume of stormwater runoff. For pollution control purposes, these facilities are usually designed and constructed to divert and percolate runoff volume associated with the first flush of stormwater pollutants leaving the site. The practice incorporates both pollution control and groundwater recharge concepts into the design. Such facilities are practical wherever soil permeability is sufficient to allow rapid percolation between storms. They are especially applicable in parts of Florida where rapid urbanization in coastal areas and salt water encroachment present a hazard to potable water supplies. Potential groundwater contamination may be a problem associated with these systems and must always be considered in their design.

3.08 - Rooftop Runoff Disposal: This practice encourages the disposal of rooftop runoff by systems and techniques that avoid or replace direct connections of roof drainage systems to stormsewer systems. The objective is to help reduce storm sewer flows. Proposed alternatives to sewer connection include surface drainage through swales, subsurface infiltration, and runoff collection and storage.

3.09 - Storage/Treatment: This practice involves the use of some water treatment unit operations applied at such a scale that they are less involved and less costly than treatment plant technology. These procedures are most applicable when used in conjunction with other best management practices to remove contaminants from collected stormwater. Unit operations considered applicable are the physical processes of settling, filtration, and screening; and the chemical processes of flocculation and disinfection.

3.10 - Underdrains and Stormwater Filter Systems: This practice usually consists of a conduit, such as a pipe and/or a travel filled trench which intercepts, collects, and conveys drainage water following infiltration and percolation through the soil, suitable aggregate, and/or filter fabric. Underdrain or filtration systems may be used in combination with a variety of stormwater management measures where

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space, soil permeability or high water table conditions limit the magnitude of pollutant removal that can be achieved through natural percolation, sedimentation, or other means. Pollutant removal primarily occurs as the prescribed volume of stormwater passes through the sand, gravel, and filter cloth which usually surrounds the conduit.

EROSION AND SEDIMENT CONTROL PRACTICES

Following are summary overviews of the erosion and sediment control practices recommended for use in Florida. The practices are numbered according to the following categories of use:

Structural Practices

- Road Stabilization (1.01 - 1.04)
- Sediment Barriers (1.05 - 1.14)
- Dikes and Diversions (1.15 - 1.24)
- Sediment Traps and Basins (1.25 - 1.29)
- Flumes (1.30 - 1.34)
- Waterway and Outlet Protection (1.35 - 1.44)
- Miscellaneous Structural Contours (1.50 - 1.59)

Vegetative Practices

- Site Preparation for Vegetation Establishment (1.60 - 1.64)
- Grass Establishment (1.65 - 1.74)
- Mulches (1.75 - 1.79)
- Other Vegetation (1.80 - 1.84)
- Miscellaneous Vegetative Control (1.85 - 1.99)

In each category, some numbers were left unassigned to facilitate future practice additions or modifications. Summaries of the individual practices follow:

1.01 - **Temporary Gravel Construction Entrance**: A gravel pad, located at points of vehicular ingress and egress on a construction site, to reduce the mud transported onto public roads and other paved areas.

1.02 - **Construction Road Stabilization**: Temporary stabilization with stone of access roads, subdivision streets, parking areas and other traffic areas immediately after grading to reduce erosion caused by vehicles during wet weather, and to prevent having to regrade permanent roadbeds between initial grading and final stabilization.

1.05 - **Straw Bale Barrier**: A temporary sediment barrier composed of straw bales placed across or at the toe of a slope to intercept and detain sediment and decrease flow velocities from drainage areas of

limited size; applicable where sheet and rill erosion from low to moderate channel flows may be a problem. Maximum effective life is 3 months.

1.06 - Silt Fence: A temporary sediment barrier constructed of posts, filter fabric and, in some cases, a wire support fence, placed across or at the toe of a slope or in a minor drainageway to intercept and detain sediment and decrease flow velocities from drainage areas of limited size; applicable where sheet and rill erosion or small concentrated flows may be a problem. Maximum effective life is 6 months.

1.07 - Brush Barrier: A temporary sediment barrier composed of limbs, weeds, vines, root mat, soil, rock and other cleared materials pushed together to form a berm; located across or at the toe of a slope to intercept and detain sediment and decrease flow velocities.

1.08 - Storm Drain Inlet Protection: The installation of various kinds of sediment trapping measures around drop inlet or curb inlet structures prior to permanent stabilization of the disturbed area; limited to drainage areas not exceeding one acre, and not intended to control large, concentrated stormwater flows.

1.15 - Temporary Diversion Dike: A ridge of compacted soil located at the top or base of a sloping disturbed area to divert off-site runoff away from unprotected slopes and to a stabilized outlet, or to divert sediment-laden runoff to a sediment trapping structure. Maximum effective life is 18 months.

1.16 - Temporary Fill Diversion: A channel with a supporting ridge on the lower side cut along the top of an active earth fill to divert runoff away from the unprotected fill slope to a stabilized outlet or sediment trapping structure; applicable where the area at the top of the fill drains toward the exposed slope and continuous fill operations make the use of a Temporary Diversion Dike unfeasible; maximum effective life is one week.

1.17 - Temporary Right-Of-Way Diversion: A ridge of compacted soil or loose gravel constructed across a disturbed right-of-way or similar sloping area to shorten the flow length within the disturbed strip and divert the runoff to a stabilized outlet. Earthen diversions are applicable where there will be little or no construction traffic within the right-of-way, and gravel structures are applicable where vehicular traffic must be accommodated.

1.18 - Diversion: A permanent channel with a ridge on the lower side constructed across a slope to reduce slope length and intercept and

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divert stormwater runoff to a stabilized outlet to prevent erosion on the slope.

1.25 - Temporary Sediment Trap: A small ponding area, formed by constructing an earthen embankment with a gravel outlet across a drainage swale, to detain sediment-laden runoff from small disturbed areas for enough time to allow most of the sediment to settle out. Maximum effective life is 18 months.

1.26 - Temporary Sediment Basin: A basin with a controlled stormwater release structure, formed by constructing an embankment of compacted soil across a drainageway, to detain sediment-laden runoff from disturbed areas greater than 5 acres for enough time to allow most of the sediment to settle out. Can be constructed only where there is sufficient space and appropriate topography. Maximum effective life is 18 months unless designed as a permanent pond by a qualified professional engineer.

1.30 - Temporary Slope Drain: A flexible or rigid tube or conduit, used before permanent drainage structures are installed, intended to conduct concentrated runoff safely from the top to the bottom of a disturbed slope without causing erosion on or below the slope.

1.31 - Paved Flume: A permanent concrete-lined channel constructed to conduct concentrated runoff from the top to the bottom of a slope without causing erosion on or below the slope.

1.35 - Stormwater Conveyance Channel: A permanent channel designed to carry concentrated flows without erosion. Applicable to man-made conveyances, including roadside ditches, and to natural channels that need modification to accommodate increased flows generated by land development. Not applicable for stormwater treatment.

1.36 - Outlet Protection: The installation of paved and/or riprap channel sections and/or stilling basins below storm drain outlets to reduce erosion from scouring at outlets and to reduce flow velocities before stormwater enters receiving channels below these outlets.

1.37 - Riprap: A permanent, erosion-resistant ground cover of large, loose, angular stone usually underlain by erosion matt or filter fabric installed wherever soil conditions, water turbulence and velocity, expected vegetative cover, etc., are such that soil may erode under design flow conditions.

1.38 - Check Dams: Small, temporary dams constructed across a drainage ditch to reduce the velocity of concentrated flows, reducing erosion of the swale or ditch. Limited to use in small open channels which drain 10 acres or less; should not be used in live stream.

1.39 - Waterway Drop Structure: A permanent structure or series of structures designed to step water flow down a slope without causing channel erosion; applicable in natural or man-made channels with long, relatively steep reaches.

1.40 - Level Spreader: An outlet for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope to convert concentrated, sediment-free runoff to sheet flow and release it onto areas of undisturbed soil stabilized by existing vegetation.

1.50 - Subsurface Drain: A perforated conduit installed beneath the ground to intercept and convey groundwater. Prevents sloping soils from becoming excessively wet and subject to sloughing, and improves the quality of the vegetative growth medium in excessively wet areas by lowering the water table. Can also be used to drain detention structures.

1.60 - Surface Roughening: Grading practices such as stair-stepping or grooving slopes or leaving slopes in a roughened condition by not fine-grading them. Reduces runoff velocity, provides sediment trapping and increases infiltration, all of which facilitate establishment of vegetation on exposed slopes. Applicable to all slopes steeper than 3:1 or that have received final grading but will not be stabilized immediately. Also recommended for other exposed slopes.

1.61 - Topsoiling: Preserving and using topsoil to provide a suitable growth medium for vegetation used to stabilize distrubed areas. Applicable where preservation or importation of topsoil is most cost-effective method of providing a suitable growth medium; not recommended for slopes steeper than 2:1.

1.65 - Temporary Seeding: Establishment of temporary vegetative cover on disturbed areas by seeding with appropriate rapidly-growing plants on sites that will not be brought to final grade for periods of 30 days to one year.

1.66 - Permanent Seeding: Establishment of perennial vegetative cover by planting seed on rough-graded areas that will not be brought to final grade for a year or more or where permanent, long-lived vegetative cover is needed on fine-graded areas.

1.67 - Sodding: Stabilizing fine-graded areas by establishing permanent grass stands with sod. Provides immediate protection against erosion, and is especially effective in grassed swales and waterways or in areas where an immediate aesthetic effect is desirable.

GUIDELINES FOR USING
NONSTRUCTURAL SOURCE CONTROLS

SW BMP 2.01

FERTILIZER APPLICATION CONTROL

Definition

Managing the use of fertilizer so as to keep it on the land.

Purpose

To prevent fertilizer nutrients from reaching watercourses. The same management procedures will assure maximum effectiveness of the nutrients on land, reduce the load on waste treatment plants, and save money.

Conditions Where Practice Applies

Fertilizers are used everywhere in urban areas. Sites include parks, cemeteries, plant nurseries, roadsides and medians, golf courses and other "green" areas; grounds of institutions, business and industrial establishments; and individual home lawns and gardens.

Planning Considerations

Excessive nitrogen and phosphorus in water bodies deplete their oxygen, stimulate algal growth and, in aggravated cases, cause eutrophication and stagnant conditions that require drastic measures to correct.

Collectively the amount of fertilizer runoff from urban areas, because of their size and the geographic concentration of activities, can be a signficant factor in water quality. At a minimum any increment from fertilizers increases the burden routinely imposed on receiving waters by the normal urban waste load. In extreme cases the nutrient load discharged to watercourses, from whatever sources, has required municipalities to install expensive advanced wastewater treatment to reclaim the water.

In any circumstance, any diminution of fertilizer runoff will be a positive contribution to water quality. This contribution should hold particular charm since the basic remedy consists simply of eliminating excessive use and holding what is used in its intended place to do its intended job. This saves money!

The kinds of fertilizer and methods of application used by managers of large areas will differ from those used by private individuals on home lawns and

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gardens. The focus of concerns may also differ. But the same common-sense principles apply for both categories.

Landscaping supervisors, developers, golf course superintendents and others dealing with large areas and routinely concerned with the cost element will not likely use excess fertilizer or fertilize at unfavorable times. They may need to give more heed to other aspects, including prior site preparation and later maintenance.

Homeowners, however, may apply fertilizer in the wrong weather or season. And some -- apparently under the familiar logic that if one aspirin is good, two or three are bound to be better -- are known to use far more fertilizer (and pesticides) on lawns and gardens than they need. Since built-up residential areas border streets or other drainageways that can transport pollutants quickly to waterways, misuse or over-application of fertilizer in residential areas and washoff of the excess can cumulatively register a significant adverse impact on water quality.

Education

To reduce waste treatment costs as well as nonpoint source water pollution, municipalities may find it worthwhile to remind property owners and occupants of the potential for water quality degradation inherent in misapplication or excessive use of fertilizers (and of pesticides). Reminders periodically enclosed with water and sewer bills might prove most effective for reducing the problem if they bring home the point of savings to the taxpayer in his own as well as the public budget. The notices should go to institutions, businesses and industries as well as homeowners.

The County Agricultural Extension Service also has educational pamphlets that can help property owners understand fertilizer requirements of lawns, shrubs and gardens. These will help teach fertilizer users how to determine how much they need and when and where to apply the fertilizer.

Erosion Control

Whenever fertilizer is used to aid in vegetative establishment on bare soil areas, erosion control is of primary importance in preventing fertilizer washoff. Soil, enriched with fertilizer nutrients, can be easily eroded and carried away in runoff if adequate soil stabilization techniques are not used.

Straw mulch, chemical soil stabilizers, and degradable ground covering fabrics are examples of techniques which can be used to protect the soil from erosion during vegetative establishment. Applicable erosion control techniques should be applied wherever the potential for soil erosion exists during vegetative establishment. In Maryland, it has been shown that the application of temporary vegetative cover (rye-grass) on construction sites

where bare ground will be left open for more than a week can reduce soil loss by up to 90%. Similar recommendations are applicable in Florida, especially in the panhandle where slopes may exceed 3% and the soil texture is fine.

"Commercial"-Scale Fertilizer Use

Procedures for large-scale application of fertilizer resemble those for agricultural operations. Large-area users -- institutional, business, industrial and governmental -- should obtain guidance on fertilizer management from specialists such as those of the Florida Cooperative Extension Service and USDA, Soil Conservation Service or private firms.

Residential Area Use

Homeowners may also obtain advice on lawns and gardens from field extension agents of the Cooperative Extension Service. Soil testing is available at the nominal charge of $3.00 to determine lime and fertilizer needs.

Among other reasons for a soil test, extension specialists recommend it in the interest of conservation of soil nutrients -- to avoid the application of unnecessary nutrients. They point out that a soil may well need nitrogen (N) but need little phosphorus (P) or potassium (K) -- yet in the absence of a test the homeowner may needlessly apply a fertilizer high in all three nutrients when lower doses of P and K would do.

When used in gardens granular fertilizer should be worked into the soil, which preferably should be moist at the time of application. The granular form will be less apt to wash away than sprays or slurries, especially when these are carelessly applied. However, liquid applications, as currently practiced by a growing number of home lawn maintenance companies, are considered to be just as resistant to runoff as the granular form.

Organic fertilizers -- compost, manures, etc. -- are less soluble than formulated chemical fertilizers. However, specialists note that in many if not most instances the organics are applied at heavier rates in order to feed the soil over longer periods of time. In such cases, they report, the amount that may find its way to watercourses through erosion may be as great as or greater than the amount lost from formulated fertilizers.

Others advocate wider use of compost. An extra benefit of its use will be to create a market for the compost, which can be generated in quantity from municipal refuse and/or sewage sludge. It is necessary, however, to ensure that the heavy metals content of the composted domestic sludge or refuse is within safe limits if the material is used on soil to grow foodstuff or feed. The criteria for the application of these materials on agricultural lands is listed in Florida Administrative Code 17-7, Section 17-7.54 (2, 3, 4, & 5) F.A.C.

Timing the Applications

In fertilizing lawns with chemicals the prevalent habit of many homeowners is to "wait until the storm clouds gather" and then spread the material just ahead of the rain. The effect can be precisely the reverse of what is desired, and the worst result for water quality. However, applying fertilizer under dry weather conditions is dangerous as salt injury to the vegetation could result. The extension recommendation is to make the application when there is already adequate soil moisture and little likelihood of immediate heavy rain -- then sprinkle the lawn. Thus the material will have been incorporated into the soil before the next rain can take it away.

General Guides

Landscaping - Proper landscaping of new developments will minimize the needs for fertilizer. The process of cutting, filling and grading soils if improperly carried out can produce low fertility, acidity, compaction, and excessive dryness or wetness. Topsoil removed during excavation or site development must always be put back in place afterwards, and revegetation started promptly. Topsoil should never be carried off from the site. Erosion and sediment control should be assured. For establishment of new lawns, turf mats or grass sod are recommended in preference to seeding.

Testing - A soil test is recommended, especially for new lawns, to assure the use of optimum lime and fertilizer application rates. Extension specialists advocate a repeat test at least every three years.

Season for Application - The kind of turf being maintained should determine the time for fertilizing. Cool season turf (ryegrass) should be fertilized in the fall and early winter. Warm season grasses (Bermudas, Bahia, Centipede and St. Augustine) should be fertilized in the spring and summer.

A supplemental application of low nitrogen is also usually recommended in the fall. Once again, the rate of application should be determined according to a soil test whenever possible.

SW BMP 2.02

PESTICIDE USE CONTROL

Definition

Eliminating excessive pesticide use by proper application procedures and/or the use of alternatives to chemical pest control.

Purpose

To reduce the pesticide load in stormwater runoff from urban areas.

Conditions Where Practice Applies

Wherever pesticides are used in urban areas. Sites include grounds of institutions, business and industrial establisments of all kinds; rights-of-way of roads, power lines, pipelines and railroads; construction projects; parks, recreation areas, plant nurseries, fairgrounds, zoos, cemeteries, water bodies, wooded and other "green" areas; dumps and landfills; home lawns and gardens.

The term "pesticides" is construed broadly to cover chemicals used against pests of all kinds -- insecticides to kill insects; herbicides to kill weeds, brush or other unwanted vegetation; fungicides to control fungi that cause molds, rots, plant and animal diseases; nematicides to kill nematodes, the minute eel worms in soil that attack plant roots; rodenticides to kill rats and other rodents.

Planning Considerations

General

Pesticides are poisons. In water as on land they can cause acute toxicity or might cause insidious effects in the food chain. Persistent pesticides pass unchanged through conventional waste treatment plants. Gross amounts of some of these can kill the bacteria that are essential to break down other wastes in the treatment process.

Because of the great variety of uses to which pesticides are put and the near universality of their use in one form or another, the collective amount reaching watercourses in runoff from urban areas is significant. Pesticides vary widely in toxicity and persistence. However, since all are intended to kill something, caution in their use is always essential.

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Excessive applications and misuse are the most immediate problems. On the premise that more of anything is better, the widespread tendency is to use an excess. Since built-up residential areas border streets or other drainageways that can transport pollutants quickly to watercourses, the cumulative over-application of pesticides on home lawns and gardens from which washoff (or aerial drift) can carry away the chemicals is an important part of the picture. Total use on large open spaces is the other main urban component.

Common acceptance of a few simple guidelines can significantly reduce the pesticide load to watercourses. Expert advice is available from County Agriculture Extension Agents and other state agencies.

Prevention is the best control for any problem. The first question in considering the possible use of any pesticide must be whether it is necessary at all. On this score it should be kept in mind that pest control is never absolute since it is biologically impossible to eradicate all pests. The goal is to reduce their effects to acceptable levels. In this context there may be alternatives to pesticides which, in the long term, may be much less costly than the chemical.

Where alternatives are not found, the broad objective is to prevent overtreatment. Eliminating excessive pesticide use will save money for all users, private and public.

Experts provide these general guidelines for pesticide use:

- Other factors being equal, one should use the least toxic chemical that will accomplish the purpose.
- Pesticides that degrade rapidly are less apt than others to become water pollutants.
- Pesticides with low solubility in water are less apt than others to cause water pollution through drainage and runoff. Loss of such chemicals can be greatly reduced by preventing erosion.
- Some pesticide formulations have a broad spectrum of activity. These should be used whenever possible instead of serial applications of highly specific materials.

Legal Requirements

Pesticides are regulated by several federal and state agencies, operating under a variety of statutes. The most significant federal statute is the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), which has been amended several times since its enactment in 1947. The United States

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Department of Agriculture (USDA) administered FIFRA until 1970, when the United States Environmental Protection Agency (EPA) was created.

FIFRA emphasizes pesticide registration and labeling requirements as the means to ensure that pesticides, used according to label instruction, will be safe. EPA must approve all pesticide labels and use compliance with label requirements is mandated: "The label is the law."

In Florida, the Department of Agriculture and Consumer Services (DACS) maintains the state pesticide registration program, licenses dealers of state pesticide registration program, licenses dealers of restricted-use pesticides, and inspects foodstuffs for quality and safety. DACS may also certify applicators.

The Department of Health and Rehabilitative Services (DHRS) shares applicator certification authority with DACS. DHRS administers the Florida Pest Control Act (Chapter 482, F.S.) and DHRS supervises pest control activities in many non-agricultural areas, including residences and businesses.

Because of possible "unreasonable adverse effects in the environment" and potential injury to persons applying them, restricted-use pesticides may only be applied by or under the "direct supervision" of certified applicators.

State standards require licensing for commercial and public applicators working in any of the following categories of pest control. The categories are:

- Industrial, institutional, structural and health-related
- Right-of-Way
- Ornamental and turf
- Aquatic
- Public health
- Regulatory (for public agencies controlling regulated pests)
- Demonstration and research
- Seed treatment
- Forest
- Agricultural, for treatment of farm plants and animals by applicators other than farmers
- Aerial application

In addition, farmers, nurserymen and others who would use restricted pesticides on their own property or in their business also must obtain certification to be "private applicators."

It is intended that all categories of licensed applicators must be informed on product labeling, safety, nature of the pests and pesticides, equipment application techniques, laws and regulations, and the potential environment consequences of the use and misuse of pesticides as may be influenced by such factors as:

a) Weather and other climatic conditions;

b) Types of terrain, soil or other substrate;

c) Presence of fish, wildlife and other non-target organisms; and

d) Drainage patterns.

However, both federal and state law define "direct supervision" such that the certified applicator only "control" the pesticide use. His or her physical presence is not required. Given a large number of applicators and few inspectors, significant amounts of restricted-use pesticides are used by persons who may not have been instructed about the environmental and health risks involved.

DHRS certifies applicators in a variety of categories including fumigation, general household pest control, lawn and ornamental pest control and termite control. An examination is required for each specialty. Certificates must then be reviewed annually. Although reports of spills and of container disposal methodology are not required, DHRS rules require immediate notification of cases of accidental human poisoning, and routine reports of names, amounts, uses, dates and places of application of restricted-use pesticides.

DACS certification of pesticide applicators is somewhat less rigorous than DHRS's. In order to take the DHRS exam, formal educational or training requirements must be satisfied, whereas DACS only requires that applicants pass the DACS exam. Prior to an early 1983 rule change, DACS "private applicators" were exempt from examination and recordkeeping requirements. DACS now requires all applicators to be certified but recertification is only required quadrennially. Because of a new class of examinees (private applicators) and reduction in application fees, it is understandable that DACS increased the time requirements for recertification. However, as a result new information about the environmental hazards of certain pesticides may not reach pesticide applicators in a timely fashion under these revised certification procedures.

In contrast to the detailed certification and training requirements to which commercial applicators are subject, few legal restraints are placed upon the individual citizen in the application of pesticides. While it is unlawful for any person to use or to dispose of containers of unused portions of pesticides in a manner inconsistent with label directions, the impracticality of policing and enforcing stringent requirements throughout a state population is self-evident. Complaints can be acted on. However, education and voluntary restraint by the citizen offer the only currently realistic answer to the problem.

All-Purpose Guides

Certain considerations pertinent across-the-board to large- and small-scale users of pesticides are discussed here. Factors of concern particularly to one or the other category are covered in separate sections for each.

1) Safety - Proximity to people, human habitations, animals and water, and the topography in relation to all of them, require more than normal consideration in urban areas. These factors must be weighed from the safety standpoint, before any plans are made final for selection of chemicals, actual treatment, and fund outlays. Conscious effort will be needed in some areas to anticipate unexpected appearance and unpredictable patterns of children and pets even though none may normally be in the vicinity.

   Home users in residential areas, where children and pets are regularly close at hand, need to keep them in mind not only throughout actual application of the chemicals but in choosing the sites for storing containers and application equipment to assure that these are out of reach at all times.

   Disposal of unused pesticides and "empty" containers requires as much care as application of the chemicals. In getting rid of containers, users will want to give thought not only to safeguarding children and others at the premises but to protecting the safety of refuse collectors who will pick up the discards, and the safety of final handlers at the municipal landfill.

   Urban area governments that permit any open burning are diminishing in number. Even where such burning is allowed, pesticide containers should preferably not be burned. They should never be burned in built-up areas. Herbicide containers must never be burned. Certain other pesticides also carry a "No Burning" label.

2) Sources of Advice - Technical advice on pesticide use is available throughout the state from local agents of the Cooperative Extension Service operating through the University of Florida, Institute of Food and Agricultural Sciences Extension Division. Advice on the disposal of pesticides and containers is available from the same sources, or the Bureau of Groundwater Management, Florida Department of Environmental Regulation, and from the Florida Department of Agriculture and Consumer Services (FDACS).

3) Selecting the Materials and Methods of Application - The physical form in which a pesticide chemical is formulated may have an impact on its potential for water pollution. Timing and weather conditions will be crucial in the application of some materials. Topography is an obvious basic. Broad guides by category of

material follows.

Dusts - Are highly susceptible to wind drift, not only when being applied but also after they reach their target. If dusting offers the only acceptable control practice, the operation should be carried out during the early morning or late evening hours when there is little or no air movement. The distance between the application equipment and the target is also a factor to consider.

Sprays - May be in the form of solutions, emulsions or suspensions. Droplet size is an important factor in determining susceptibility to wind drift. Large droplets fall faster and are less likely to contaminate non-target areas. Here again, apply during periods of low air movement. Ground sprays followed by soil incorporation are not likely to be a source of water pollution unless excessive erosion occurs.

Granular formulations - Are applied to either the surface of the ground or below the soil surface. Surface applications may or may not be followed by soil incorporation. Pollution from granular formulations is unlikely unless heavy runoff or erosion occurs soon after treatment. Loss of granular formulations can be controlled for the most part with adequate soil conserving practices.

Fumigants - Must be kept in place for specific lengths of time in order to be effective. Containment methods include soil compaction, water seal, and sealing of the area with a plastic cover. Most fumigants act rapidly and degrade quickly. Consequently, water pollution is usually not a problem.

Antimicrobial paints and other surface coatings - Are designed to resist weathering and are therefore not considered as likely sources of pollution. Empty containers, however, should be disposed of in accordance with the rules for all pesticide containers.

Preplant treatments - Seed, roots, tubers, etc., are frequently treated with pesticides prior to planting. Treatment is usually by dust, slurry or liquids. Little pollution hazard exists from use of treated plant parts. Care must be taken, however, in disposing of unused treated plant parts and residual treatment materials. The same standards applicable to disposal of other pesticides should be observed.

4) Dosage - The universal rule is: Never exceed the manufacturer's dosage recommendations. At times, amounts less than the label recommends may be used. Consult the experts.

5) Leftovers - The most effective way to minimize the disposal problem is to prevent accumulation of a surplus. A careful evaluation of needs should be made in advance and purchases limited to a one-year or season supply. Methods of disposal of chemicals and containers are described in subsequent sections. Even a small residue can be a source of water pollution.

"Commercial" Scale Pesticide Use

With the constant introduction of new and sometimes more effective pesticides and occasional banning of some products when unanticipated detrimental effects or hazards emerge, the first rule of commercial applicators must be to stay abreast of developments. Owners or operators of facilities requiring the services of applicators will want to assure that their own employees having direct responsibility in this field keep informed. Exterminators and other professional applicators operating their own services obviously must be certified. Persons such as golf course superintendents, nursery and tree maintenance personnel, some industrial and institutional employees and certain municipal employees will also need state certification. Additionally, any individual actually applying pesticides in large amounts should be certified, not just the individual's employer or supervisor.

Protection of Water Sources During Preparation and Cleanup

Large-scale users in their planning and operations will have as a particular concern the prevention of water source contamination both during the mixing and preparation of chemicals for application and in the cleaning of equipment and disposal of unused pesticides and "empty" containers after treatment.

Surface water, subsurface water and pipeline distribution systems must be kept in mind throughout the preparatory and cleanup stages as well as during actual treatment. The pointers that follow are those offered farm users.

Lake or stream - If water is removed from these sources for mixing or cleanup it should be withdrawn with a pumping system separate from that of the pesticide application equipment if at all possible. Equipment should not be driven into the stream or lake for filling and cleaning. Equipment flushing should take place in an area where runoff of pesticides can be avoided. If the equipment must be filled at the stream or lake, only a suction line should be placed in the water. The equipment should be driven to another location for dumping.

Groundwater - Toxic chemicals should not be placed on the soil where there is a danger of contaminating subsurface water through percolation or through rock fissures. Groundwater contamination could occur through a pressurized system using a well as a supply. Anti-backflow devices should be used on hose connections if the hose will

come in contact with the chemical during mixing and filling operations.

Pits used for dumping flush water should be impervious enough to avoid contamination by percolation and be designed to professional standards.

Pressurized Distribution Systems - The largest danger here is the siphoning effect that can be created by other users drawing water concurrently with filling or flushing operations. All hose connections should be equipped with anti-backflow devices.

Additional precautions include the following:

- Avoid storage of pesticides in pumphouses or other buildings adjacent or in close proximity to streams, ponds, lakes, canals, or wells from which application equipment is filled.
- Pesticides should not be mixed and application equipment should not be filled, emptied, or repaired where spilled pesticides could drain or be washed into streams, ponds, canals or other bodies of water.
- Aprons and sumps should be constructed at the loading site to catch any overflow and drainage.
- Check valves should be installed on all intake hoses to prevent back-siphoning from sprayer tanks, particularly if the same pump is used for both filling and spraying.
- A filler hose should be suspended so as to provide an air space between the house and the surface of the spray mix in a full tank to prevent back-siphoning.
- Stay with the sprayer while filling. Do not let it run over while unattended.

Disposal of Unused Pesticides

The following possibilities should be considered before undertaking final disposal:

1) Use small quantities for the purpose intended in accordance with product label directions until supplies are exhausted.

2) Return any undamaged, unopened containers to the dealer or manufacturer.

After these options are exhausted, other possible disposal methods include:

1) Incineration (where facilities are available) at appropriate temperatures and times to cause complete destruction of the pesticide.

2) Disposal by burial in a specifically designated landfill.

3) Soil injection, but only with specific professional guidance.

4) Chemical methods suitable to degrade or detoxify pesticides to forms which are not hazardous to the environment.

Excess pesticides should never be disposed of:

- In a manner inconsistent with the product label or labeling directions.
- So as to cause or allow opening dumping of a pesticide.
- So as to cause or allow opening burning of a pesticide.
- So as to cause or allow water dumping or ocean dumping except in accordance with established regulations.

Disposal of Containers

Containers should be allowed to drain in vertical position for some 30 seconds after normal emptying. The container should then be rinsed three times with water or other diluting material being used, allowing 30 seconds for draining after each rinse. A good rule of thumb is to refill the container 1/4 to 1/5 full for each rinse: (i.e., use one quart of water or diluting material for each gallon container; one gallon for 5-gallon containers; and five gallons for 30- or 55-gallon drums). Each rinse should be drained into the spray tank.

Pesticide containers should not be re-used even after the triple rinse procedure has been completed.

Containers in good condition may sometimes be returned to the pesticide manufacturer or formulator or drum reconditioner for re-use with the same chemical class of pesticide previously contained. Other rinsed metal containers should be punctured to facilitate drainage, and crushed before transporting to a facility for recycle as scrap metal or for disposal. Containers may be buried in designated landfills.

Users of pesticides should obtain information from the Department's Bureau of Groundwater Protection and Waste Management on special recommendations and

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precautions that may be necessary for the disposal of some chemical containers.

Any specific disposal directions or procedures on pesticide product labels must be carefully followed.

Disposal of containers should be supervised by someone qualified and licensed for the application and handling of pesticides. The disposal of the containers is as much a part of proper handling as is the application of the chemical to the target area.

Storage of Unused Pesticides

Different chemicals require different types of facilities for proper storage. The following are basic principles which should be followed when selecting a storage facility or location:

1) The site should provide adequate protection against excessive heat, cold and moisture.

2) Storage facilities should not be subject to flooding.

3) The site selected should lend itself to preventing contaminated runoff if leakage should occur.

4) Pesticides should not be stored longer than the maximum time recommended by the manufacturer, as leakage may develop.

5) Facilities should provide for security to prevent non-qualified individuals from dispensing the chemicals.

6) Manufacturer's storage recommendations should be followed in order to maintain the integrity of the chemical.

The storage facility should be maintained in an "as-built" condition.

Residential Use

Easily the most important all-purpose single rule for home area users of pesticides to observe, if they look no further, is the experts' advice. Follow the manufacturer's instructions on the label. Never exceed its recommendations and remember that sometimes lesser amounts will be enough. The label message additionally includes the target point for application on plant or soil; the recommended application times (early morning or late evening, when temperatures are down and the air is still); safety advice, and referrals to Extension Service guidance. Heeding the advice of experts to "follow the label" translates to protection of water quality through

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eliminating the excessive or misplaced pesticide that is most apt to become available for runoff.

Conscious consideration by all residents during their use of pesticides can materially expand the beneficial impact of proper use. Hopefully, this awareness will extend to consideration of the forms of pesticide least likely to reach waterways, as summarized earlier, as the preferred forms to buy and use where a choice is possible.

Application

To get the pesticide onto its intended target and nowhere else, these general guides are offered:

1) Physical form: Granular formulations are generally preferable to liquids because application losses are lower.

2) Placement: Apply pesticides in a narrow rather than wide band; do not broadcast them over an entire lawn area. Spot spray infected areas rather than apply excess amounts of pesticides as an insurance against pests. Never apply over impervious surfaces. This precaution especially applies to water sprays.

3) Time of application: Pesticides should be used when they will have the greatest effect. Pesticides should be sprayed only when wind speeds are less than 7 mph. Spray in the early morning or ate dusk when wind speeds are usually at their lowest. Air temperatur should range between 40° - 80°F.

Before and After

Householders will want to use the same care in preparing for use and in cleaning their smaller pesticide application equipment as is recommended for large area equipment. Added precautions for the home user include taking care not to rinse equipment in driveways, roads, drainageways and other impervious areas. Pesticides should also never be disposed of in stormwater, sanitary or combined sewer systems.

No amount of leftover chemicals, small or large, should be thrown away into the environment. Small leftovers should be used up if possible rather than stored -- but used always according to the directions for regular use. "Empty" containers should always be cleaned before they are thrown away. See the recommendations for rinsing and cleaning larger containers under "Disposal of Container" -- but note that home users must also follow different procedures.

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Disposal of containers by urban householders should be the home refuse receptacles for municipal collection -- but the containers must always first be rendered unusable and then thoroughly wrapped to prevent harm to anyone and to minimize later harm to the environment.

Until better methods are developed, pesticide specialists urge observance of the following procedures by home users for disposing of "empty" small containers including one-gallon or smaller vessels for liquids and five-pound or smaller bags for solid pesticides:

- Glass containers: Triple rinse thoroughly, break the glass, and wrap in several layers of newspaper.
- Metal containers: Triple rinse thoroughly, puncture, and wrap in several layers of newspaper.
- Bags and inner liners: Wrap in several layers of newspaper after triple rinsing.
- Put the package in the trash or garbage receptacle used for other refuse to be picked up by the collection service.
- **"NEVER FLUSH"** pesticides down the toilet, nor pour leftover material into the sewer system **OR** into watercourses.

Education

As with fertilizer use, municipalities may wish to remind citizens of the potential for water pollution inherent in overuse of pesticides, and how to avoid it. Brief advices might be enclosed periodically with sewer and water bills. Reminders might note the possible savings to the taxpayer in both his own and the local government budget from reducing nonpoint source pollution. Such notices, soliciting responsible citizens' help, might also serve the interests of reducing waste treatment plant problems or costs and eliminating problems with pesticides at landfills. The notices should go to institutions, businesses and industries as well as householders.

Garden clubs and similar groups might elect to institute their own educational program.

Alternatives to Pesticides

Chemicals are by no means the sole weapon to control pests. Natural controls have always operated and continue to operate, otherwise insects would have taken over the world.

However, alternatives available to urban facilities and residents are distinctly more limited than those successfully used in agriculture or forestry. The reason is chiefly a matter of scale. Large areas and a span of time typically are needed for major "biological" or other non-chemical measures to exert their impact. Additionally, expert supervision is sometimes needed.

However, all urban dwellers and facilities operators have at hand a pair of elementary and universally proved preventives for pests, and some alternative controls that in some situations can either obviate the need for chemical pesticides entirely or reduce the amount needed.

Prevention

The preventives are cleanliness and avoidance of continuing dampness. Rubbish and refuse heaps, indoors or out, invite insects and rodents. Good sanitation prevents the creation of such breeding nests and grounds for pests. Keeping the lid tight on refuse receptacles is the simplest of all steps, yet often overlooked. Areas constantly damp invite fungi and insects, endangering molds, other plant diseases and rot. Drying out reduces the future problem, even though other remedies may be needed initially. Draining stagnant pools of water from any open containers, old tires or other rubbish left lying outdoors to collect rainfall will remove breeding grounds for mosquitoes and some other insects, may reduce the need to spray for them somewhat.

Control Alternatives

Such sophisticated approaches as sterilization of male insects, and the use of synthesized female insect sex hormones to lure males to traps -- both now successful in special cases -- are beyond ordinary application. Individual measures with some pertinence for urban use include:

1) Crop rotation - An age-old farm practice useful in reducing damage from certain nematodes, soil-borne insects and plant diseases. It has little or no effect on controlling weeds or the insects themselves. For the gardener who has enough space, moving the location of the garden may be a partial answer especially for nematode control.

2) Biological controls - One of the most venerable is the use of "milky spore disease" to control Japanese Beetle grubs. The bacterium B.thuringiensis controls the cabbage looper and other such caterpillars. The material is available to the residential gardner as a dust or liquid from many garden supply stores. Other biological controls can be investigated with the help of local agents of the Cooperative Extension Service.

3) Mechanical controls - Bug lights, insect strips, screens and mesh nets have their uses against flying insects.

4) Eradication of alternate hosts - A straightforward method of dealing with certain plant diseases and fungi that require more than one host species in order to complete their life cycles. The method simply breaks the life cyle by removing one of the host species. It is used in this state on cedar apple rust, a fungus that first infects red cedar trees -- a common Florida species -- and then must move to apple and crab trees to complete its life. The fungus can be controlled, especially in orchard areas, by removing or reminding the homeowner not to plant red cedars in the area. The method has little or no value for control of insects or weeds. Extension Service personnel can help determine in some other cases whether a situation exists that can be improved by eradication of a host.

I.P.M.

Encompassing all approaches is a technique called Integrated Pest Management. I.P.M. involves the reduction of pest problems by the application of combination of control methods based on a thorough understanding of the life system of the pest. It attempts to combine the best features of biological, chemical, cultural and mechanical control. Several applications are in use, such as the combination of crop rotation with use of resistant crop varieties. Programs are still in the developmental stage, and much research remains to be done. More emphasis is now being placed on putting I.P.M. principles into practice. Extension personnel will have the latest information.

Individual citizens as well as facilities operators will want to keep an eye on I.P.M., which has as its objective the achievenment of acceptable pest control with a minimum of chemical pesticides.

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SOLID WASTE COLLECTION AND DISPOSAL

Definition

Elements of a municipally regulated program of refuse collection, litter control and leaf disposal.

Purpose

To manage the handling of urban refuse, litter and fallen tree leaves routinely in ways that will prevent their becoming water pollutants. Effective systems will also provide traditional benefits in health protection, nuisance abatement, fire safety and aesthetics.

Conditions Where Practice Applies

Wherever refuse, litter and leaves accumulate. Principal urban sources of refuse are residential areas; industrial and commercial areas; streets, sidewalks, and alleys; vacant lots and unmaintained green spaces. Principal sources of leaf accumulations are residential areas; parks and other managed green spaces; and some commercial areas such as malls and shopping centers.

Planning Considerations

Urban refuse, litter and tree leaves, if washed away in runoff, can quickly become water pollutants. The practical means to prevent their doing so is a coordinated municipal program combining effective systems of refuse collection, litter control and leaf disposal. The closer the control is extended to the sources of accumulation, the more effective the program will be. The most effective program will be the one that establishes good control at the originating premises.

The traditionally recognized benefits of nuisance abatement, reduction of fire hazards, improved aesthetics and in particular, health protection form improved insect and rodent control, will continue to be the primary benefits of such a program. They furnish the justification for it.

Improved water quality is an additional benefit. Nonpoint source pollution can be generated from refuse, litter and leaves when these are uncontainerized or where poor practices are followed in loading and unloading collection vehicles.

Resource recovery will also be a constant consideration in the total program in the future. Wherever economics of scale and available facilities make possible the institution of any measures to recover even portions of wastes for recycling and reuse, these steps will have to be instituted to claim the fuel potential and to reduce the drain on other dwindling natural resources, as well as to extend the life of landfills. To the extent that resource recovery reduces the total volume of wastes, it will automatically provide further protection of water quality by reducing the quantity of contaminants that may reach watercourses directly in runoff or leach into them from landfills.

A resource recovery approach may be based on separation of salvageable wastes at their sources for collection by the municipality and disposal to processors for recycling. Or, if the population is sufficiently large, a full-scale recovery and processing facility may be developed by a local jurisdiction or two or more jurisdictions jointly. Source separation will be necessary where no central recovery facility or operation exists. Urban officials say source separation is satisfactory for recycling effort, but that to operate a large resource recovery program it is better (having a central plant) to separate at the recovery plant itself. They note that in large areas it is expensive and labor intensive to collect separated wastes at the source.

The key to either program is adequate containerizing of the wastes. A conscious and continuing effort to inform the public is an absolute prerequisite.

The overall, long-term objective must be prevention--to cut down the total volume of waste generated in the first place.

The Problem, and Some Classifying

The components of urban waste include a multitude of materials from a variety of sources. The quantities and characteristics vary with the time of year, geographic location, and habits of a population. "Solid" waste is construed to take in all putrescible and non-putrescible wastes except body wastes. Included are garbage, rubbish, paper, ashes, autos, old tires, street sweepings, dead animals, cast-off appliances and furniture, hospital wastes, dead vegetation, tree stumps, construction debris, institutional and industrial solid wastes.

For convenience of classification along the practical lines of the systems used for handling and control, such material may be categorized as either refuse or litter, depending upon the condition and/or location in which it occurs. In general, it may be considered refuse when concentrated at individual premises and packaged or contained; it is litter when diffuse, scattered, or of such size or quantity as not to be amenable to handling in

routine collection service. Thus in a broad sense, litter once packaged or contained becomes refuse.

Fallen tree leaves and other vegetation may become water pollutants directly when they are raked into swales and street gutters. These actions may also increase pollution indirectly by blocking storm sewer inlets, thus aggravating flooding. Public education to teach citizens about these adverse effects is a vital part of any refuse control program.

Expert Assistance Overall

Ultimate disposal of solid waste is governed by regulations of the Florida Department of Environmental Regulation (Chapter 17-7 F.A.C.). Its Division of Waste Management (2600 Blairstone Rd., Tallahassee, FL 32399-2400) should be consulted for advice on special problems.

The System Pattern

Necessity and convention have set the pattern for handling urban waste material routinely discarded directly from private property. Consideration for water quality on a continuing basis may well improve the efficiency of the system.

On-Premises Storage

Maintenance of adequate sanitary facilities for temporarily storing refuse on private premises prior to collection is considered a responsibility of the individual householder or business. Not only is proper on-premises storage essential from a sanitation standpoint, but the efficiency of the entire collection and disposal system depends to a considerable degree on the extent of individual cooperation accorded this initial storage phase. Ordinances governing the sanitation program and containing specifications for home storage are essential, but the most desirable approach for improving home storage conditions lies in public education. Enforcement should have a minor role relative to the dependence to be placed on the willingness of individuals to cooperate when they are made aware of the hazards and nuisances associated with insanitary practices.

Education

Local requirements for refuse collection must be brought to the attention of every householder to ensure compliance. Instructions should be distributed as necessary stating the specifications for containers, separation of wastes by type, where to place containers for collection, established collection schedules, and schedule changes when made. The notices should explain the reasons for the requirements--including water quality protection. Violations will still occur. For such cases, some localities refuse to pickup waste materials which are improperly placed, packaged, or separated for disposal. Several have found it helpful to attach a tag to the container outlining the

nature of the violation. Most householders usually will comply, although follow-up will still be necessary in a few instances.

Storage Containers

Receptacles for the temporary storage of refuse should be designed specifically for the waste to be stored. They should be covered and the bottoms leakproof. Since the loaded container must be hoisted to the collection vehicle, often by one man, the size should be given consideration and limits should be specified in the regulatory ordinance itself.

In some localities where refuse collection is performed by private contractors, governments leave the entire program to the contractor. Often, the result is that no standards are set. The range of size and types of containers should be specified by ordinance regardless of who performs the collection service.

Some cities furnish plastic bags for rubbish, and replace full bags with empty ones. Those containers used to store garbage should be washed at frequent intervals.

Refuse Collection

Refuse collection itself has little impact on nonpoint pollution. The connection between the two lies in the loading of the refuse collection vehicle and the travel of the vehicle along its route and to the disposal site. The objective is essentially to reduce the amount of refuse that becomes litter (uncontainerized waste). Refuse collection crews should be instructed to use caution when emptying trash cans or otherwise loading their vehicles in order to limit amounts of the material blown either from the cans or out of the vehicle hopper during the loading activities. This is especially important on windy days. The local authority can minimize the blowing of litter from the collection vehicle hopper by requiring that the vehicle's compaction mechanism be used at each collection stop. This cleans the hopper and moves the waste material into the enclosed body of the truck before the vehicle is driven to the next collection stop. However, this compaction policy notably reduces collection efficiency and thus increases costs.

The refuse collection vehicle itself should be fully enclosed and watertight. This will prevent solids from blowing out of the truck and liquids from leaking from it. Periodic inspections and preventive maintenance of the collection vehicles should assure that these attributes of the vehicle are not impaired.

Operations at the waste disposal site also are important in reducing nonpoint pollution. The area of particular concern is the blowing of the waste

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materials from the vehicles as they are unloaded or blowing of wastes, particularly paper, from the disposal site itself. The effects of both occurrences can be controlled through the use of enclosed unloading areas in the case of incinerators or transfer stations and the use of appropriate fencing around sanitary landfills, including portable litter control fences that surround the active disposal area.

Litter Control

Litter is defined as "uncontainerized solid waste." Litter is the visible trash found along roadsides, vacant lots, sidewalks and parks. Non-routine discards from individual households, such as old appliances, and large-quantity wastes from all sources including households must also be considered for their potential as litter and for the special handling that must be provided for them in order to have a complete disposal program for all contingencies.

Most litter is biodegradable and in water will create an oxygen demand as it decomposes. It also will act as a transporting agent for bacteria, pesticides, heavy metals and other pollutants. In sufficient quantity and depending on its nature, litter is a pollutant and should be removed before it becomes available for transport by stormwater runoff.

There are seven major sources of litter. These sources should be the target of any litter control program.

1) **Household Waste**: Containerization is a must for routine wastes in residential areas. Trash collectors should report all violations or messy conditions to their superiors.

2) **Commercial and Industrial Wastes**: Containerization is again a requirement. Since the volume and/or nature of waste from these areas can be formidable, frequent inspection is recommended. The source should be held responsible for day-to-day cleanliness of the immediate area around storage areas. Collection agencies should be held responsible for cleaning up material they may spill during pickups.

3) **Hauling Vehicles**: Haulers of any loose material should be required to cover the load in transit. Trucks and other hauling equipment should have sealed bottoms to prevent leaks or seepage.

4) **Loading Docks**: Loading docks can generate large volumes of litter. Docks should be swept and, at places where food is handled (for example, restaurants), they should be washed daily, but not into nearby stormsewers. Strict enforcement is required to eliminate this major source of litter.

5) Construction Site: Construction activities yield large amounts of solid waste. Special practices are recommended for nonpoint source pollution control on such sites. In addition, daily policing is recommended to ensure that "good housekeeping" on these sites becomes routine.

6 & 7) Motorists and Pedestrians: Contrary to popular belief, these two sources of litter account for less than 25% of it all. However, because they are on the move, enforcement is difficult. Strict enforcement can help create a psychological climate promoting observance of the law. Vacant lots and other vegetated areas should be made secure as feasible against illegal dumping.

Elements of Litter Control

There are four major components of a good litter control program.

1) Technology (and Costs): In addition to collection equipment, localities must provide a secure and safe means for either landfilling the collected litter or transferring it to users who will recycle it. Oversized discards are especially costly to remove. Some municipalities have suggested a special tax or disposal fee at the time of purchase to cover the ultimate disposal costs of such items.

2) Periodic Cleanup Campaigns to ensure continuing results.

3) Education: If the public remains apathetic or does not comply with the program, it is doomed to failure. Information programs should be conducted both in the school system and for the adult population. In localities that charge for trash pickup, information flyers can be inserted with the bill.

4) Law Enforcement: Compliance with the ordinance(s) is basic to the success of any litter control program. Police and, if necessary, health and sanitation workers should be delegated authority to enforce local ordinances. Checkups conducted for possible violations can be useful. Checkups conducted promptly in the wake of special cleanup campaigns may be particularly effective for establishing a climate of acceptance.

Leaf Disposal

Vegetative litter transported in stormwater runoff can add significant organic and nutrient pollution to receiving streams. Leaves may also be washed to the grates covering entrances to storm sewers effectively blocking the stormwater from entering the system. They thus aggravate urban flooding and increase the volume of uncontrolled runoff carrying pollutants to streams.

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The smoke from leaf burning in built-up areas is a hazard to persons with respiratory ills, and can be a nuisance to others. When leaves are burned, the ash is reported to contain a significant amount of phosphorus. If burning is done in street gutters or ditches, the phosphorus carried by stormwater can increase the nutrient load to streams. Many urban localities now ban leaf burning. This prohibition makes a proper collection and disposal system for vegetative litter more essential than in the past.

Leaves may be shredded for mulch, plowed into a garden, or composted to provide important ingredients of good soil for lawns and gardens. However, shredded leaves left on the lawn may form an impermeable thatch that can damage grass.

Planning the System

In addition to considerations of the volume of material to be handled, the equipment and manpower needed, the necesary disposal areas, and methods of financing, planning must take into account the seasonal nature of the problem and the special demands this will place on the system.

Ordinances should require that leaves be bagged and stored away from drainageways until they are collected. The ordinance should specify the preferred method of storage for pickup. Bagging is usually the most practical method. Other means may be specified if a locality has equipment for collecting loose leaves. However, where leaves are held loose in bulk for pickup, extra care is required to keep them out of drainageways pending collection.

Leaf collection programs can be expensive. Some localities have private contractors provide the service for a fee from property owners.

The scope and cost of a collection program can be reduced by householders' mulching or composting of leaves at their homesites. A further alternative for the municipality after collecting leaves, is to provide shredded leaves or leaf compost to residents for their use.

Citizens should be made aware of all the factors and alternatives involved in the development of an effective leaf disposal system, with emphasis on the benefits to both home soil water quality and the municipal budget to be realized by resort to the conservation approach.

Resource Recovery

While total systems to salvage all potentially reusable major components of urban wastes may for the moment be only marginally feasible, systems for reclaiming one or more components are widely used. The approach to resource recovery with the most immediate potential for reducing nonpoint pollution could be source separation. Source separation is the removal of recyclable

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materials from the waste stream prior to mixing with other discards. Materials most often source separated include newspaper, glass and cans from residential sources; white ledger paper and computer paper in office buildings; and corrugated material from commercial activities, particularly supermarkets.

The storage/collection activity is the phase with the highest potential for causing nonpoint pollution. At office buildings and commercial establishments, most storage of recyclable materials is provided within the building or inside closed containers. However, in the case of residential source separation, materials are stored inside the home and then placed outdoors, usually at the curb, for collection.

These materials have the potential of being wind-blown or disturbed by animals before they are collected. Source separation programs including newspapers usually require that they be bundled or placed in grocery bags for collection. Both approaches will usually prevent the papers from being blown. Glass and cans are often set out in separate cans similar to trash cans or they are stored in grocery bags.

The latter approach is quite susceptible to scattering caused by animals knocking the bags over in attempting to get at any remaining food. Programs that include the source separation of cans and glass should require that these materials be placed at the collection point in tightly covered containers in the same manner as mixed wastes.

Materials that are source separated by householders are usually collected using the normal refuse collection vehicles or other types of truck. When the refuse collection vehicles are used, the separation materials are usually placed in bins or racks that are mounted under the normal collection body. This collection is accomplished simultaneously with the mixed waste collection system.

Where this rack approach is used, the racks should be securely fastened to the vehicle and provided with a door or other cover so that the papers do not spill out and become wind-blown from the truck. Where separate vehicles are used for materials collection, they may have either closed or open bodies. It is strongly recommended that vehicles collecting paper have closed bodies or closed compartments for the newspaper. Glass and can collection is less susceptible to being wind-blown; however, a closed compartment for these materials is also recommended.

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POLLUTION SOURCE CONTROLS ON CONSTRUCTION SITES

Definition

Minimizing nonpoint source pollution from construction sites through good management and "housekeeping" techniques.

Purpose

To reduce the availability of construction-related pollutants which can contaminate runoff water and, where runoff contamination cannot be avoided, to retain pollutants and polluted water on the site insofar as possible.

Conditions Where Practice Applies

This practice applies to all construction projects. The level of planning and management necessary to control nonpoint source pollution adequately is dependent upon the size and complexity of the construction site.

Planning Considerations

Construction activities, by their nature, create many sources of potential pollutants which can contaminate runoff and thereby affect the quality of downstream receiving waters. Accelerated erosion and sedimentation caused by land-disturbing activities is one of the major pollution problems caused by construction. Control measures and practices to limit sediment pollution are specified in the final section of this chapter.

There are, however, many other potential pollutants associated with construction activities such as gasoline, oils, grease, paints, cements, and solvents, to name only a few. Even non-toxic materials such as paper and cardboard can be classified as potential pollutants when they are washed into streams and lakes in large quantities.

The best way to prevent nonpoint source pollution on construction sites is to use "good housekeeping" practices, which usually entails simply maintaining the site in a neat and orderly condition. Specific practices should be employed to retain runoff and to deal with toxic substances and materials. An overall plan for the control of nonpoint source pollution is advisable so that specific control measures can be spelled out and implemented in an effective manner.

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Following are some specific elements which should be considered in nonpoint source pollution control planning on a construction site:

1) Erosion and Sediment Controls

Practices which minimize erosion and retain sediment on site are effective in controlling many other nonpoint source pollutants associated with construction activities as well. Development and impelementation of a good erosion and sediment control plan is a key factor in controlling nonpoint source pollutants other than sediment on a construction site.

2) Equipment Maintenance and Repair

Maintenance and repair of construction machinery and equipment should be confined to areas specifically designated for that purpose. Such designated areas should be located and designed so that oils, gasoline, grease, solvents and other potential pollutants cannot be washed directly into receiving streams or stormwater conveyance systems. These areas should be provided with adequate waste disposal receptacles for liquid as well as solid waste. Maintenance areas should be inspected and cleaned daily.

On a construction site where designated equipment maintenance areas are not feasible, exceptional care should be taken during each individual repair or maintenance operation to prevent potential pollutants from becoming available to be washed into streams or conveyance systems. Temporary waste disposal receptacles should be provided.

3) Storm Sewer Inlet Protection

Inlets to storm sewers should be protected by suitable filtering devices during construction to keep settleable pollutants from entering conveyance systems.

4) Waste Collection and Disposal

A plan should be formulated for the collection and disposal of waste materials on a construction site. Such a plan should designate locations for trash and waste receptacles and establish a special collection schedule. Methods for ultimate disposal of waste should be specified and carried out in accordance with applicable local and state health and safety regulations. Special provisions should be made for the collection and disposal of liquid wastes and toxic or hazardous materials.

Receptacles and other waste collection areas should be kept neat and orderly to the extent possible. Waste should not be allowed to overflow

its container or accumulate for excessively long periods of time. Trash collection points should be located where they will least likely be affected by concentrated stormwater runoff.

5) Washing Areas

Vehicles such as cement or dump trucks and other construction equipment should not be washed at locations where the runoff will flow directly into a watercourse or stormwater conveyance system. Special areas should be designated for washing vehicles. These areas should be located where the wash water will spread out and evaporate or infiltrate directly into the ground, or where the runoff can be collected in a temporary holding or seepage basin. Wash areas should have gravel or rock bases to minimize mud generation.

6) Storage of Construction Materials, Chemicals, Etc.

Sites where chemicals, cements, solvents, paints or other potential water pollutants are to be stored, should be isolated in areas where they will not cause runoff pollution.

Toxic chemicals and materials, such as pesticides, paints and acids, should be stored in accordance with manufacturers' guidelines. Groundwater resources should be protected from leaching by placing a plastic mat, packed clay, tar paper, or other impervious materials on any areas where toxic liquids are to be opened and stored.

7) Demolition Areas

Demolition projects usually generate large amounts of dust with significant concentrations of heavy metals and other toxic pollutants. Dust control techniques should be used to limit the transport of the airborne pollutants. However, water or slurry used to control dust should be retained on the site and not be allowed to run directly into watercourses or stormwater conveyance systems.

8) Sanitary Facilities

All construction sites should be provided with adequate sanitary facilities for workers in accordance with applicable health regulations.

9) Pest Control

Pesticides used during construction should be stored and used in accordance with manufacturers' guidelines. Overuse should be avoided and great care should be taken to prevent accidental spillage. Pesticide containers should never be washed in or near flowing streams

or stormwater conveyance systems. Further guidelines for pesticide use control are contained in other standards available in this section.

10) **Dust Control**

The use of calcium chloride, oils or other chemical dust control agents on construction roads should be avoided. Periodic watering of these areas is a preferred alternative.

SW BMP 2.05

STREET CLEANING

Definition

Urban street cleaning programs incorporating NPS pollutant control elements.

Purpose

To conduct urban street cleaning operations routinely in ways that will prevent street contaminants from becoming water pollutants. Accustomed benefits to aesthetics would continue, and could be enhanced.

Conditions Where Practice Applies

Most applicable for paved streets having curbs and gutters, but applicable to all paved vehicular traffic areas including parking lots, alleyways, driveways, etc.

This practice is particularly applicable to lower the pollutant load from existing built out areas where space for conventional structural treatment systems is simply not available or is extremely costly. The expected pollutant removal efficiency is highly variable. Most equipment will not remove the fine particulates where significant roadway pollutants abound. Consequently, whenever possible, even the most rigorous of programs (i.e., complete sweeping on a daily basis) should be used in conjunction with other measures to achieve a level of removal approaching the 80 to 90% range. Credit toward the normal treatment volume specified for a particular management practice will usually be given by the Department on a case by case basis.

Planning Considerations

The primary objective of municipal street cleaning practices has been to enhance the aesthetic appearance of streets by periodically removing accumulated litter, debris, dust, and dirt. Such practices, however, also have an impact upon the amount and type of roadway pollutants which may be washed into receiving waters during runoff events. Consequently, street cleaning is widely considered as a candidate management practice for reducing stormwater pollution loadings at its source.

As a basic principle: Any jurisdiction that has a street cleaning program will provide more protection to water quality than a jurisdiction that has

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no such program. It is necessary, however, that the program be compatible with the type of stormwater conveyance system in the locality.

For nonpoint source pollution control purposes, the conventional methods of street cleaning must be evaluated in terms of their pollutant removal effectiveness. Street cleaning operations directed primarily at litter control and aesthetic enhancement may have little effect upon important water pollutants such as BOD, pesticides, nutrients and heavy metals. Consideration of the water pollution factors may justifiably alter the choice of methods for cleaning the streets. At a minimum, such factors should always be considered in the conduct of street cleaning operations. At best, whenever choices exist at the outset in the setting up of new street cleaning programs, these factors should be a major consideration in planning the operation to be used.

The Pollutants

Streets are primary collectors of most types of urban pollutants. Besides the familiar bits of garbage, paper and plastic wrappings, the contaminants include food, animal wastes, grit and cinders, oil and grease, heavy metals, and other by-products of motor vehicle traffic, particles from industrial operations, air pollutants settled out or brought down in precipitation, fertilizer and pesticides from lawns and gardens. The variety and quantity of pollutants that accumulate on streets are directly related to the type and density of surrounding land uses, as well as, the use of the street itself.

Particle Size Implications

Research has shown that the majority of nutrient, oxygen-demanding and toxic substances reaching the streets are attached to fine particles. The main pollutant load therefore is contained in the dust and dirt fraction. For example, about 56% of the phosphates and 32% of the nitrates are associated with particle sizes of less than 43 microns. Fifty-one percent of all heavy metals and 73% of all pesticides are associated with particles less than 246 microns in size. The obvious conclusion to be drawn from these data is that street cleaning practices that can remove fine particles (less than 246 microns) will be the most effective for nonpoint source pollution control.

Cleaning Frequency

A regular periodic cleaning schedule is recommended. Logically, more frequent cleaning will result in greater pollutant removal. Each municipality must evaluate its own needs, conditions and costs to determine the best cleaning schedule.

Pollutant Location

The majority of particulate contaminants which are deposited on streets are

blown to the side by moving vehicles. It is estimated that 90% of street contaminants accumulate within 12 inches of the curbline of guttered streets. To a lesser extent, this concept has also been shown to apply to parking areas. Daily cleaning operations should concentrate on cleaning curb and gutter lines for maximum pollutant removal efficiency. However, in order to achieve high removal efficiencies the entire surface area of parking facilities must also be swept periodically; but this operation can be conducted on a less regular basis (weekly to bi-weekly).

Street Cleaning Alternatives

There are basically two alternative methods of street cleaning which are commonly used today. They are street sweeping and street flushing.

Street sweeping involves the use of machines which physically pick up contaminants from the street surface and deposit them in a self-contained bin or hopper. Street flushing on the other hand consists simply of moving contaminants by flowing water from the street to a stormwater conveyance system.

There are many variations of each type of system with differing applicabilities dependent upon local conditions and circumstances. Both of these street cleaning techniques are discussed in detail in the following sections.

Street Sweeping

The most common methods of street sweeping are mechanical (broom type) sweepers and vacuum sweepers.

Mechanical sweepers are the most commonly used and, understandably, the majority of the currently available performance literature deals with this type of sweeper. Mechanical sweepers basically consist of a gutter broom and a main broom which rotate at high speeds forcing the debris from the gutter broom and street surface into a conveyor belt and subsequently into a hopper. Water is usually sprayed on the surface for dust control.

The effectiveness of mechanical sweepers is recognized to be a function of a number of factors, including: (1) particle size distribution of accumulated surface contaminants; (2) sweeping frequency; (3) number of passes; (4) equipment speed; and (5) pavement conditions.

Most conventional mechanical sweepers are currently considered to be in the range of 50% effective for overall particle removal. However, their efficiency in the smaller particle range drops off dramatically. Table 6-1 illustrates the efficiency of typical mechanical sweepers with respect to particle size. Newer sweeper models may have greater removal efficiencies.

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The second type features vacuum action over the entire path, assisted by a gutter broom. Still, some of the particulates that are embedded in the road surface do not receive sufficient agitation to become air-suspended and, therefore, the vacuum is unable to draw them into the hopper.

A relatively new concept is the regenerative air system. Sweepers of this type force air down onto the pavement, suspending the particles, which are then picked up by the vacuum suction. These sweepers may be the most efficient in removing fines.

Some types of vacuum sweepers can serve another municipal maintenance function. If the unit is equipped with a wandering hose attachment, it can be used for sewer and catch basin cleaning. This type of sweeper would also be best suited for use on porous asphalt pavements which require deep particle removal to maintain porosity.

Besides equipment selection, there are other considerations which must be taken into account when developing an effective street sweeping program for nonpoint source pollution control. Some of these "fringe" considerations include:

1. Road surfaces: Smooth streets are easy to clean. Rough and broken surfaces are difficult--and may also contribute their own addition of asphalt and other materials to the burden. Roadways are typically raised in the center. Alleys may have the opposite configuration, making them difficult to clean with conventional, brush-type sweepers and requiring other devices.

2. Parking: Street sweeping will be effective only where no-parking regulations are effectively enforced. Public cooperation and awareness are essential. Even when parked cars are towed away, the cleaning operation is delayed pending towing. Some cities sweep downtown streets during rush hours when curbside parking is banned. Where curbside parking normally is permitted, adequate advance notice of sweeping and no-parking hours must be posted. To attempt to conduct street sweeping operations without strict enforcement of the ban is a waste of time, effort and money.

3. Operator Training: The most sophisticated equipment will be useless if badly run or maintained. Training for operators and maintenance personnel should stress the importance of their task as well as how to obtain maximum efficiency from the machines, including maximum removal of potential NPS pollutants.

Street Flushing

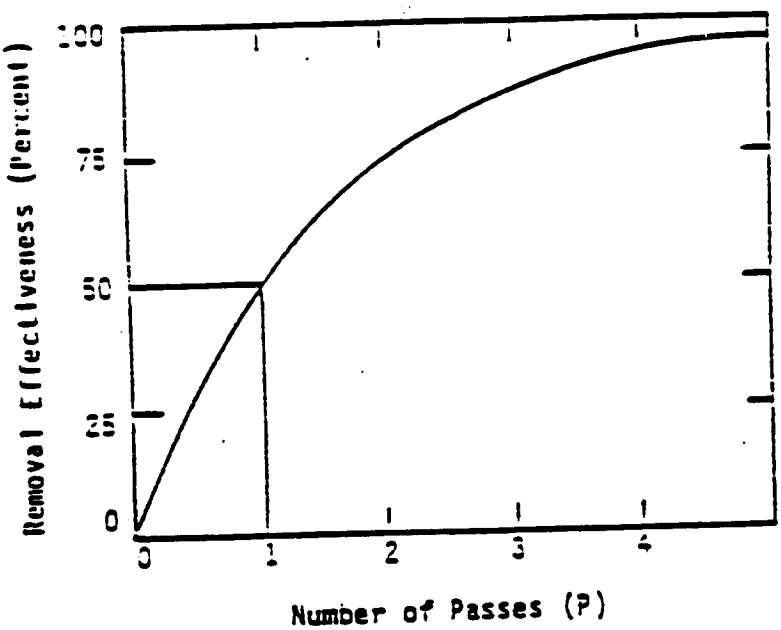
Street flushing is a practice which is employed in many cities as an alternative to or in addition to street sweeping. Street flushers typically consist of an 800- to 3500-gallon water supply tank mounted on a truck or

Table 6-1

RELATIONSHIP BETWEEN MECHANICAL SWEEPER EFFICIENCY AND PARTICLE SIZE

Particle Size (microns)	Sweeper Efficiency (% removal)
≥2,000	76
840-2,000	66
246-840	60
104-246	48
43-104	20
<43	15
Overall	50

Source: Areawide Assessment Procedures Manual, USEPA, July, 1976



REMOVAL EFFECTIVENESS WITH NUMBER OF PASSES FOR MECHANICAL SWEEPERS

FIGURE 6-1

Source: Water Quality Management Planning For Urban Runoff, USEPA, December, 1974

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trailer which is equipped to allow water to be sprayed through three or more directional nozzles onto the street surface. As currently practiced, street flushing does not pick up contaminants, but primarily serves to transport them from the center of the street surface to the gutter. The volume of water used is generally insufficient to transport the accumulated material to the nearest drain.

The efficiency of this type of street flushing can be improved, however, by using specially designed flushing equipment with high-pressure spray nozzles. A comparison of curves shown in Figure 6-2 indicates that a flusher of this type is a superior method of moving street contaminants. Conventional street flushers, however, are not likely to be as effective as this specially designed unit.

The applicability of any type of street flushing program for NPS pollution control is primarily dependent upon what happens to the flush water when it leaves the street. The relocation of pollutants from street surfaces to sewers helps ensure that they will be washed into receiving waters during the next runoff event. The practice must be accompanied by a means of recovering the polluted flush water or transporting it to a treatment facility or holding basin for later treatment. Combined sewer systems can provide this capability. Systems with separate storm sewer cannot.

Thus it must be noted that using a street flusher can do more harm than good with the latter systems. The storm sewers will simply transport the flushed pollutants--untreated and probably in more concentrated doses than otherwise--direct to receiving streams. In general only older localities in Florida have combined sewers. Street flushing should not be done in areas where there are separate storm sewers and sanitary sewers.

The practice of street flushing is most applicable in areas with combined sewers which can accommodate the flush water during periods of dry weather flow. Such an application must also be accompanied by sewer flushing, however, to insure that the pollutants don't just accumulate in the sewer system for later transport to receiving waters.

Flushing may also be applicable to smaller paved areas such as parking lots where the flush water can be collected in holding basins or cisterns before release. Much of the pollutant load can be removed through sedimentation or percolation in the detention or retention facility.

Maintenance

The primary maintenance consideration of street cleaning programs concerns the equipment. As with many other municipal services, the effectiveness of the program is highly dependent upon the operating efficiency of the equipment used. Whether street sweepers or street flushers are involved, they should be adequately maintained to insure economical and effective operation.

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Note: Surface Asphalt Initial Mass: 20 gm/sq. ft.

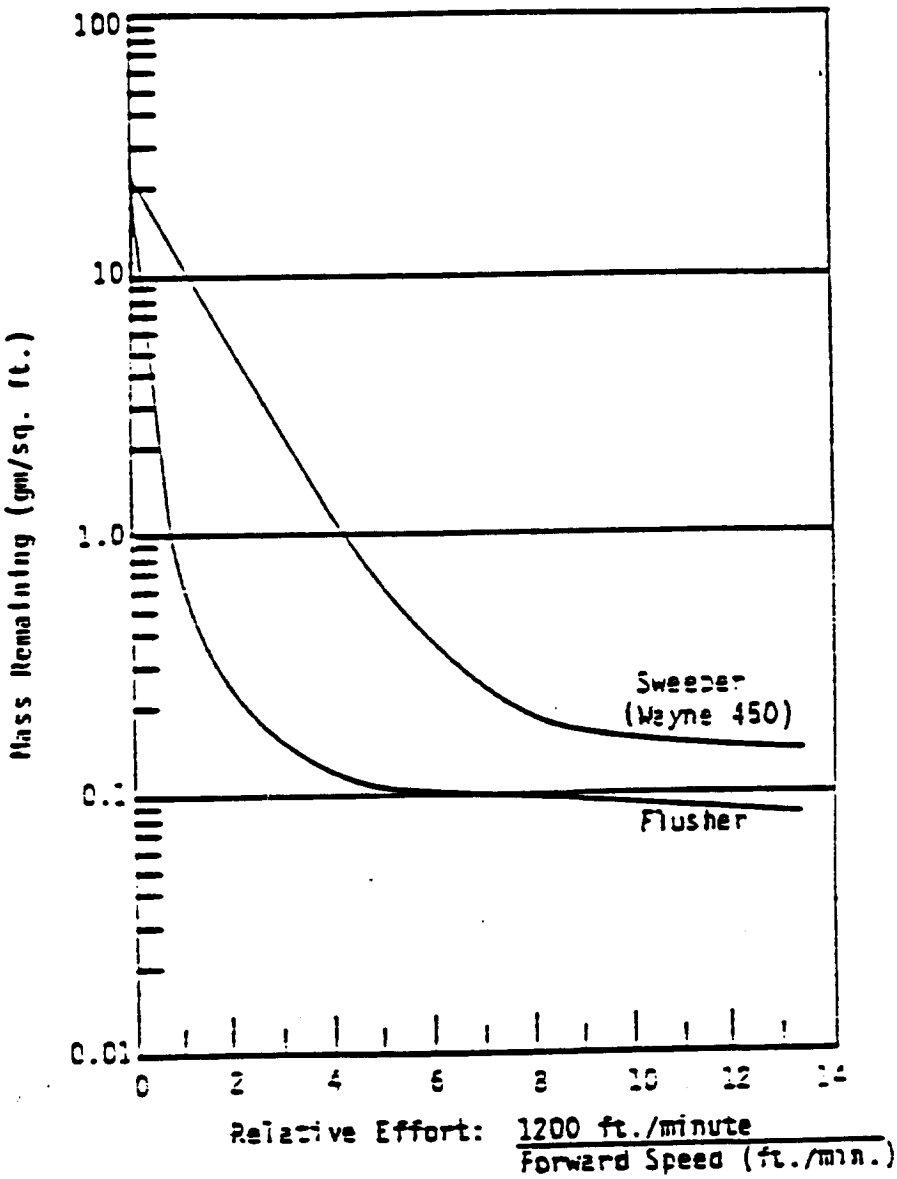

FIGURE 6-2
POLLUTANT REMOVAL COMPARISON:
SWEEPER vs. FLUSHER

Source: Water Quality Management Planning for Urban Runoff, USEPA, December 1974

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GUIDELINES FOR USING

STRUCTURAL STORMWATER CONTROLS

SW BMP 3.01

CONCRETE GRID AND MODULAR PAVEMENT

Definition

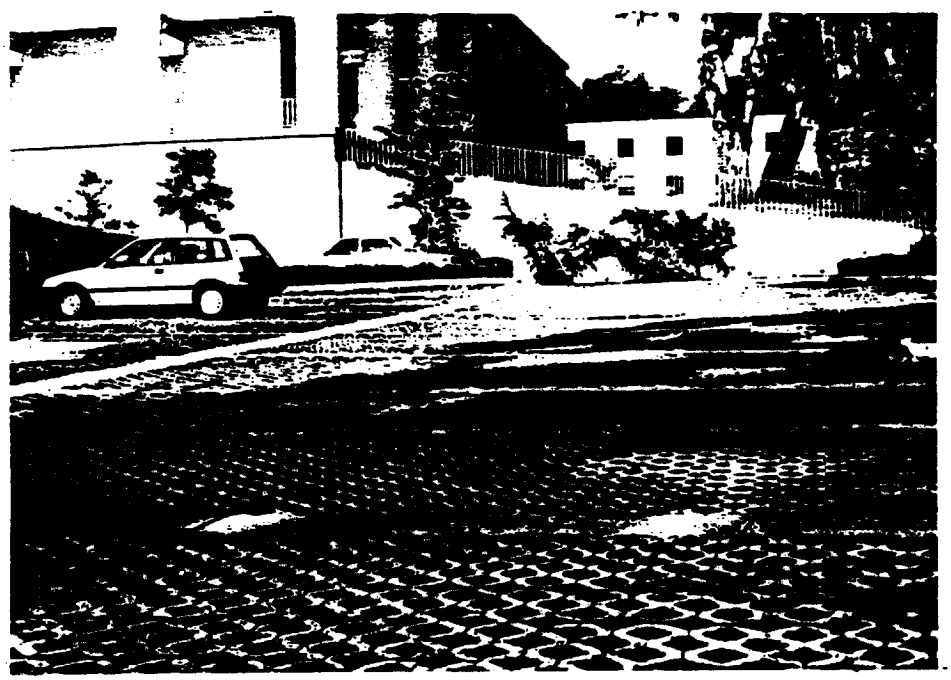
A pavement consisting of strong structural materials having regularly interspersed void areas which are filled with pervious materials, such as sod, gravel or sand.

Purpose

To reduce water pollution from low-volume traffic areas by providing a bearing surface having adequate strength to accommodate vehicles while allowing infiltration of surface water and filtration of pollutants. The approach is intended to achieve this purpose by:

1. Reducing the volume and peak rate of runoff flow, thus reducing the likelihood of sewer overflows, flooding, and downstream erosion and sediment pollution.

2. Reducing the loading and concentration of pollutants in the runoff.



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Conditions Where Practice Applies

Where pavement is desirable or required for low-volume traffic areas and the underlying soils allow for rapid drainage. This practice is most applicable for new construction, but it can be used in existing developments to expand a parking area or even to replace existing pavement if that is a cost-effective measure. This practice should NOT be used in areas where infiltrated pollutants may reach and degrade groundwater to below state standards.

Possible areas for use of these paving materials include:

1. Parking lots, especially fringe or overflow parking areas.

2. Parking aprons, taxiways, blast pads, and runway shoulders at airports (heavier loads may demand the use of reinforced grid systems).

3. Emergency stopping and parking lanes and vehicle cross-overs on divided highways.

4. On-street parking aprons in residential neighborhoods.

5. Recreational vehicle camping area parking pads.

6. Private roads, easement service roads and fire lanes.

7. Industrial storage yards and loading zones (heavier loads may demand the use of reinforced grid systems).

8. Driveways for residential and light commercial use.

9. Bike paths, walkways, patios and swimming pool aprons.

Planning Considerations

Pavement Types (See Figure 6-3)

Pervious pavement systems vary considerably in configuration. Categories include:

1. **Poured-in-Place Concrete Slabs** -- Reinforced concrete slabs covering large areas are poured in place on the ground to be covered. Special forms are used to shape the void areas, and a flat surface results. Because the slab is continually reinforced with steel, this pavement is suitable for heavy loads and has maximum resistance to movement caused by frost heave or settling.

2. **Pre-Cast Concrete Grids** -- Concrete paving units incorporating void areas are usually precast in a concrete products plant and trucked to a job site for placement on the ground. However, for large jobs these units can be formed and cast at the site. There are two types of grid pavers:

   a. **Lattice Pavers** -- generally flat and grid-like in surface configuration.

   b. **Castellated Pavers** -- distinguished by a more complex surface configuration characterized by crenels and merlons that are exposed when pervious materials are added. These units show a higher percentage of grass surface.

3. **Modular Unit Pavers** -- Smaller pavers which may be clay bricks, granite sets, or cast concrete of various shapes. These pavers are monolithic units which do not have void areas incorporated into their configuration. They are installed on the ground to be covered with pervious material placed in the gaps between the units.

Production of Units

There are a number of manufacturers of precast concrete grids and unit pavers, and various styles can be purchased from distributors. Forms are required for poured-in-place systems. These systems should be installed by contractors who have been trained in the use of the forms.

Site Characteristics

To determine the suitability of the types of paving materials and to plan and design their installation, the following information about the site should be known:

1. **Environmental data:** Soil permeability and bearing capacity; slope; depth, direction of movement, natural quality, and confined or unconfined condition of groundwater; and surface drainage conditions.

2. **Pollution information:** Types of pollutants generated by the prevailing and intended land uses and the effect of the practice on pollutants, generally and specifically. Pollution control effectiveness is not currently documented for these products, but research into these factors is in progress and results are expected to be forthcoming.

3. **The intended use of the area:** This is a key determinant of the choice of paving material. Is the installation temporary or permanent? What type of maintenance will be necessary? Is pavement coloring desired? What type of performance will be required of the paving surface? Can the practice be coupled with other BMPs for increased effectiveness?

4. Pre-development and projected post-development runoff determinations and other hydrologic data: To determine the need for overflow or back-up stormwater facilities, when required by local agencies for flood control. Few manufacturers list runoff or infiltration coefficients for their products, but research on these factors is in process.

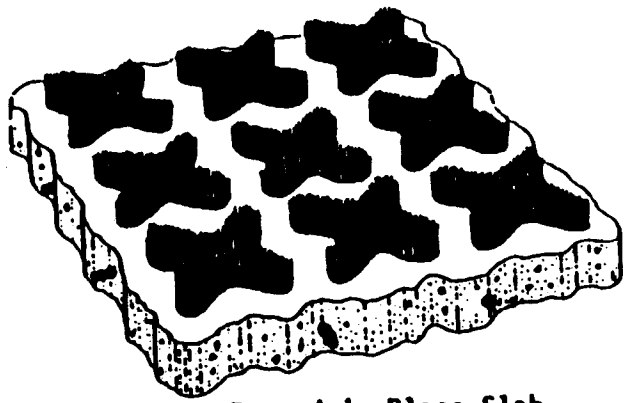
Design Criteria and Construction Specifications

All installations of pervious pavement should be designed and constructed according to the manufacturer's specifications. To be consistent with other forms of treatment, these systems must be capable of percolating at least 80% of the 3 year-1 hour design storm over a 1 hour period. Alternately, if these systems are designed such that they can provide a storage volume for the first half inch of runoff above the soil surface and including the subgrade base (if applicable) they may also be considered to provide 80-90% pollutant removal. Stored water must be percolated prior to the time limit specified for other onsite retention systems (72 hours). However, facilities using vegetative cover in combination with pavers must be capable of disposing of stored waters within time limits necessary to avoid damage to the ground cover (24 to 36 hours for most grasses). Parking areas should avoid extensive ponding for periods exceeding more than an hour or two.

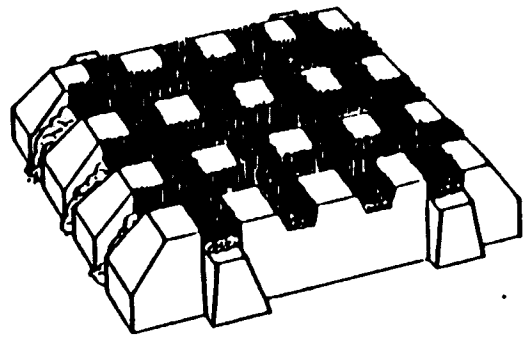
In the design of these systems experience shows a definite potential for large margins of error involved in estimating the infiltration rate of the underlying soils for the purpose of evaluating the storage recovery period to compare with the Department's requirements. Consequently the use of a safety factor of two or more is normally recommended. This allowance may be accomplished by reducing the percolation rate by one-half its original value or by limiting the drawdown period to half the allowable 72-hour value. Stormwater facilities as discussed in the Porous Pavement (SW BMP 3.06) may also be incorporated into these facilities to improve storage.

Maintenance

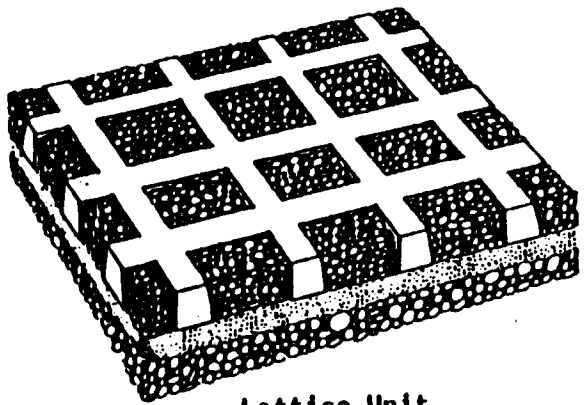
Where turf is incorporated into these installations, normal turf maintenance -- watering, fertilizing and mowing -- will be necessary. Mowing is seldom required in areas of frequent traffic. It is documented that the hard surfaces in these installations require very little maintenance. However, fertilizers, pesticides and other chemicals may have adverse effects on concrete products. The use of such chemicals should be restricted as much as possible.



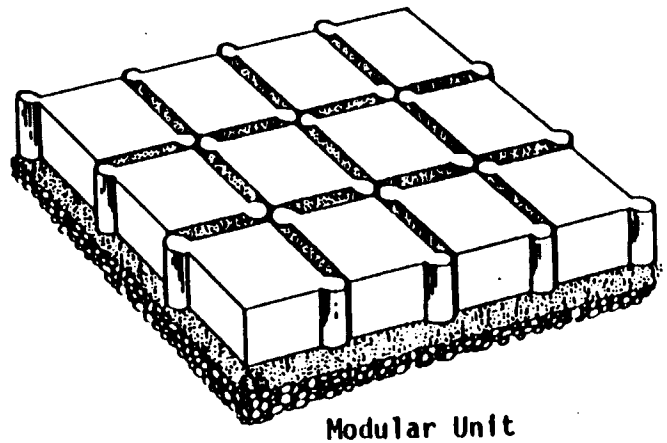
Poured-in-Place Slab



Castellated Unit



Lattice Unit



Modular Unit

FIGURE 6-3

TYPES OF GRID AND MODULAR PAVEMENTS

Source: Virginia Soil and Water Conservation Commission

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SW BMP 3.02

STORMWATER DETENTION BASINS

Definition

On-site detention refers to the temporary storage of excess runoff on the site prior to its' gradual release after the peak of the storm inflow has passed. Runoff is held for a short period of time and is slowly released to a natural or man-made water course, usually at a rate no greater than the predevelopment peak discharge rate.

Purpose

The objective of a detention facility is to regulate the runoff from a given rainfall event and to control discharge rates to reduce the impact on downstream stormwater systems, either natural or manmade. Generally, detention facilities will not reduce the total volume of runoff, but will redistribute the rate of runoff over a period of time by providing temporary "live" storage of a certain amount of stormwater. The volume of temporary "live" storage provided is the volume indicated by the area between the inflow and outflow hydrographs as shown in Figure 6-4.

A major benefit derived from properly designed and operated detention facilities is the reduction in downstream flooding problems. Other benefits include reduced costs of downstream stormwater conveyance facilities, reduction in pollution of receiving streams and enhancement of aesthetics within a development area by providing the core of "blue-green" areas for parks and recreation.

Example of a Typical Wet Detention Basin for Stormwater Control



(Source: Photo courtesy of Mr. Will Miller, Aurora Inc. South)

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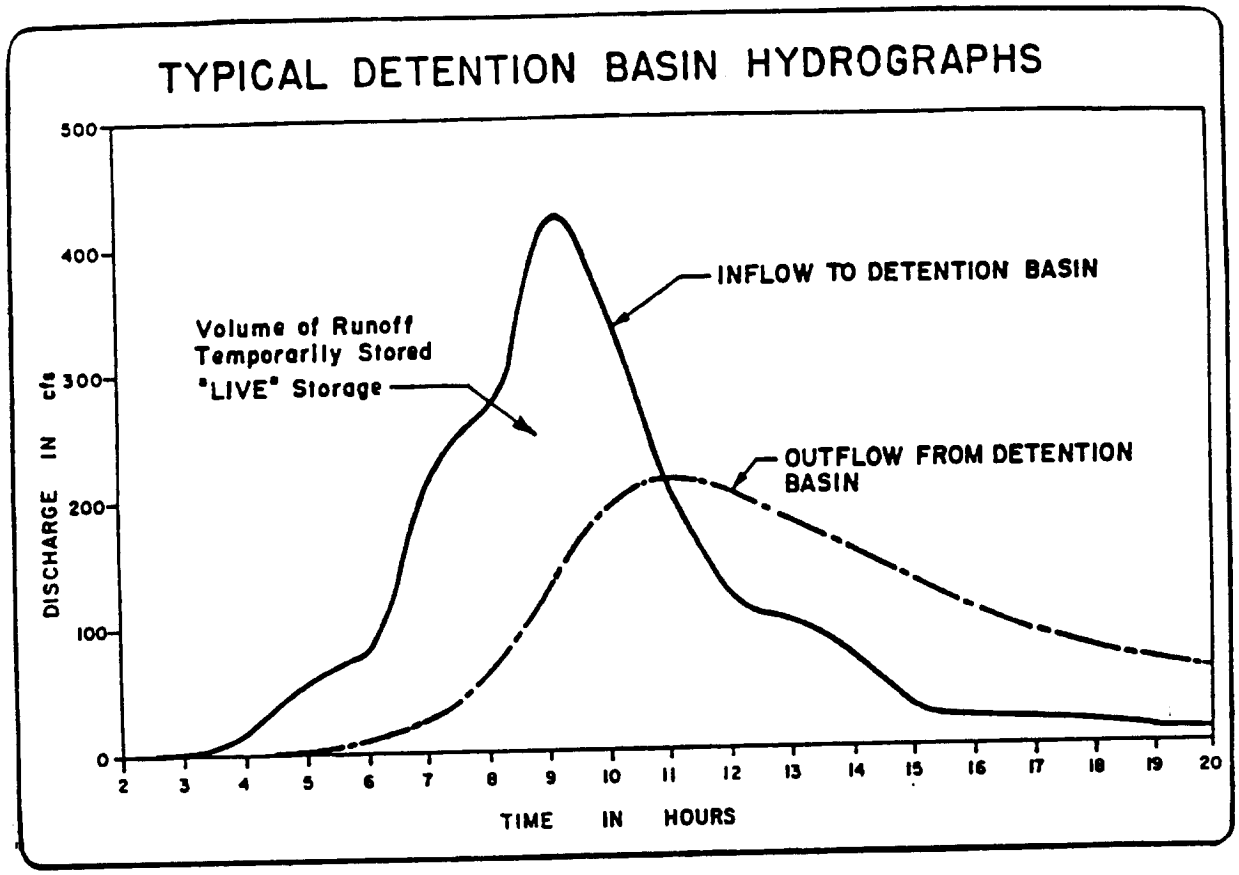
Figure 6-4



Planning Considerations

Throughout the design process the designer should be committed to considering the potential impacts of the completed facility. Such impacts can be positive or negative and can be as broadly classified as social, economic, political and environmental. Designers can often influence the positive or negative aspects of these impacts by their careful evaluation of decisions made in the design process. Generally speaking, the completed facility should provide for safety to people as well as protection of real property, water quality and wildlife habitats.

Multiple Uses: Multi-purpose use of the facility and aesthetic enhancement of the general area should also be major considerations. Above all, the facility should function in such a manner as to be compatible with overall stormwater systems both upstream and downstream to promote a watershed approach to providing stormwater management as well as local flood control.

R0071082

Water Quality Improvement: In planning new impoundments, it should be kept in mind that the goal of improved water quality downstream may conflict with certain desired uses of the impoundment. It is only logical that if the basin is used to remove pollutants, the water quality within the basin itself will be lowered, thus reducing the applicability for uses such as water supply, recreation and aesthetics. In planning the facility the engineer or planner should have a good knowledge of the runoff constituents and an understanding of the possible effects on the quality of the stored water.

Depending upon the impoundment design, downstream water quality may be improved for the following reasons:

1) Soil, sediment and other particulate pollutants settle out and are trapped to a degree.

2) Delayed release of runoff stretches out the loading to the receiving stream of runoff-borne sediment, organic materials, chemicals and bacteria thus reducing the "first-flush" or shock loading effects of stormwater effluent.

3) To some extent increased infiltration of runoff through the soil may occur so that the water is cleansed before reaching lakes, canals, or streams and the augmented groundwater volume later helps to sustain base flow.

4) Decreased runoff rates reduce stream channel erosion and subsequent sediment pollution.

5) Some amount of chemical transformation and biological uptake occurs which helps upgrade runoff quality while the water is detained in the detention pond. This upgrading process can be further enhanced through mechanical aeration and the use of aquatic plant species which can assimilate pollutants.

6) Downstream pollution by litter and debris is reduced to the extent that such pollutants are trapped within the impoundment area or pretreatment devices.

The exact level of treatment or pollutant removal which may be obtained from each or all of these mechanisms is difficult to predict. The efficiency of these systems has been shown to vary depending on a number of factors including the holding time, amount of littoral zone available, and the location of the inlet relative to the outlet of the facility, and the incorporation of other BMPs into an overall treatment train. Detention systems should be integrated with other BMPs such as swales, modified stormsewer inlets, etc. to reduce loading to the detention pond, especially if it will serve as an aesthetically pleasing "lake".

Stormwater detention impoundments can vary greatly in size and design. Until recently, the "dry pond" was often used. These structures impound water only during a storm and are designed to completely drain at an allowable release rate usually equivalent to predevelopment conditions. The primary purpose is to limit the peak rate of discharge. The entire storage volume is discharged within a matter of a few hours following an event. Consequently, in most instances little if any improvement (0% - 30%) in the quality of the water is likely to occur.

"Wet ponds" have been shown to function better for pollutant removal. Therefore, the information provided here is primarily associated with this type of installation. Such facilities are used extensively over much of south Florida and in low lying areas especially along the coast. These impoundments have a "normal water level" with additional capacity above the control elevation for runoff storage during storms. The structures are often designed with multiple uses in mind such as recreation, aesthetics, etc. Recent studies conducted in Florida as well as information collected during the National Urban Runoff Program (US EPA, 1982) demonstrate that these facilities are capable of providing a high level of pollutant abatement (80% or greater) for many constituents particularly nutrients.

Watershed-Wide Planning: The design of urban impoundments should be coordinated with a watershed-wide plan for managing stormwater runoff. In a localized situation an individual property owner can, of course, by his or her actions alone provide effective assistance to the next owner downstream if no other areas are contributing to that owner's problems. However, uncontrolled proliferation of impoundments within a watershed can severely alter natural flow conditions, causing compounded flow peaks or increased flow duration which can contribute to downstream degradation. In addition, upstream impacts due to future land use changes should be considered when designing the structure. Land use planning and regulation may be necessary to preserve the intended function of the impoundment.

Sediment and Debris: More often than not, detention ponds are expected to serve primarily as sedimentation basins during construction when erosion rates are particularly high. In and of itself this situation does not present a problem. Unfortunately, these facilities are often installed without the benefit of the designer having evaluated the capacity of either the initial or the final (post-construction) design configuration to perform this type of function.

In settlability analysis, removal by gravity settling is viewed to occur when the average velocity of flow through the pond is less than the settling velocity of the minimum size particles that the designer wishes to capture. Chemical flocculation, although expensive, can aid in this process as heavier sediments overtake and coalesce with the smaller

lighter fractions to form still larger particulates. Consequently, the opportunity for settling fine textured collodial material which happen to absorb and carry many other pollutants is projected to be enhanced as the average velocity decreases and the residence time and depth of the pond increases.

If a facility is to be used as the principal means to avoid having excessive levels of turbidity discharged from the site during construction, the engineer should evaluate the pond geometry in conjunction with the rate of outflow and grain size distribution of the soils. The application of a set of standards and specifications pertinent for flood control or even post construction water quality management can not necessarily be depended on to prevent excessive sediment delivery down stream. Adherence to typical predevelopment rate control criteria does not provide assurance that the average velocity of water moving through the detention basin will not exceed the settling velocity of the particulates that must be removed to avoid excessive levels of turbidity. Likewise, treatment schemes based on the control of small magnitude storms (i.e., one inch or less) as mandated by the statewide stormwater rule (17-25 F.A.C.) would not be expected to function properly since the major environmental damage that is likely to occur due to erosion and sedimentation would normally be associated with less frequent but greater magnitude storms (i.e., two inches or more in size). Consequently, a sizeable portion of major events that contribute to construction related problems would bypass the system practically untreated.

If a detention facility is to be used for sediment retention, the major objective should be to maximize sediment-trapping efficiency. One method of doing this is to maximize the hydraulic flow length within the basin. Long basins are generally more efficient than short wide ones, given equal depth.

Hydraulic flow length can be increased by installing a system of baffles within the basin which causes the flow to meander, allowing more time for sediment deposition to occur. See TEMPORARY SEDIMENT BASIN, (ES BMP 1.26) Appendix 1.26A, for recommendations pertaining to basins and baffles to promote improved sedimentation.

Marsh Establishment: Establishment of fresh water marshes in ponds can aid in water quality improvement. Marsh areas create a sink for many pollutants with a high degree of water treatment or purification possible, depending upon the runoff detention time and the availability of wetland plants and aquatic life which can assimilate pollutants.

Wetland associated plants will establish themselves naturally in a shallow, wet pond. It may be beneficial, however, to accelerate marsh establishment by planting appropriate native vegetation in shallow areas. Certain wetland plant species have a greater capacity for pollutant assimilation and are less maintenance intensive than others. The Center for Wetlands at the University of Florida, can help in the selection of appropriate species

for the specific site conditions. The Nonpoint Source Management Section of the Department, the local FDER district office, or the regional Water Management District may also be of assistance. These agencies are good sources for information concerning private consultants and nurseries that can also be of assistance in restoration or revegetation of aquatic systems.

Marsh establishment for stormwater treatment is still in the experimental stages in Florida. However, preliminary indications show that such measures can be appropriate for the following applications:

1) At the perimeter of deep impoundments to filter direct sheet flow runoff from the adjacent drainage area.

2) On shallow sills or shelves separating inline tandem ponds or forebays to filter runoff before it enters the major impoundment from tributaries or stormsewer inlets.

3) At the edge or surrounding the outflow of detention facilities to promote assimilation of dissolved pollutants before water exits the primary impoundment.

Marsh establishment in facilities that also serve as temporary sediment basins may be difficult during construction due to frequently required cleanout of accumulated sediment. To continue functioning, marshes will require periodic sediment removal. Sediment should be removed from the deepest parts of the basin where vegetation is sparse. Heavily vegetated areas should be disturbed as little as possible. Overhead scooping equipment works well for dredging selected portions of marsh areas.

The presence of marshes in established urban areas is perceived by many people to be undesirable. They are often thought of as mud holes where mosquitoes and other insects breed. Actually, once a marsh becomes fully established, it can become a welcomed addition to an urban community. Created fresh water marshes provide miniature wildlife refuges to which ducks, songbirds, turtles, raccoons, fish, and other wildlife have migrated. While insect populations are increased, insect predators also increase, often reducing the problem to a tolerable level.

Fresh water marshes can greatly increase the pollution removal efficiency of urban ponds. For this reason, vegetated littoral zones are a necessary part of any wet detention system.

Tandem Ponds and Forebays: The multiple-use purpose of certain impoundments may be preserved by installing a smaller settling basin directly upstream of the major basin. The smaller pond would serve to remove a large portion of the particulate pollution and release higher quality water into the major impoundments. The term "tandem pond" refers to a settling basin and adjacent detention or retention basin both resulting from constructed embankments. A "forebay" is an excavated settling basin at the head of the primary impoundment. The efficiency of the smaller settling basins can be

increased through the use of chemical flocculants which causes small colloidal particles to settle at a faster rate. See STORMWATER STORAGE/TREATMENT SYSTEMS (SW BMP 3.09), for more information.

Heavy Metal Contamination: Studies have shown high accumulation rates of lead, zinc and copper on and near heavily traveled highways and streets. Therefore, runoff from highways and streets can be expected to carry significant concentrations of these heavy metals. If a significant portion of the drainage area into a pond consists of highways, streets, or parking areas or other known sources of heavy metal contamination, there is a potential environmental health hazard. In such cases the multiple use functions of the pond should be limited and accessibility should be restricted.

The increased construction of multi-purpose impoundments with controls for nonpoint source pollution could mean the accumulation of sediment contaminated with heavy metals or other toxic materials. This may require special disposal sites for sediment dredged out of the basins during maintenance cleaning. However, investigators of sediments removed from detention ponds to date have found that the pollutants are tightly bound with only a slight possibility of leaching. To be safe, sediments to be removed should be analyzed and elutriate tests performed to verify that the sediment can be safely disposed of by conventional methods.

Design Criteria

In urban or urbanizing areas, failure of an impoundment structure can cause significant property damage and even loss of life. Such structures should be designed only by professional engineers who are qualified and experienced in impoundment design.

Wherever they exist, local safety standards for impoundment design and construction should be followed. Where no such criteria exist, widely recognized design criteria such as those used by the USDA Soil Conservation Service or U.S. Army Corps of Engineers are recommended. The following are intended to supplement other acceptable design and safety criteria only. They apply to pollution control purposes the adherence to which should not be construed to satisfy other design objectives.

Wet Detention Systems

Presently there are numerous sets of standards which have been promulgated with the intent to maximize the treatment (pollutant removal) capacity of permanently wet detention facilities. Guidelines have been developed by several of Florida's five water management districts as well as the Department of Environmental Regulation. All are somewhat different. However, most if not all permitting authorities seem to agree that a sizeable littoral zone should be provided to encourage better assimilation. Planting, preferably with native aquatic species, is usually recommended. Some degree

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of dimensional criteria pertaining to storage volume, depth, width, length, and the orientation of the inlet and outlet are also common. Designs which maximize residence time, encourage reaeration, and discourage short circuiting are principal goals.

The current guidelines established by the Department for wet detention systems follow, along with a list of available plant species that are encouraged. Each is still subject to changes. Research into the performance of these systems and the mechanisms by which they may best function is still in its infancy. Designers are reminded that these requirements may be slightly different in areas of the state where stormwater quality permitting has been delegated to the local Water Management District.

Current Department of Environmental Regulation Criteria for Wet Detention Systems are listed as follows:

a) One inch of runoff storage above the control (bleed down) elevation of the permanent pool.

b) This volume is to be recovered at a slow rate. No more than one-half the volume may be discharged in the first sixty hours following an event.

c) The volume in the permanent pool must provide for a residence time of at least fourteen days. This volume may be determined by estimating 3.83% of annual average runoff. A more empirical approach sometimes used is calculated by taking two inches times the impervious acreage in the project plus one-half inch times the pervious acres. The value in cubic feet is determined through multiplication times the appropriate conversion factor (i.e., 3630).

d) A littoral shelf should be provided by extending and gently sloping the sides of the facility (6:1 or flatter) out to a point 2-3 ft. below the normal water level or control elevation. Facilities that are planned with sides that are steeper than 4:1 out to a depth of two feet below the level of the permanent pool must be fenced to restrict public access for purposes of safety (Ref. 17-25.025(6) F.A.C.)

e) No more than 70% open water is recommended. The remaining 30% (i.e., littoral shelf) typically is established with aquatic vegetation. A layer of muck (6" recommended) may be incorporated into the littoral area to promote establishment of wetland vegetation. Planting of native aquatic plant species is highly recommended. Lining the bottom and sides of these facilities with a layer of organic material such as muck appears to be an attractive alternative when potential groundwater contamination problems are apparent. However, the use of muck that has been transported to the facility from areas where cattails or willows are predominant can cause nusiance weed problems and should be avoided.

f) A maximum depth of 8-10 feet below the invert of bleed down device should be planned for the permanent pool.

g) Inlet structures should be designed to dissipate the energy of water entering the pond. Baffles are the most commonly used structures for such purposes. Inlets should not be located in close proximity to the outlet so as to prevent short circuiting.

h) Facilities that are potential sources for oil and grease contamination must include a skimmer or other mechanism to prevent these substances from leaving the facility.

i) Erosion and sediment control BMP's must be used to retain sediment on site during construction. BMP's must be shown on the design plans and the engineer must provide instructions for proper O & M. Sod all areas above the normal water level of ponds to prevent erosion and sedimentation of plantings.

j) If the facility is planned as a "real estate" lake to enhance property values and promote the aesthetic value of the land, pretreatment in the form of landscape retention areas or perimeter swales should be incorporated into the stormwater management facility. If possible, catch basins should be located in grassed areas. By incorporating the "treatment train" concept into the over-all collection and conveyance system, the engineer can prolong the utility of these permanently wet installations and improve their appearance. Any amount of runoff waters, regardless how small, that is filtered or percolated along its' way to the final detention area can remove oil and grease, metals, and sediment; as well as, reduce the annual nutrient load to prevent the wet detention lake from eutrophying. A credit against the required wet detention storage volume may be provided depending upon the amount of stormwater infiltrated. A notice should be posted warning residents of potential water borne disease that may be associated with body contact recreation such as swimming in these facilities.

Littoral Zone Planting Criteria: Specific conditions for projects involving wet ponds with vegetated littoral zones are very similar to requirements pertaining to wetlands replacement and restoration. In each instance, monitoring in the form of photographic documentation of percentage survival of plant species and coverage of naturally occurring or propagated vegetation is usually requested. Submittals of this information will usually be on a quarterly basis for the first year. The frequency declines to once or twice a year during the next two year period.

Most permitting agencies will ask that the applicant remove nuisance species (e.g., cattails) during the establishment period. An 85% survivorship guarantee is usually required for all planted species. Annual replanting will be required if survival falls below the 85% level.

Whenever possible, the Department (FDER) encourages the use of native vegetation for "aquascaping" around and within detention ponds. These

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species require less intensive maintenance and are not as likely to become a nuisance as some of the more notorious introduced varieties that are often used in Florida for nutrient assimilation and pollution control (e.g. water hyacinth). In the design of the planting it is important to consider the need for future access to high maintenance areas such as inflow and outflow structure and sediment sumps.

The following list of herbacious plants and trees and shrubs is intended to provide the reader with some background information pertaining to the various types of vegetation that may be acquired from nurseries for establishment in and along the shoreline of wet detention facilities. It is by no means an exhaustive list and other species may be used if more suitable. Most of the plants in the "trees and shrubs" category are primarily used for their wildlife enhancement value and for landscaping landward of in the zone of fluctuating water that is temporarily detained and stored above the normal pool elevation. The herbacious species shown have a wide range of growth habits and preferred environments. The table also provides an indication of pool and comments regarding other features of interest as well.

TABLE 6-2

NATIVE PLANT SPECIES SUITABLE
FOR LITTORAL ZONE PLANTINGS AND LANDSCAPING AROUND DETENTION PONDS

SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE *	FEATURES
	TREES SHRUBS AND PALMS		
Acer rubrum	Red maple	1-2	Medium sized tree specimen known for its' attractive brilliant red fall color.
Betula nigra	River birch	1	Medium sized tree. Known for its' attractive bark. Prefers moist soils. Is often planted in clumps.
Carpinus caroliniana	American hornbean "Blue Beech"	1	Medium sized tree with attractive bark, and interesting form.

* Planting Zones:
1) + 0.5 feet or more higher than the normal level of the permanent pool.

2) + 0.5 feet above to - 1.0 feet below normal pool.

3) - 1.0 feet to - 3.0 feet below the control elevation of the permanent pool.

4) - 3.0 feet to - 5.0 feet below normal water level.

SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Carya aquatica	Water hickory	1-2	Large specimen. Leaves are relatively large. Fall color (bright yellow).
Cephalanthus occidentalis	Buttonbush	1-2	Large shrub up to 3m. (9.8 ft) tall with white flowers resumbling buttons. Buttonbush has a scrubby appearance owing to the dying of leader shoots leaving dead stumps.
Clethra alnifolia	Sweet pepper bush	2	Highlighter, shrub with attractive berries.
Crataegus spp.	Haw apple	1	Small tree with white flowers and attractive red fruit.
Fraxinus caroliniana	Popash	1-2	Large specimen with attractive foliage and deep furrowed bark.
Gordonia lasianthus	Loblolly bay	1-2	Medium to large tree. Large white flowers and attractive foliage.
Hypericum spp.	St. Johns Wort	2	Highlighter, shrub.
Ilex cassine	Dahoon holly	1	Small tree or shrub with prominent red berries and attractive evergreen foliage.
Ilex vomitoria	Yaupon	1	General landscape shrub with attractive red berries.
Illicium floridanum	Florida anise	1	Shrub with attractive aromatic foliage and purple flowers.
Liquidambar styraciflua	Sweetgum	1-2	Medium to large specimen. Attractive unusual shaped foliage and good fall color. Not tolerant of long term inundation
Liriodendron tulipifera	Yellow poplar "Tuliptree"	1	Large specimen; attractive large showy flowers and unusual shaped foliage.

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SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Magnolia virginiana	Sweet bay	1	Medium sized tree with attractive foliage and white flowers.
Myrica cerifera	Wax myrtle	1	Large shrub with attractive aromatic evergreen foliage. Bluish green berries in autumn and winter are eaten by many birds. Often used in groups for general landscaping and highlighting or accent around ponds.
Nyssa biflora	Blackgum tupelo	1-2	Glossy foliage turning bright red in autumn. Fruit matures in the fall; is consumed by many birds. Flowers are a source for honey.
Ostrya virginiana	Hop hornbean "ironwood"	1	Slow growing small tree with fruit clusters resembling "beer" hops. Trunk looks like sinewy muscle. Nutlets and buds are eaten by wildlife.
Persea palustris	Swamp redbay	1-2	Attractive aromatic glossy evergreen foliage. Bitter fruit is eaten by wildlife. Does not do well in submerged locations.
Quercus laurifolia	Laurel oak	1	Large tree with attractive nearly evergreen foliage. Acorns eaten by wildlife.
Quercus nigra	Water oak	1	Large deciduous tree with small fine textured foliage. Acorns provide food for wildlife.
Rhapidophyllum hystrix	Needle palm	1	Small to medium sized palm with attractive foliage used for providing tropical highlights. Sharp needles along the trunk lead to its' name.
Sabal palmetto	Cabbage palm	1	Large palm suited to all areas. Attractive tropical fan shaped foliage.

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SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Taxodium spp.	Cypress "Bald" or "Pond"	1-2	Large aquatic deciduous conifer of picturesque form. Preliminary observation shows good survival and rapid growth of either species when used for storm-water enhancement purposes.

FRESHWATER AQUATIC PLANT SPECIES
(Herbs, Sedges, Grasses and Ferns)

Bacopa caroliniana	Lemon bacopa "Water hyssops"	2	Crushed leaves and stems lemon scented. Flowers blue.
Canna flaccida	Golden canna "Canna lily"	2	Very good highlighter. Used at fringe of ponds and lakes. Large showy yellow flowers.
Cladium jamaicense	Saw-grass	1-2	Coarse perennial sedge up to 3m (9.8 ft) tall. Grows equally well in water or several feet above water level. Long narrow and serrated leaf blades. Provides nesting, protection and food (seeds) for water fowl and other birds.
Coreopsis nudata	Tickseed	2	Short perennial herb with attractive "daisy shaped" lavender flowers. Prefers shallow water or wet soil at edge of ponds or lakes.
Crinum americanum	Swamp lily	2	Good highlighter at pond fringes. Showy white fragrant flowers. Stems usually less than waist high.

SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Cyperus odoratus	Umbrella sedge	1-2	Good accent plant usually grown in clumps at edge of ponds. Areas of fluctuating water provide good habitat but umbrella sedge can also survive in more upland areas. Its stems are usually less than 3 ft. tall with a conspicuous umbrella shaped foliage and brown seed head.
Diodia virginiana	Buttonweed	1-2	Wet soils along the border of ponds provides a good environment. Buttonweed is a relatively low growing perennial herb. Main branches are usually less than 8 dm (2.6 ft) long. Stems branch from the base and grow along the ground. Small white flowers are borne between the junction of the leaves and stem. Does not prefer submerged conditions.
Dryopteris ludoviciana	Southern shield "Leatherwood fern"	1-2	Suited to wet soils in the zone of fluctuation above the permanent pool of detention ponds.
Echinochloa crusgalli	Barnyard grass "wild millet"	1-2	Predominately suited to the margins of ponds and lakes. A common annual with stems up to 1.2 m (3.9 ft.) tall. Seeds are heavily used by waterfowl and songbirds.
Eleocharis spp.	Spikerushes	2	Suitable for establishing marshes along the coast. Slender, dwarf and water spikerushes may be submerged. Other varieties grow along the landward edge of ponds. Green leafless stems vary in thickness from thread to pencil size and from ankle to shoulder high. May be grown in clumps or as colonies depending on species.

SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Eriocaulon decangulare	Hat pins	2	Hat pins are a low growing plant with slender spikes arising from the base. The top is tipped with a small white "button". Provides a pleasing contrast when mixed into areas dominated by wetland grasses or sedge.
Hibiscus spp.	Marsh hibiscus	1-2	Normally used for accent at the periphery of ponds. Stems are waist high or slightly higher. Large flowers, 4" to 8" in diameter, white or pink, sometimes with a red center.
Hydrocotyle umbellata	Water pennywort	2	Numerous round partly to deeply lobed leaves centrally attached to a stem up to 12 inches in length. Grows well on the surface of the water or as a ground cover rooted along the margin of ponds.
Hymenocallis spp.	Spider lilies	1-2	Provides good ground cover or may be used for accent at the edge of ponds. Showy white flowers. Best on wet soils. Average height 3 ft.
Iris Hexagona	Anglepod blue flag	2	Prefers wet soils at the fringes of lakes and ponds. The average height is about 1 ft. Used extensively as highlighters, planted in groups at the edges of wetland vegetation due to it's showy blue flowers.
Iris virginicus	Southern Blue Flag Iris	2	Prefers similar habitat to the "Anglepod" variety. However, this species is more upright in its growth habit. The flowers are larger and borne at the ends of each stem. Although very showy, either species of iris will only flower briefly for several weeks in spring.

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SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Nebumbo lutea	American lotus	3-4	This plant is an attractive large leafed rooted aquatic. The leaves are circular, up to 60 cm. (24 inches) across. The American lotus has very showy large yellow flowers. Dried seed pods are often used in flower arrangements. Similar to other "water-lilies", this species is planted along the outside of the littoral zone in groups spaced about 25 feet apart.
Nuphar luteum	Spatterdock	3-4	This "water-lily" has large oval or heart shaped leaves up to 40 cm (16 inches) long and 25 cm (10 inches) wide. Its flowers are small yellow and spherical shaped giving the appearance of a "bud" that hasn't completely opened. The rootstock provides spawning habitat for black crappie and shellcrackers in many of Floridas' artificial lakes and ponds.
Juncus effusus	Soft rush	2	Very attractive plant with pale green hollow stems up to 4 ft. tall. Commonly used in large clumps scattered along the edge of ponds or lakes. However, soft rush is also used in large concentrated groupings in ponds and covering the bottom of wet swales. The seeds are utilized by waterfowl.
Nymphaea mexicana	Yellow water lily	3-4	Similar in form and use as the other water lilies discussed previously. However, this species is distinguished by its attractive bright yellow flowers.

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SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Nymphaea odorata	Fragrant water lily	4	Along with Canna lily, Sagittaria, and Pickerelweed this species will produce flowers throughout the spring, summer and fall months. It is the most commonly utilized water-lily for "aquascaping" in urban impoundments. It has a sweet scented, white showy flower. Nymphaea is installed in clusters of three to five plants every 25 feet.
Nymphoides aquatica	Floating hearts	2-4	Very similar to other water lilies. A cluster of small white flowers reaches just out of the water. Short thick roots sometimes are found dangling from the stalk just under the leaf.
Osmunda cinnamomea	Cinnamon fern	2	Attractive lush foliage these plants are primarily suitable for use in shaded areas interm... to or approaching the periphery of cypress or other wooded wetlands.
Osmunda regalis	Regal fern	2	Similar in habit to the cinnamon variety where it is not already established this species may be used to add a "rain forest" like appearance to any deeply shaded area suitable for detaining run-off. Small depressions blended into a landscape such that the facility is over shadowed by large trees and tall buildings would represent one of the primary uses for either species in respect to stormwater enhancement purposes.

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SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Panicum hemitomon	Maidencane	1-2	This grass has narrow stems usually between .5 and 1.0m (1.6 - 3.3 ft.) tall. It may be grown in relatively dry soils or with the bases in a foot or two of water. Maidencane will form dense colonies in wet areas and in the shallows of ponds. This species supplies valuable cover and spawning habitat around its roots. Its aggressive growth habit tends to overshadow its valuable characteristics.
Peltandra virginica	Green arum "Arrow-arum"	2	This perennial herb has arrow shaped leaves up to waist-high. The blades vary in size up to a foot wide and one and a half feet long.
Polygonum spp.	Smartweed	2	Smartweed is an annual or perennial herb with creeping stems that run along the ground. Most types have small narrow lance shaped leaves. At the end of the stems are spikes of small pink and white flowers. The seeds are heavily used by birds, waterfowl and small mammals.
Pontederia cordata	Pickerelweed	3	Pickerelweed forms the core of most littoral zone enhancement efforts in Florida relative to wet stormwater detention ponds. It has attractive, dark green lance shaped leaves. Each stem produces a spike of numerous violet blue flowers that is quite showy.

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SCIENTIFIC NAME	COMMON NAME	PLANTING ZONE*	FEATURES
Sagittaria lancifolia	Arrowhead	3	Along with pickerelweed the "arrowheads" form the core of the mid-zone in most littoral shelf establishment efforts. Lancifolia has attractive narrow elliptical lance shaped leaves up to 2 ft. in length and 4 inches wide. It has small white flowers. Is not considered an important wildlife food source.
Sagittaria latifolia	Broadleaf arrowhead	3	This type of arrowhead is attractive with deeply lobed and arrow shaped leaves. They may be up to a foot long and slightly less wide. The species also has small white flowers extending above the leaves. Valued as a wildlife food source.
Scirpus californicus	Giant bulrush	2-3	Giant bulrush has blunt triangular stems up to 3m (9.8 ft.) tall. This sedge was introduced from California and is relatively common in Florida. It is similar in habit to "soft ste bulrush" but of larger stature.
Scirpus validus	Soft stem bulrush	2-3	The stems are cylindrical and may attain heights of 2.5m (8.2 ft.). Leaves are absent in bulrushes. Attractive brown spikelets are borne at the ends of the stem. The seeds are eaten by waterfowl and many marsh and songbirds. Soft stem bulrush will grow in mud or up to several feet of water.
Spartina bakeri	Sand cordgrass	1-2	This grass grows in stout rather large dense clumps up to several feet in diameter. It is quite suitable as an accent plant at the fringes of detention ponds in coastal areas. Cordgrass has long narrow wire like leaves. It's growth habit presents a thick fine textured broom like appearance. When flowering the plant has a reddish tinge at th- periphery.

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Nursery sources are recommended by the Department wherever possible. Small (2-4 inch) containers are encouraged to avoid transporting large amounts of potting soil to the pond. White roots and active basal budding indicate a healthy stock. Small pots seem to encourage active root growth when finally unconfined.

Most "aquascaping" specialists prefer to have someone on site during the construction phase to ensure that the littoral shelf is located and graded properly. Knowing exactly where the normal water level of the facility will reside after construction is absolutely essential to the success of this element of the system.

Bank erosion is often a significant problem during the initial stages of development. Stabilization with sod down to the normal pool and preventing undue sediment deposition is required for the planting to survive. There is no cheap way out. Costs typically run in the neighborhood of $2,000 - $10,000/acre. Therefore, it is important to do everything possible to ensure immediate success for both water quality and the sake of the client.

Storage Volume and Release Rate: Design of the storage volume and release rate of an impoundment depends upon the purpose for which the structure is built. Typical urban purposes which require different design strategies include flood control, stream channel erosion control, and consumptive uses (i.e., water supply, fire protection, irrigation, etc.). The purpose of pollution removal also requires a different design strategy. The following are some examples of typical design criteria for different impoundment purposes.

Flood Control: The design criteria for this purpose depends upon the level of flooding to be controlled. Usually, a locality will specify that stormwater runoff from a developing drainage area must be controlled so that the post-development peak runoff rate does not exceed the pre-development rate for a specific design storm. In some localities a ten year design storm is specified to protect downstream drainage structures. Other localities require protection from larger storms and specify that a fifty year or one hundred year storm must be detained and released at a reduced rate.

Stream Channel Erosion Control: In Florida, the criteria used to evaluate a stormwater discharge facility for this purpose is usually tied to the erosion potential of the area soils. The velocity associated with the peak rate of discharge expected from the design event (25 year/24 to 72-hour duration, typical) is compared to the maximum permissible rate (ft/sec), given the textural class of the substrate and a bare channel. Such information has been published by the Soil Conservation Service (USDA, S.C.S., 1974. pg. 4.18). Unless the local or regional permitting authority has established a lower set of limits, the maximum velocity allowed may be expected to range from 1.5 ft/sec for sands and sandy loam, to 2.0 ft/sec for sandy clay loam, and up to 2.5 ft/sec for clay.

Nonpoint Source Pollution Control: The primary design strategy for this purpose is to maximize the detention time of captured runoff. It is believed that basin drawdown times in excess of 60 to 120 hours will result in significant pollutant removal. However, the required storage volume is usually tied to the capture of the first, most pollutant laden, portion of a storm (i.e., the initial one inch of runoff).

Flow Routing: A stormwater detention basin acts as a constriction in the stream or conveyance system. A portion of the flow backs up and is temporarily stored. The procedure used to determine the volume of water which will be held behind the detention structure during a design rainfall event is known as flow or flood routing. In order to properly size a detention basin, a flow routing procedure must be used to determine the storage volume for a range of design storms given the maximum allowable release rate which is deemed to be necessary to satisfy the objective or objectives for which the structure is being designed.

Most flow routing procedures involve a trial and error process. The storage volume or outflow rate is varied depending on the desired depth, or space, and any number of other limitations. The basic premise is that the volume of runoff entering the detention basin minus the amount of water leaving over a given interval of time is equal to the required volume of storage. Consequently, flow routing can be extremely time consuming when done manually.

Rather than present a lengthy in-depth explanation or an over-simplified version of the subject of flood routing in this handbook, the reader is referred to the Soil Conservation Service, (SCS) National Engineering Handbook Section 4, Chapter 17. That reference provides a good explanation of flood routing for calculating detention storage volumes. The SCS TR-20 and DAMS 2 computer programs provide accurate methods of analysis. The Stormwater Management and Design Aid (SMADA) program developed for the Department by the University of Central Florida is also available on diskettes for use with IBM personal computers. These are just a few of the acceptable routing models recognized by regulatory authorities around the state.

Manual Method: A simpler, but less accurate method of estimating detention storage volume is the "Manual Method" outlined in SCS Technical Release No. 55, Chapter 6. It involves the use of a single graph which was developed based upon average storage and routing effects of many structures.

The primary advantage of this method is its simplicity and compatibility with SCS runoff calculation procedures described in Chapter 5 of this manual. It is particularly suited for small detention basin design, and estimating the required size of basins during the project planning phase.

A common application of the design procedure for the Manual Method is

presented here, however, its use is subject to the following limitations:

1) The drainage area must be less than 2000 acres.

2) Failure of the structure must not result in loss of life or major property damage.

3) The procedure should not be used to perform final design if an error in storage of 25% cannot be tolerated. The SCS design aid is biased to prevent undersizing of outflow devices, but it may significantly overestimate the required storage capacity. More detailed hydrograph development and routing will often pay for itself through reduced construction costs.

The following design procedure will only determine the required storage volume of the basin. The design of an appropriate discharge structure, which will maintain the allowable release rate at the design storage elevation, should also be done by a qualified engineer.

In Florida the discharge control structure for a detention pond intended to satisfy both water quantity and water quality objectives would be a two stage device. In most instances the first stage is regulated by a small orifice (usually round) that is designed to provide intended storage for treatment of the first inch of runoff from the contributing area. The water is released at a very slow rate. The required storage volume (Vs1) in cubic feet is determined by simply multiplying the drainage area (A) in acres times one inch of runoff (R) times the appropriate conversion factor (3630).

During the design process for flood routing the volume is viewed as static since its rate of release is so relatively slow. Moreover, this volume of storage is normally required in addition to that established for peak discharge control. Many local governments or water management districts responsible for flood control have determined that a sizeable portion of this storage could be taken up and therefore be rendered unavailable by smaller magnitude storms that may occur nearly daily during the period of the year when larger events approaching the design conditions for peak discharge control have the highest probability of occurring. Consequently, the most common application of these procedures is a two fold process. The storage volume for water quality control (Vs1) is first determined. Part two involves an estimate of the additional storage volume (Vs2) which must be provided to meet peak discharge limitations. The SCS manual method of flow routing described in TR-55 may be used for these purposes subject to the previously discussed limitations.

DESIGN PROCEDURE

Step 1 - Determine the storage volume (Vs1) to satisfy water quality control objectives.

Input Requirements and Procedures

The most frequent application is to estimate storage volume (Vs1) for situations where the drainage or contributory area is equal to the project area. The required inputs are the drainage area (A) in acres and the required "runoff" depth (R) to be stored as specified by the appropriate regulatory agency. This depth may range from a minimum of 0.5 inch to 1 inch or more depending on jurisdiction. The value Vs1 in cubic feet is calculated as follows:

Vs1 = A (ac) x R (in.) x 3630 (conversion factor acre inches to cubic feet)

Example:

A 75-acre medium to high density residential development is planned to discharge through a single outlet into an existing drainage canal designed for present land use conditions. No off-site drainage will be delivered by the project's conveyance system. How much storage (Vs1) will be required above the seasonal high water table elevation (10 ft NVGD) to meet the state's water quality treatment criteria? Assume that the project is required to provide for the first inch of runoff (R) stored above the level of the permanent pool. What is the invert elevation of the facility so as not to lower the existing water table? What is it's average size (square feet) assuming the depth of storage is limited to one foot?

The storage equation is:

$$Vs1 = AR\ (3630)$$

where:

A = Watershed Area (75 acres)
R = Runoff Treatment Depth Criteria (1 inch specified)

$$Vs1 = (75)\ (1)\ (3630) = 272{,}250 \text{ cu.ft.}$$

The facility's size may be determined since the maximum depth of the detained water is specified. Use the following equation:

$$a = Vs1/d$$

where:

a = average size of detention pond (square feet)

Vs1 = storage volume (272,250 cu.ft.)

d = depth of storage (1 ft. specified)

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therefore:

$$a = 272{,}250 \text{ ft}^2 \text{ or } 6.25 \text{ acres}$$

The invert elevation of the discharge control structure orifice must be set equal to or above the seasonal high water table elevation to avoid changing the existing conditions as specified. Therefore, the bottom of the bleed down orifice should be no lower than 10 feet NVGD as stated by the information given.

Step 2 - Determine the size of the device needed to limit the rate of drawdown for the first stage to satisfy state or local criteria.

Input Requirements and Procedures

In Florida, the most commonly used means of metering the first stage of detention facilities is accomplished by cutting or drilling one or more small round openings (i.e., orifices) at the appropriate elevation along the barrel of a riser pipe, through a weir, or through the face of a concrete box drop inlet spillway. The required inputs for estimating the size of the orifice required is average depth of storage or head (h) effecting the orifice during the drawdown period considered and the desired release rate. The storage volume Vs1 and the minimum drawdown time are usually required to determine the allowable rate of release.

The orifice equation is modified to solve for A (area of orifice) as follows:

$$Q = CdA(2gh)^{1/2}$$

$$A = \frac{Q}{Cd(2gh)^{1/2}}$$

where:

Q = rate of discharge (cfs)
A = orifice area (ft^2)
g = gravitational constant (32.2 ft/sec^2)
h = depth of water above the flow line (center) of orifice (ft)
Cd = orifice coefficient (usually assumed = .6)

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By setting "h" equal to the average depth between two stages and calculating the average rate of drawdown during the interval, the designer can calculate the orifice area required. The average rate of discharge is determined by dividing the volume of storage available between the intervals of elevation by the time period of concern in seconds. Using the existing state guidelines for these systems would stipulate that the device must limit outflow to no more than .5 Vs1 over the first 60 hours. This translates to a value of 2.315×10^{-6} Vs1 cfs as the controlling rate of discharge. The entire solution for the previous example is shown below.

Example:

Given the 75 acre residential project mentioned previously, what is the orifice area required to limit drawdown to one-half the storage volume over a sixty (60) hour period? Recall that the storage required to meet water quality criteria (i.e., Vs1) is equal to 272,250 cubic feet. Also recall that the depth of storage was specified to be one foot.

Rearrange the orifice equation and solve for (A)

$$A = \frac{Q}{Cd(2gh)^{1/2}}$$

Substitute the following values in the equation:

Cd = .6
A = orifice cross section area (ft^2)
g = 32.2 ft/sec^2
Q = 272,250 ft^3 (2.315×10^{-6}) = .63 cfs
h = $\frac{1.0 \text{ ft} + .5 \text{ ft}}{2}$ = .75 ft

(NOTE): This is the average depth of storage during the drawdown period where one-half the storage volume is presumed to be recovered.)

Therefore:

$$A = .63 \text{ cfs} / .6 \left[(2)(32.2 \text{ ft/sec}^2)(.75 \text{ ft})\right]^{1/2}$$

or;

A = .15 sq.ft.

To determine the diameter of a circular orifice rearrange the equation for the area of a circle and solve for D (diameter) as follows:

Eq. for area of a circle; $A = \frac{\pi D^2}{4}$

Rearrange and solve for D

$$D = (4A/\pi)^{1/2}$$

Substituting A = .15 sq.ft. from above,

$$D = [4(.15)/3.1416]^{.5} = .44 \text{ ft.}$$

Use a 5 inch diameter orifice

Step 3 - Use Figure 6-5 to estimate Vs, storage volume for peak discharge control.

Input requirements and procedures

Figure 6-5 may be used to estimate storage volume (Vs) required or peak outflow discharge (q_o). The most frequent application is to estimate Vs, for which the required inputs are runoff volume (V_r), q_o, and peak inflow discharge (q_i). To estimate q_o, the required inputs are Vr, Vs, and q_i.

Estimating V_s

To estimate the storage volume required, use the following procedure:

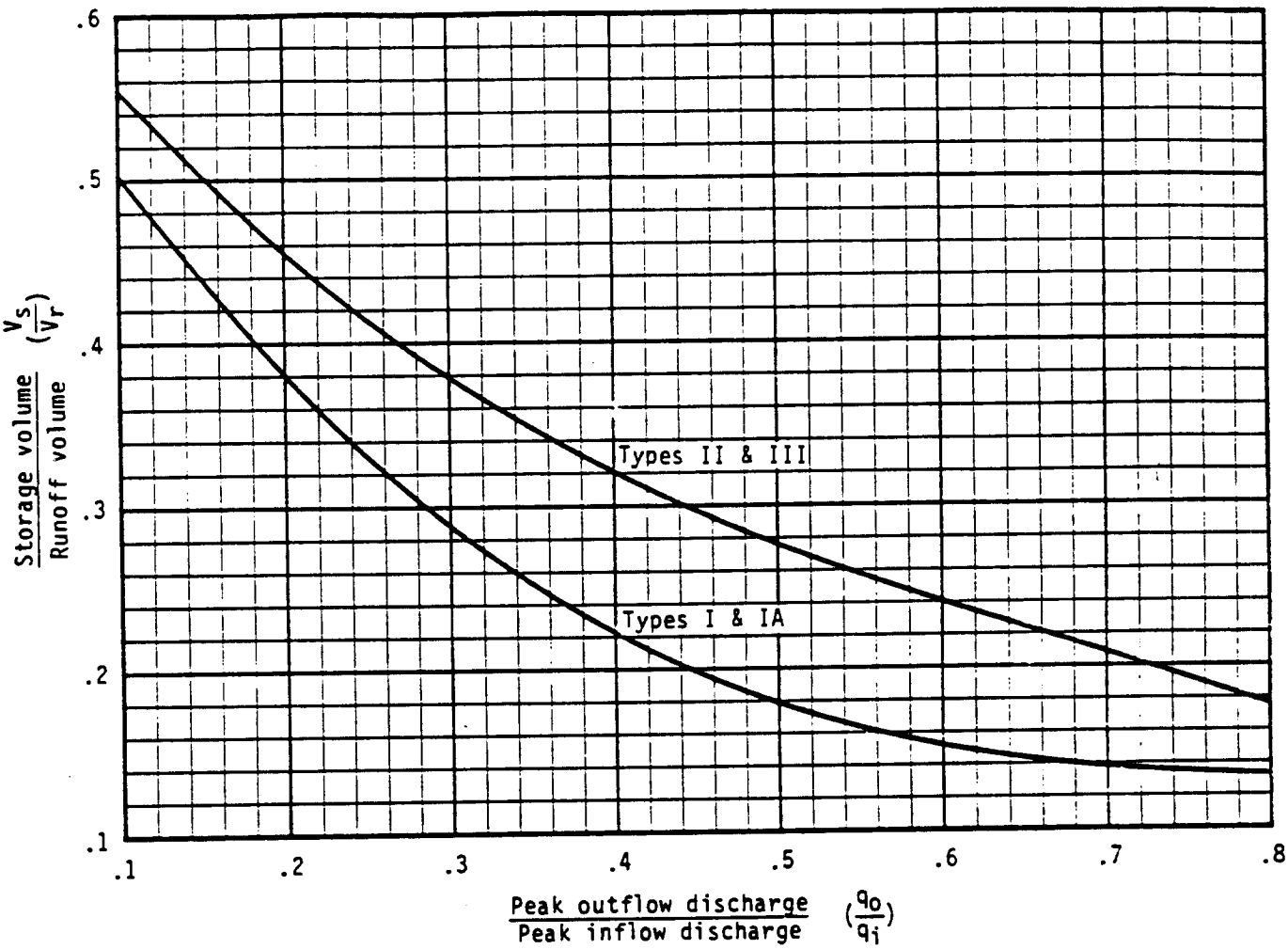
a) Determine q_o. Many factors may dictate the selection of peak outflow discharge. The most common is to limit downstream discharges to a desired level, such as predevelopment discharge. Another factor may be that the outflow device has already been selected.

b) Estimate q_i by procedures outlined in chapters 4 or 5 of TR-55, Second Edition published by SCS, June 1986. Do not use peak discharges developed by any other procedure. When using the Tabular Hydrograph method to estimate q_i for a subarea, only use peak discharge associated with $T_t = 0$.

c) Compute q_o/q_i and determine V_s/V_r from Figure 6-5.

FIGURE 6-5

APPROXIMATE DETENTION BASIN ROUTING FOR RAINFALL TYPES I, IA, II AND III



U.S.D.A. Soil Conservation Service, 210-VI-TR-55,
Second Ed., June 1986.

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d) Q (in inches) is determined when computing q_i in step b above. However it must be converted to the units in which V_s is to be expressed - most likely, acre-feet or cubic feet. To convert Q to V_r expressed in acre-feet:

$$V_r = .083\ Q(A)$$

where:

V_r = runoff volume (acre-feet),
Q = runoff (in),
A = drainage area (ac.) and
.083 = conversion factor from acre-inches to acre-feet.

e) Use the results of steps c and d to compute V_s:

$$V_s = V_r \frac{V_s}{V_r}$$

where V_s = storage volume required (acre-feet).

The stage in the detention basin corresponding to V_s for stage 1 plus stage 2 must be equal to the stage used to generate q_o.

Example

Going back to the situation mentioned earlier, recall that a 75-acre development is being planned that discharges into an existing channel designed for present conditions. Assume the watershed is in the type II storm distribution region. Suppose that the present channel capacity, 180 cfs, was established by computing discharge for the 25-year-frequency storm by the Graphical Peak Discharge method (Chapter 4 SCS, 210 VI - TR-55, Second Edition, June 1986.) Further presume that the developed-condition peak discharge (q_i) computed by the same method is 360 cfs, and runoff (Q) is 3.4 inches. Since outflow must be held to 180 cfs, a detention basin having the maximum outflow discharge (Q_o) will be built at the watershed outlet.

How much storage (V_s) will be required to meet the maximum outflow discharge (Q_o) of 180 cfs, and what will be the approximate dimensions of a rectangular weir outflow structure? Figure 6-6 shows how SCS TR-55 worksheet 6a is used to estimate required storage (V_s stage 2 = 5.9 acre-feet) and maximum stage (E_{max} = 12.0 feet).

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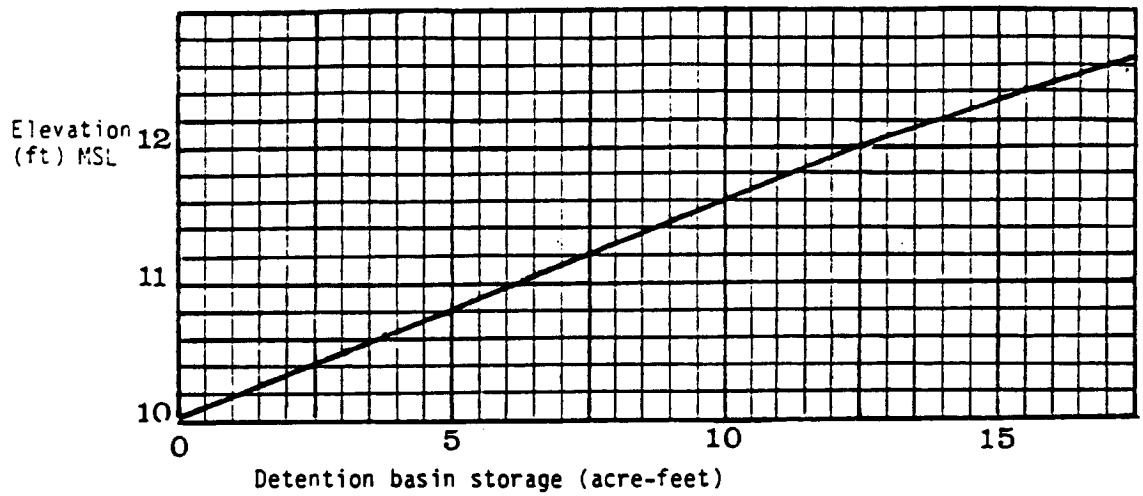
FIGURE 6-6

Worksheet: Detention basin storage above permanent pool, peak outflow discharge (q_o) known

Project Coastal Flatwoods Estates By JC Date 2/3/88

Location Canal County, Florida By EHL Date 2/5/88

Circle one: Present [Developed] ? - stage structure



1. Data:
   Drainage area ..... A = 75 ac.
   Rainfall distribution type (I, IA, II, III) = II

	1st stage	2nd stage
2. Frequency ..... yr	NA	25
3. Peak inflow discharge, q_i ... cfs From worksheet 4 or 5b	NA	360
4. Peak outflow discharge, q_o ... cfs 1/	.7	180
5. Compute $\frac{q_o}{q_i}$	NA	0.50
6. $\frac{V_s}{V_r}$ ..... (Use $\frac{q_o}{q_i}$ with figure 6-5)	NA	0.28
7. Runoff, Q ....in (From worksheet 2 TR-55)	NA	3.4
8. Runoff volume, V_r ....ac-ft (V_r = QA 0.083)	NA	21.1
	2/	3/
9. Individual storage volume,	6.25	5.9
10. Total storage volume, V_s ac.ft.	6.25	12.15
11. Maximum stage, E_{max} (From plot)	11.0	11.95

1/ 2nd stage q_o includes 1st stage q_o.

2/ Computed in the Step 2 Example

3/ $(V_s = V_r (\frac{V_s}{V_r})$

After USDA Soil Conservation Service Worksheet 6a.
(210-VI-TR-55, Second Edition, June 1986)

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The rectangular weir was chosen for its simplicity; however, several types of outlets can meet the outflow device proportion requirement. Most hydraulic references, along with considerable research data that are available, provide more guidance on variations of outlet devices than can be summarized here.

An outlet device should be proportioned to meet specific objectives. A weir is suitable here because of the low head. The weir crest elevation is 11.0 feet.

Figure 6-6 also shows how SCS TR-55 worksheet 6a may be slightly modified and used to record the storage volume (V_s) of 6.25 acre-ft and elevation ($E^{max.}$) of 11.0 ft. MSL for the first stage of the control structure. The invert or crest elevation of the second stage weir to be used for peak discharge control corresponds to the maximum storage elevation (11.0 ft. MSL) for the first stage device. Recall that these values were determined in the example for "Step-2" of this analysis.

The datum of the stage one control device is the center or flow line of the five-inch diameter circular orifice. Consequently, the invert or ultimate control elevation of the structure would be slightly (i.e., 2.5 inches) below the mean high groundwater elevation (10.0 ft. MSL). If this small deviation cannot be tolerated, the designer may still use the procedure to establish the minimum orifice required. Setting the invert elevation at datum when the structure is installed would not present a problem. While stage one would not optimize the allowable bleed down capacity, the structure would remain in compliance with state criteria since the end result would be a reduction in the actual rate of discharge and a concurrent increase in drawdown time.

The second stage is proportioned to discharge the correct amount at 12.0 ft. (Figure 6-6, step 11). However, the maximum allowable rate of discharge for the second stage equals the total discharge minus discharge through the first stage. Consequently, the designer must first compute the discharge through the first stage for elevation 12.0 ft. using the orifice equation.

$$Q = C_d A\ (2gh)^{1/2}$$

where:

Q = Discharge (cfs)
A = Orifice Cross-Sectional Area (ft^2)
g = Gravitational Constant (32.2 ft/sec^2)
h = Head over Orifice (ft.)
C_d = Orifice Discharge Coefficient
(.6 usually presumed)

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h and A are determined as follows:

$$h = E_{max} - \text{Flowline Elev. of Orifice}$$
$$= 12.0 - 10.0 = 2.0 \text{ ft.}$$

Since A was established equal to 0.15 sq.ft. during the "Step 2" analysis, the equation may be solved for Q

$$Q = .6\ (.15)\ (2 \times 32.2 \times 2)^{.5}$$
$$= 1.0 \text{ cfs}$$

As may be seen, in this instance the contribution associated the maximum allowable discharge (180 cfs) specified on the worksheet for the second stage device (Figure 6-6, step 4). In this instance the first stage can be ignored and the required weir crest length (Lw) for the second stage may be determined as though the control structure was a single stage device.

Using the total storage V_s = 12.15 acre-ft (Figure 6-6, step 10) and the elevation-storage curve, the maximum stage (E_{max}) is approximately 12.0 ft.

The rectangular weir equation is

$$q_o = 3.2\ L_w H_w^{1.5}$$

where:

q_o = peak outflow discharge (cfs),
L_w = weir crest length (ft, and
H_w = head over weir crest (ft).

H_w and q_o are computed as follows:

$$H_w = E_{max} - \text{weir crest elevation}$$
$$= 12.0 - 11.0 = 1.0 \text{ ft.}$$

Since q_o is known to be 180 cfs, solving the weir equation for L_w yields;

$$L_w = 3.2\ H_w 1.5$$

$$= \frac{180}{3.2\ (1.0)^{1.5}} = 56 \text{ ft.}$$

In summary, the outlet structure is a rectangular weir with crest length of 56 ft, H_w = 1.0 ft, and q_o = 180 cfs corresponding to a V_s = 12.15 acre-ft. of which 6.25 acre-ft. is associated with the stage one water quality criteria.

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If the width of the control structure (weir) exceeds either the physical capacity of the site or the owners pocket-book the designer may wish to increase the depth of storage (H) associated with stage one. In this example, an increase in the depth of the first stage to 1.5 ft. or elevation 11.5 MSL and a corresponding increase in H_w to slightly less than 3.0 ft. (E_{max} = 13.0 ft. MSL) would result in a sizeable reduction in crest length L_w = 30.6 ft. However, the designer should be aware that fluctuations in the design depth of stage one exceeding one foot can make the selection of plantings difficult and drastically influence the possibility of success in the establishment of a viable littoral zone. Recent reports seem to support the findings that nuisance species such as cattails and willows will out compete the preferred native aquatic species in these situations.

Pollutant Removal Parameters

There are several parameters that will determine the pollutant removal efficiency of a wet pond. These parameters include the pond geometry, wet pond depth, the area ratio, and the volume ratio. These parameters are discussed in detail in the following sections.

Pond Geometry

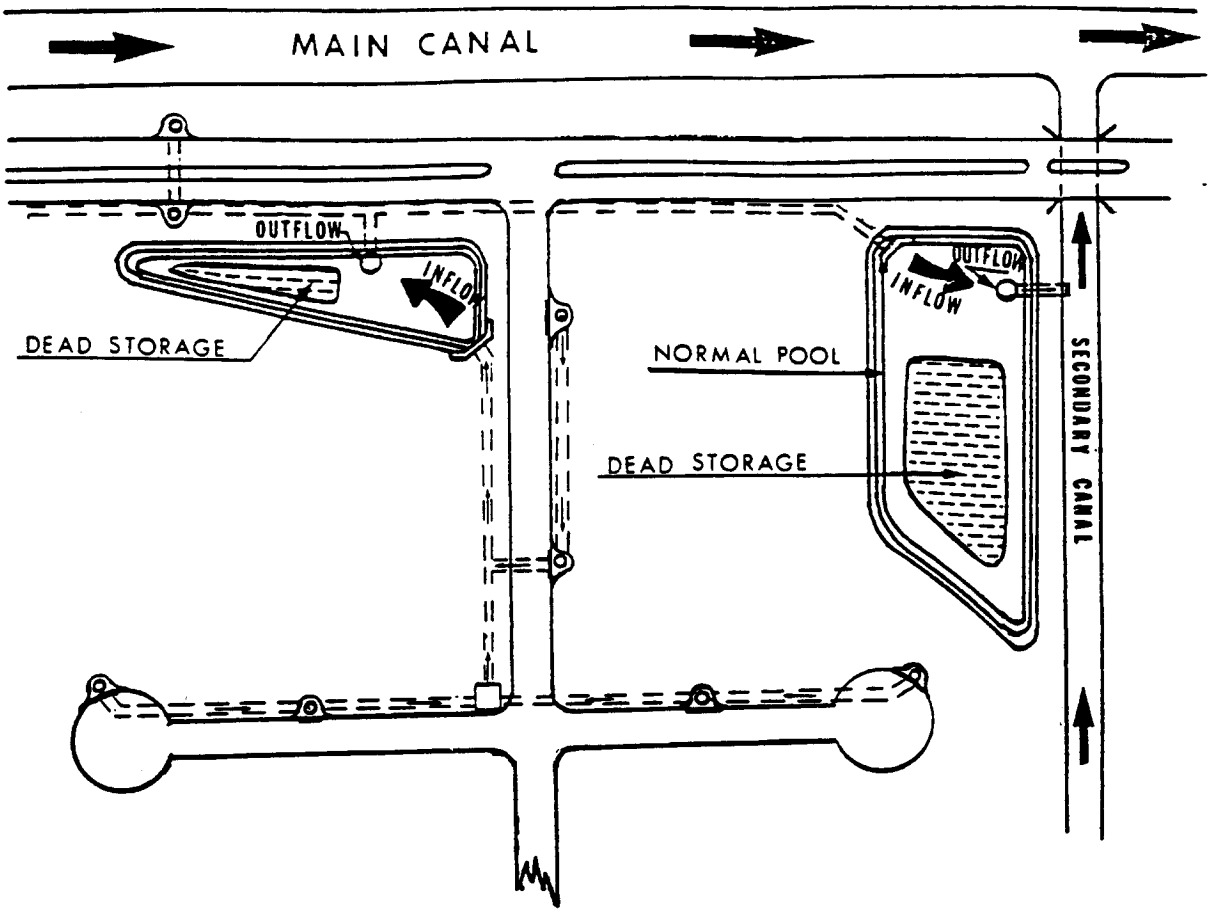
Most experts agree that the pond geometry has a strong influence on how effectively the permanent pool volume is used to remove pollutants. In some cases, there are areas of the pond that are ineffective in providing any pollutant control. This occurs in dead storage areas where inflow is bypassed without mixing. Figure 6-7 shows several examples of reservoir shapes which have large dead storage volumes and are to be avoided.

To avoid dead storage areas where mixing and settling of inflow pollutants do not occur, the length to width ratio should be no less than 3:1. In addition, a wedge shaped reservoir with the inlet located at the narrow end will maximize inflow mixing. If dead storage areas of flow are unavoidable based on topographic conditions, the effective length of flow can be increased by adding diversion barriers in the pond. These barriers may be created by a small island, a peninsula, or some sort of baffle.

Wet Pond Depth

Selecting the wet pond depth is dependent on the intended use of the pond. If the pond is to be a multiple purpose facility, the depth of the permanent pool will vary to provide water quality enhancement, wildlife benefits, and recreational uses.

Figure 6-7
EXAMPLES OF DEAD STORAGE AREAS IN WET PONDS



A shallow marsh habitat or wetlands environment can be created by a wet pool depth ranging from 1/2 to 2 feet. The shallow depth will allow emergent aquatic vegetation to be established which is very beneficial in removing nutrients and other attached pollutants from the water column. A shallow marsh area also provides an excellent environment for wildlife (Godfrey, 1985).

Florida Game and Freshwater Fish Commission has specified that optimum fish production will normally be achieved given a 6 to 8 feet deep pool over at least 1/3 of the surface area. A minimum surface area of 1/4 acre is also recommended for pond management purposes by some agencies such as the Soil Conservation Service.

With respect to water quality enhancement, a pond containing areas of both shallow depths (less than 2 feet) and deep depths (greater than 3 feet) may be the most beneficial. The emergent aquatic vegetation in the shallow areas will reduce nuturient loads into the pond which will prevent excessive algae growth. The deeper areas of the pond will provide pollutant removal by gravity settling during and after storm events.

Wet ponds should generally be limited to a maximum depth of 8-10 feet. Ponds that are deeper are envisioned to present a greater possibility for contributing toward potential groundwater contamination. Likewise, the

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creation of anaerobic conditions over large areas of the lake bottom is also seen as more likely under these circumstances. Consequently, the solublization of pollutants (e.g., metals and phosphorus) normally bound in the sediment and their release to the overlying water column is perceived to be probable by many regulatory agencies including the Department of Environmental Regulation.

Area and Volume Parameters of Wet Ponds

There are two important area and volume parameters that effect the pollutant removal efficiency of wet ponds. These parameters are the area ratio (A/A_S), and the volume ratio (VB/VR).

The area ratio (A/A_S) is determined by dividing the drainage area (A) by the wet pool surface area (A_S). For an example, an area ratio of 40 represents a 2 acre basin surface area serving an 80 acre drainage area.

Adherance to state guidelines that were discussed pertaining to the temporary storage and slow release of the first 1 inch of runoff will result in an area ratio of 18 or lower provided the depth of stage one is limited to no more than 18 inches. A basin surface area with a percentage of the contributing catchment area of 5 or more will maximize pollutant removal for most standard parameters including solids, traffic related metals, and nutrients (EPA, 1987). An area ratio of 18 or lower translates to a value of 5 percent or more in terms of the EPA criteria. Consequently, it may be concluded that the state criteria indirectly result in a maximization of design in this particular respect.

The volume ratio (VB/VR) is equal to the wet pool volume (VB) divided by the mean runoff volume (VR). The mean runoff volume (VR) can be estimated by multiplying the mean rainfall depth times the rational runoff coefficient (C), the drainage area of the basin, and the appropriate conversion factor.

In regard to (VB), for purposes of maximizing the assimilation of pollutants in wet ponds, particularly nutrients, the following statements were offered to the Department (CDM, 1985):

"Since the major biological mechanisms (e.g., algal uptake) for pollutant removal in a wet detention basin are essentially lake eutrophication processes, eutrophication modeling theory can be used to adequately size the permanent pool" .... A residence time of 2 weeks is considered to be the minimum duration that ensures adequate opportunity for algal growth."

The consultant goes on to state:

> "A design residence time of about 2 weeks is in the same order of magnitude as the residence times achieved by several of the wet pond BMPs monitored under the EPA NURP Study ... As may be seen, these recommended permanent pool storage volumes are equivalent to approximately 2.0 inches per impervious acre plus 0.5 inches per pervious acre."

In the consultants opinion, based on field experience, adherence to this simple to apply empirical approach will result in a detention basin wet pool volume (VB) sufficient to ensure that a hydraulic residence time approaching 2 weeks is achieved. The facility would also be expected to perform well from a water quality perspective. Consequently, it may be concluded that the basin volume to runoff volume ratio (VB/VR) determined by estimating VR and VB as discussed above is appropriate. However, it may be seen that the proper ratio will be highly variable. Its' value will depend on the average rainfall per event per region, the runoff coefficient, and the amount impervious area.

A slightly more rigorous approach to confirm that the appropriate basin volume to runoff volume is achieved, incorporates the average interval between storms into the previous assessment. In this procedure, VR is calculated as before. The value of VR is then multiplied times fourteen (14) days and divided by the average interval (days) between events to determine the volume of the basin permanent pool (VB).

For example, consider a 75-acre project, as discussed before, with an associated coefficient of runoff (C=.4), located in Tallahassee where the mean storm volume (P) is .65 inches. Rainfall statistics recorded at the airport show that the average interval between events equals 86 hours or 3.6 days. The appropriate basin volume (VB) in acre feet is determined as follows:

$$VB\ (Ac.Ft.) = [VR(A)\ (14\ days)/(Days\ interval\ between\ events)] \times CF\ (.083)$$

where:

VR = Coeffficient of runoff (C) x mean storm volume (P) inches.
Watershed area (acres)
CF = Conversion factor ac-in. to ac.ft. (.083)

The equation can be solved, assuming that the watershed area (A) is equivalent to the project area (75 acres) given the values of (C) and (P) that were specified above and an interval of 3.6 days.

VB (Ac-Ft.) = .083 (.4) (.65) (75) (14/3.6)
= 6.3 Ac.Ft.

The mean runoff volume VR would equal:

VR = CF (C) (P) (A) or
VR = .083 (.4) (.65) (75)
= 1.6 Ac.Ft.

Therefore the appropriate volume ratio in this example is VB/VR = 6.3/1.6 = 3.9.

Planning and Design Considerations

Emergency Spillway: In Florida designers often fail to provide for the occurence of catastrophic events. These oversights are not advisable. In any circumstance where damage to downstream property or public safety is jeopardized impoundment structures should be provided with emergency spillways which, as a minimum, can pass runoff from the one hundred year frequency storm without damage to the impoundment structure.

Discharge Structures: Discharge control devices may be either single-stage multi-stage devices. They should be designed such that the permissible release rate is not exceeded at the highest water level. The control structure should be adequately designed to prevent failure and resultant property damage and loss of life. Due consideration should be given to preventing the plugging of the discharge structure by debris. High intensity landuse areas with significant percentages of impervious surfaces should include provisions to prevent hydrocarbons (oil and grease) from exiting the discharge facility.

The outlet of the discharge device shall be protected from scouring. Riprap, plunge pools, energy dissipators or other acceptable means should be used for this purpose.

Sediment: Probable quantities of sediment from the drainage area should be estimated for the expected life of the pond taking into consideration future development trends. The structure should include capacity for sediment storage and provisions for periodic sediment removal if necessary.

Shoreline Protection: The shoreline of large impoundments should be adequately protected from littoral currents or wave action which can cause shoreline erosion.

Draining: Provisions should be made for completely draining wet ponds to allow periodic cleaning, inspection and maintenance. Drain facilities may be an integral part of the flow control structure or a separate structure. However, these features invite misuse. Permitting authorities have begun to require that gate valves for this purpose be locked. Keys are supplied only in the appropriate circumstances.

Multi-Purpose Ponds: Permanent ponds designed for multiple use should meet the specific requirements of the uses intended in addition to the stormwater management requirements stated herein.

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Safety: Ponds which are readily accessible to populated areas should incorporate all possible safety precautions. Steep side slopes at the perimeter should be avoided or fenced and dangerous outlet facilities should be protected by enclosure. Warning signs for deep water and potential health risks associated with body contact recreation should be used wherever appropriate.

Aesthetics: A storage facility is an integral part of the environment and therefore should serve as an aesthetic improvement to the area if possible. Use of good landscaping principles is encouraged. The planting and preservation of desirable trees and other vegetation should be an integral part of the storage facility design.

Construction Specifications

Widely acceptable construction standards and specifications such as those developed by the USDA - Soil Conservation Service or the U.S. Army Corps of Engineers for embankment ponds and reservoirs should be followed to build the impoundment. Attention to details of construction and adherence to specifications are as important as adequate investigations and safe design. A safe design can be ruined by poor construction.

Chapter 17 of the SCS Engineering Field Manual provides guidance on construction methods for the various elements of a pond or reservoir. Specifications for the work should conform to methods and procedures for installing earthwork, concrete, reinforcing steel, pipe, watergates, metalwork, woodwork and masonry, that are applicable to the site and the purpose of the structure.

Maintenance

Maintenance is of primary importance if urban impoundments are to continue to function as originally designed. A local government, a designated group such as a homeowners' association, or some individual must accept the responsibility for maintaining the structures and the impoundment area. A specific maintenance plan should be formulated outlining the schedule and scope of maintenance operations.

Debris removal in detention basins can be achieved through the use of trash racks or other screening devices.

Maintenance of sediment and debris basins is extremely important. Plans should include provisions for sediment removal when a certain storage elevation is reached. Debris should be removed from the basin following each storm.

Design with maintenance in mind. Good maintenance will be crucial to successful use of the impoundment. Hence provisions to facilitate maintenance

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operations must be built into the project when it is installed. Maintenance must be a basic consideration in design and in determination of first cost.

A permanent easement at least fifteen feet in width should be provided around the perimeter of an impoundment to allow for maintenance and to provide a buffer from encroachment. The easement should be measured from the maximum elevation of the storage pool. An easement also must be provided for access to the impoundment location.

The following are some items which should be considered in formulating a maintenance plan:

Sediment: Sediment deposition should be continually monitored in the basin. The maintenance plan should specify a specific point or elevation at which the sediment should be removed. Owners, operators, and maintenance authorities should be aware that significant concentrations of heavy metals (e.g., lead, zinc., and cadmium) as well as some organics such as pesticide, may be expected to accumulate at the bottom of these treatment facilities. Testing of sediment (EP Toxicity) especially near points of inflow should be conducted to determine the leaching potential and level of accumulation of hazardous material before disposal via landspreading or filling is prescribed.

Inlets: Pipe inlets should be inspected after each major storm, and accumulated debris and sediment should be removed each year.

Outlets: During each year of operation pipe outlets should be inspected after each storm to determine whether outflow is causing erosion. Wherever such erosion is detected, effective measures should be taken to stabilize and protect the affected area. These precautions are particularly important during the immediate post construction phase of the project.

Vegetation: Trees and shrubs should be kept off of dam and emergency spillway areas. Should these plants die from disease, lighting or other causes, their large and decaying root system can seriously reduce the stability of an embankment. Vegetation should be maintained for critical area stabilization as specified in vegetative practices contained in this handbook.

Insects: Precautions should be taken to minimize the production of fast-breeding insects in and around the ponded area. Possible control measures include controlling the growth of grass at shorelines, varying the water depth every few days, and stocking the pond with larvae-eating fish.

Safety Inspections: All permanent impoundments should be inspected periodically by a qualified professional engineer to insure that they remain structurally sound and mechanically efficient. An annual safety inspection is ecommended where the potential for downstream damage and loss of life due to impoundment failure is high. All structures should be inspected following major storms as well.

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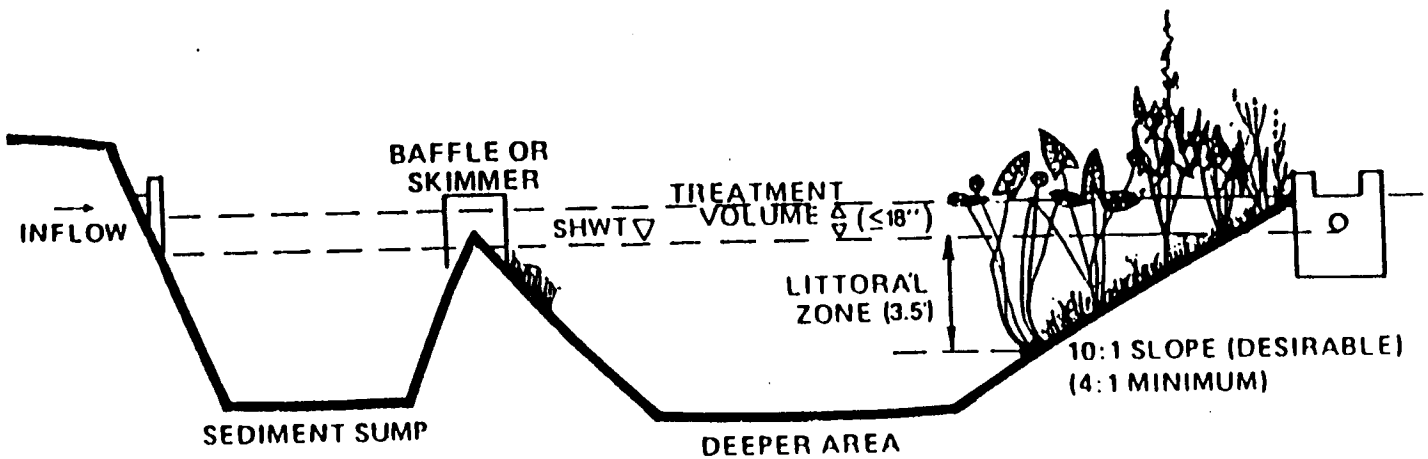
FIGURE 6-8

WET DETENTION SYSTEM

POND CONFIGURATION - A



Source: Southwest Florida Water Management District Management and Storage of Surface Waters, Permit Information Manual, Vol.I, March 1988.

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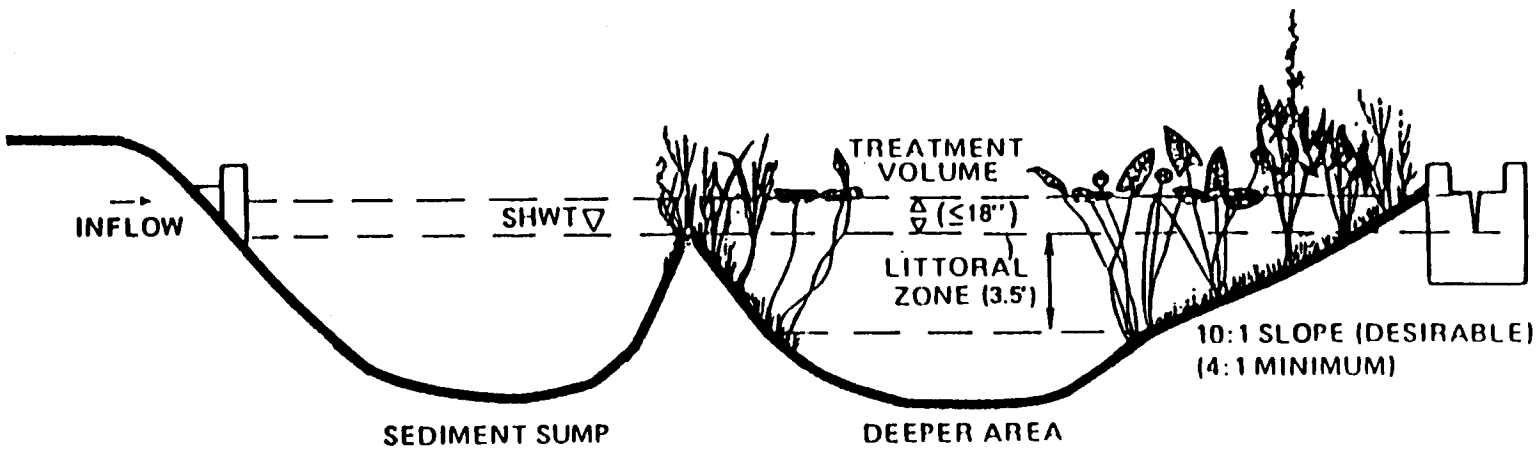
FIGURE 6-9

WET DETENTION SYSTEM

POND CONFIGURATION - B



Source: Southwest Florida Water Management District Management and Storage of Surface Waters, Permit Information Manual, Vol.I, March 1988.

SW BMP 3.03

EXFILTRATION TRENCHES

(also referred to as infiltration pits and trenches)

Definition

On-site retention of stormwater accomplished below the ground. The subsurface retention facilities most commonly used in Florida are excavated trenches, backfilled with coarse graded aggregate. Stormwater runoff is collected for temporary storage and infiltration. These facilities often include perforated pipe. Water is exfiltrated from the pipe and infiltrates the trench walls and, to some extent, the trench bottom for disposal and treatment. The addition of the pipe is viewed to increase the storage available in the system and helps promote infiltration by making delivery of the runoff waters more effective and evenly distributed over the length of the facility. Most designs include a weir overflow structure or a diversion sometimes called a "smart box". The device is installed at the point of inflow to the trench system. Its' purpose is to route a specified volume of stormwater in the perforated pipe and trench for percolation into the surrounding soil. Excess water from larger storms is by-passed away from the facility (see Figure 6-10).

Purposes

1) To retain the "first flush" of stormwater runoff to promote water quality improvement.

2) To reduce the runoff volume and peak discharge rate from a site, thus contributing to a reduction in downstream flooding and channel degradation.

3) To filter contaminants out of runoff before it reaches receiving waters and promote recharge of groundwater supplies.



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Conditions Where Practice Applies

Where the subsoil is sufficiently permeable to provide a reasonable rate of infiltration, and where the water table is sufficiently lower than the design depth of the facility to prevent pollution of the groundwater. This practice is normally used where space is limited and land is expensive. Frequently used for the disposal of runoff from roof drains, parking lots, tennis courts and roadways. This practice is not recommended where runoff water contains high concentrations of suspended materials unless a presettling or filtering mechanism is provided. Likewise, grease and oil traps are also highly recommended prior to discharge to these systems. These precautions are primarily for maintenance reasons since exfiltration systems are very susceptible to clogging and sediment build up reducing their hydraulic efficiency and storage capacity to unacceptable levels.

Planning Considerations

Under conditions of natural vegetative cover, a considerable portion of the rainfall from minor storms evaporates or is held or absorbed by the vegetation. Most of the remainder infiltrates into soil so that very little runoff occurs. Conditions can change radically with typical urban developments such that considerably less rainfall is taken up by plants or infiltrated into the soil. Infiltration measures offer a way to restore the hydrologic balance on a developed site by providing a facsimile of the natural process of infiltration.

Site Characteristics: The degree to which subsurface infiltration can be used depends upon the physical characteristics of the soils, the nature of the local groundwater system, and the depth of bedrock. Typically, exfiltration/infiltration systems would not be recommended in high water table areas nor locations where the limestone aquifer is within a few feet of the land surface. This advisory is due to an obvious reduction in the capacity to percolate water and the increased potential for groundwater contamination. Nonetheless, exfiltration systems have become widely used in several areas where such conditions persist. There are a variety of reasons for their popularity, including high land cost, lack of space for other means of treatment and deteriorating surface waters in coastal areas associated with highly polluted runoff from development and increasing levels of salinity (salt water intrusion) due to over drainage.

Integrated Runoff Control: Infiltration may be incorporated as one part of an overall runoff control system using several different techniques. For larger sites, or in places where most of the site is impervious, infiltration measures may be capable of handling only a portion of the runoff and pollutant loading.

Types of Facilities: Exfiltration and infiltration trenches consist of long narrow excavations with depths normally less than 6 feet. The geometry

of these facilities can be variable; however, wide, shallow trenches usually have higher infiltration rates than deep narrow ones. As a general rule, the ratio of side area to bottom area should not exceed 4:1. Figure 6-10 shows a cross section of a typical trench draining a paved parking area.

Exfiltration trenches of various design represent the primary stormwater quality treatment practice used in Florida to address existing highly urbanized problem spots (retrofitting). Since the mid to late 1970's both Dade County and the City of Miami Department of Public Works have been installing underground storage and percolation trenches to reduce the level of direct stormwater discharges to their extensive canal system. Likewise, the City of Orlando has used exfiltration trenches as a primary means to lower the stormwater pollutant load impacting the quality of its' lakes, beginning with Lake Eola located in the heart of the downtown business district. Both efforts have been reasonably successful.

The principal types of these management practices that would normally be installed to improve the water quality of existing systems in Miami, Florida are illustrated in Figures 6-11 and 6-12. These practices are designed to provide various amounts of on-line retention, typically accommodating runoff from a three-year to ten-year design storm, depending on land use. A sizeable portion of the runoff water is usually percolated directly into the limestone.

The Dade County (208) Areawide Water Quality Management Plan (1979) notes that the French drain method was very cost effective. As shown in Figure 6-11, French drains are supported by ballast rock. Such structures are used mainly in northern Dade County, where the soils are not capable of supporting an open straight sided trench. Most French drain systems use 24" pipe at a cost of $28/linear foot (1979 prices). Larger pipes are necessary only in areas where an excessive amount of stormwater is expected. The maintenance costs published for this system range from $3/linear foot for the flushing of the pipes to $30/year/catch basin for removal of debris.

Much like a French drain, a slab covered trench is no more than a ditch cut at least one foot below the water table. The main difference in the two systems, as seen in Figure 6-12, is that the slab covered trench contains no coarse aggregate nor a distribution pipe. The system allows a free, unobstructed interaction with the groundwater. Again, as with the French drain, a catch basin(s) must accompany each trench. The cost of the system is identical to that of the French drain with maintenance costs also being similar (catch basin cleaning). Covered trenches are installed in the central and southern parts of the county where the substrata is limerock. Wide use of these facilities is possible due to the high transmissivity of the shallow aquifer in Dade County. These systems handle water quantity and hopefully improve water quality. They are thought to attenuate pollutants through chemical reactions within the aquifer.

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FIGURE 6-10
Cross-Section of Typical Infiltration/Exfiltration
Trench System for Parking Areas or Roadways

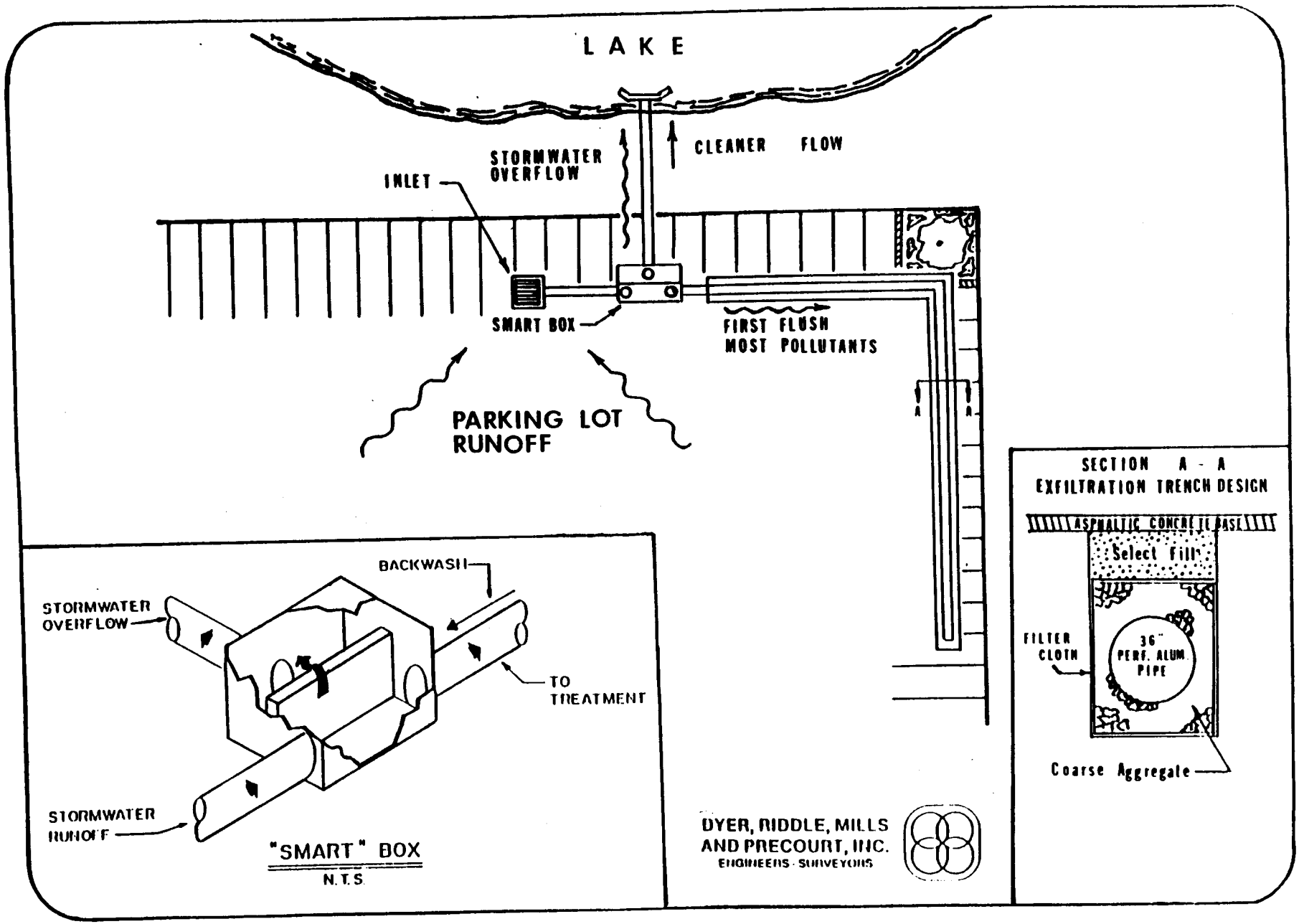

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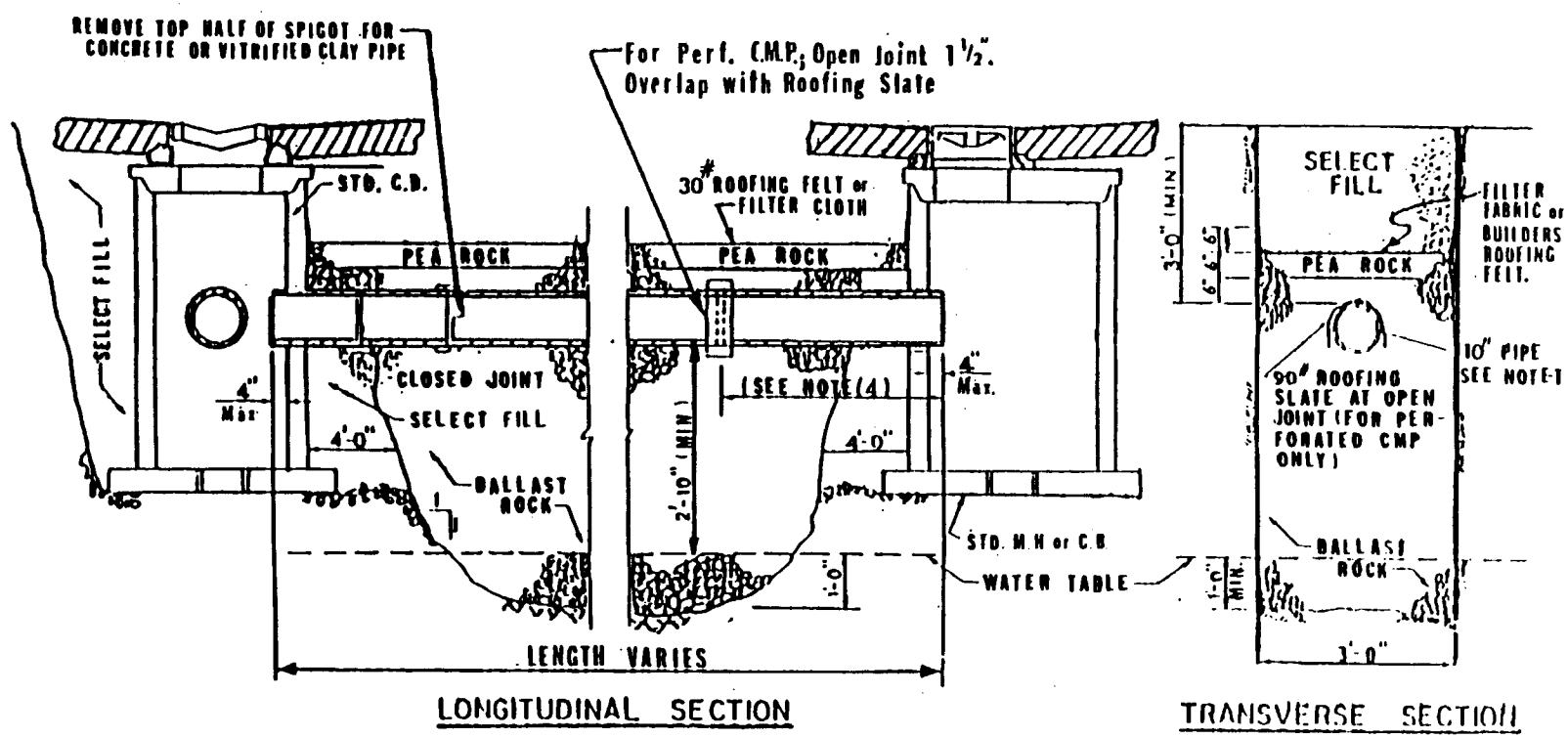
FIGURE 6-11
FRENCH DRAIN (EXFILTRATION TRENCH), DADE COUNTY, FLORIDA



NOTES:

1) If 10" conc bell & spigot pipe 5' long is not available, pipe, up to 24" in diameter may be substituted.

2) If conc bell & spigot pipe is not used or if the length of pipe used is greater than 5', 3/4" saw cuts shall be made at intervals of 2' thru the upper half of pipe, 5' lengths may be used for vitrified clay pipe.

3) The contractor has the option of installing the following pipe types:
   A. Concrete - perforated or non-perforated (bell spigot)
   B. Vitrified Clay - " " " " " "
   * C. Corrugated Metal - Bituminous coated (perforated)
   * D. Corrugated Aluminum (perforated)

4) No pipe perforations for 10' ±.

* 1/4" to 3/8" dia. hole, spaced at 2-3/4" ± (minimum 162 holes per lin.ft.)

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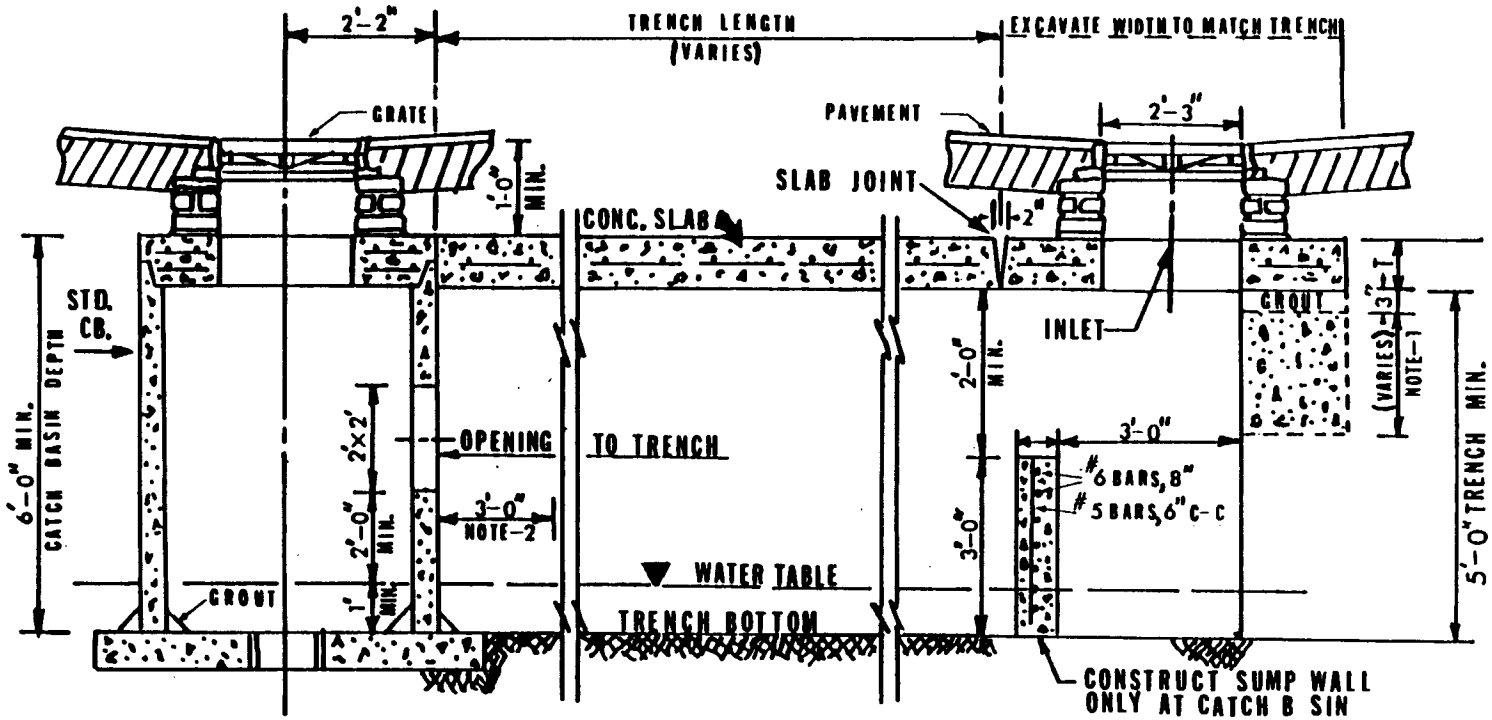
FIGURE 6-12
TYPICAL SECTION, SLAB COVERED TRENCH, DADE COUNTY, FLORIDA



LONGITUDINAL SECTION

NOTES:

1) If material at edge of ditch is unsuitable for foundation underslab, clean out and backfill with concrete. Depth of backfill varies.

2) Transition to trench bottom when it is lower than catch basin bottom.

In cases where pollutants such as oil and grease are expected in high quantities, added protection is given to the groundwater through separation devices built into the seepage system design. However, the verdict is not in on any potential negative impacts these systems may have on the quality of groundwater supplies. In Dade County, special attention is given to those facilities lying in heavily industrialized areas and within the cone of influence of a wellfield. Nevertheless, such procedures are not strongly encouraged by the Department on a general use basis. Unless pretreatment is provided a case by case evaluation of the groundwater characteristics and the probable effects given the constituents expected in the stormwater is normally required.

The counterpart of the Dade County exfiltration system as applied in the Orlando, Lake Eola watershed is illustrated by Figure 6-13. Notice that the system shown at the top of the page includes a baffle or spliter as discussed previously. The purpose is to divert the "first flush" or initial one-half inch of runoff into the exfiltration system.

Also notice that the second system shown receives runoff directly from the street. This circumstance is not normally recognized as a good idea from an operation and maintenance perspective. However, the city reports that several of these systems have functioned without failure and with only minimal maintenance for nearly ten years. Other jurisdictions have not been so lucky.

Stormwater discharge that may include synthetic organic compounds such as solvents should be monitored for several storms before design plans are made. This precaution is particularly important in any area where the aquifer must be protected. The absence or occurrence of any pollutants that might not be treatable via filtration through the soil, sand or limerock should be established prior to designing a treatment system. In these instances it is always possible that the physical, chemical, and hydrologic properties of the constituent may be known such that an effective scheme could be devised to increase the effectiveness of the system to handle these exotic pollutants.

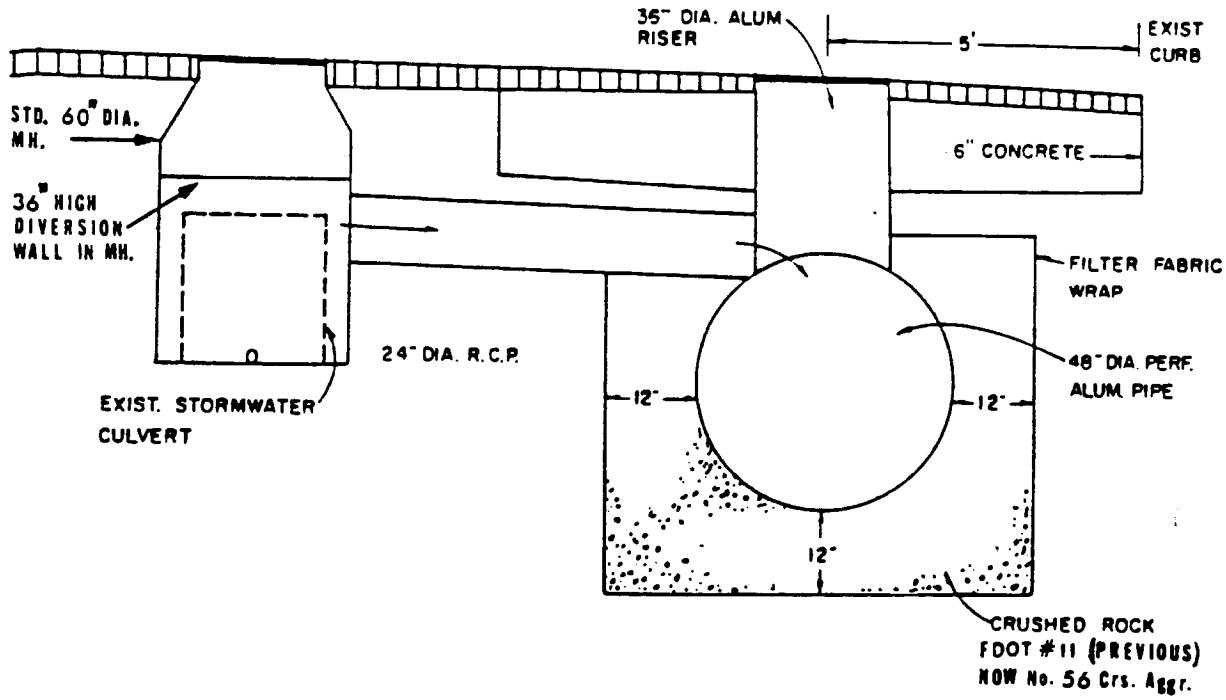
Runoff Filtering: To improve the length of time between major maintenance, grease, oil, floatable organic materials and settleable particles should be removed from runoff water before it enters the infiltration facility. These materials can take up storage capacity and reduce infiltration rates. Runoff filtering devices such as grass borders or filter strips, swales, sediment traps, and grease traps can be used to remove objectionable materials. Figure 6-14 illustrates the concept of using a vegetated area for these purposes as practiced in Maryland.

Design Criteria

Local criteria for the design of infiltration and exfiltration facilities

FIGURE 6-13

Examples of Typical Underground Percolation Systems
for
Retrofitting Existing Stormsewer Systems in Orlando, Florida



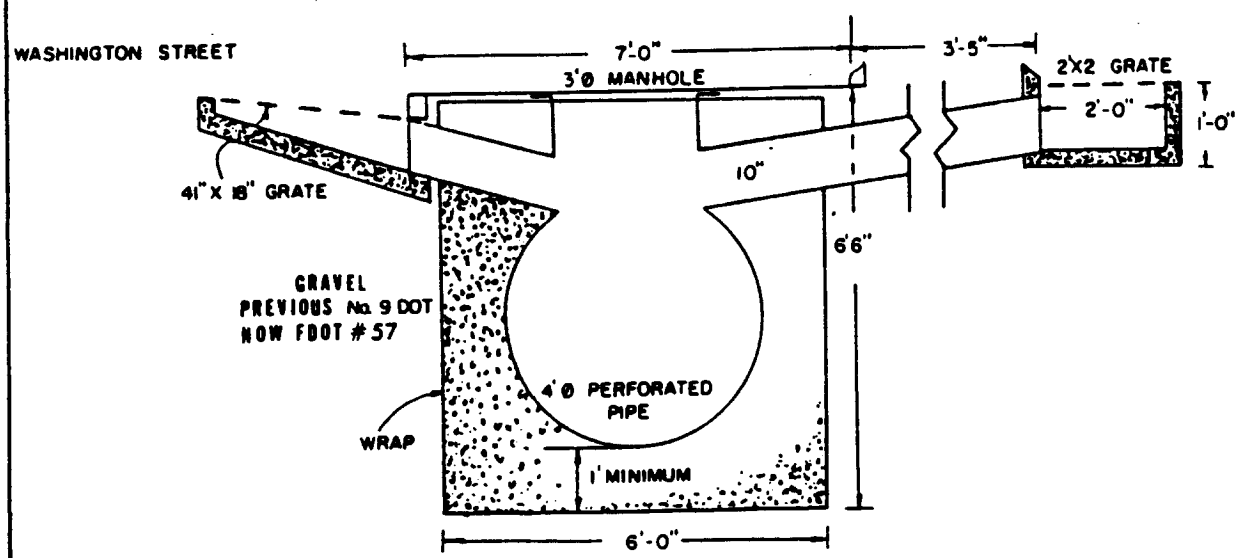


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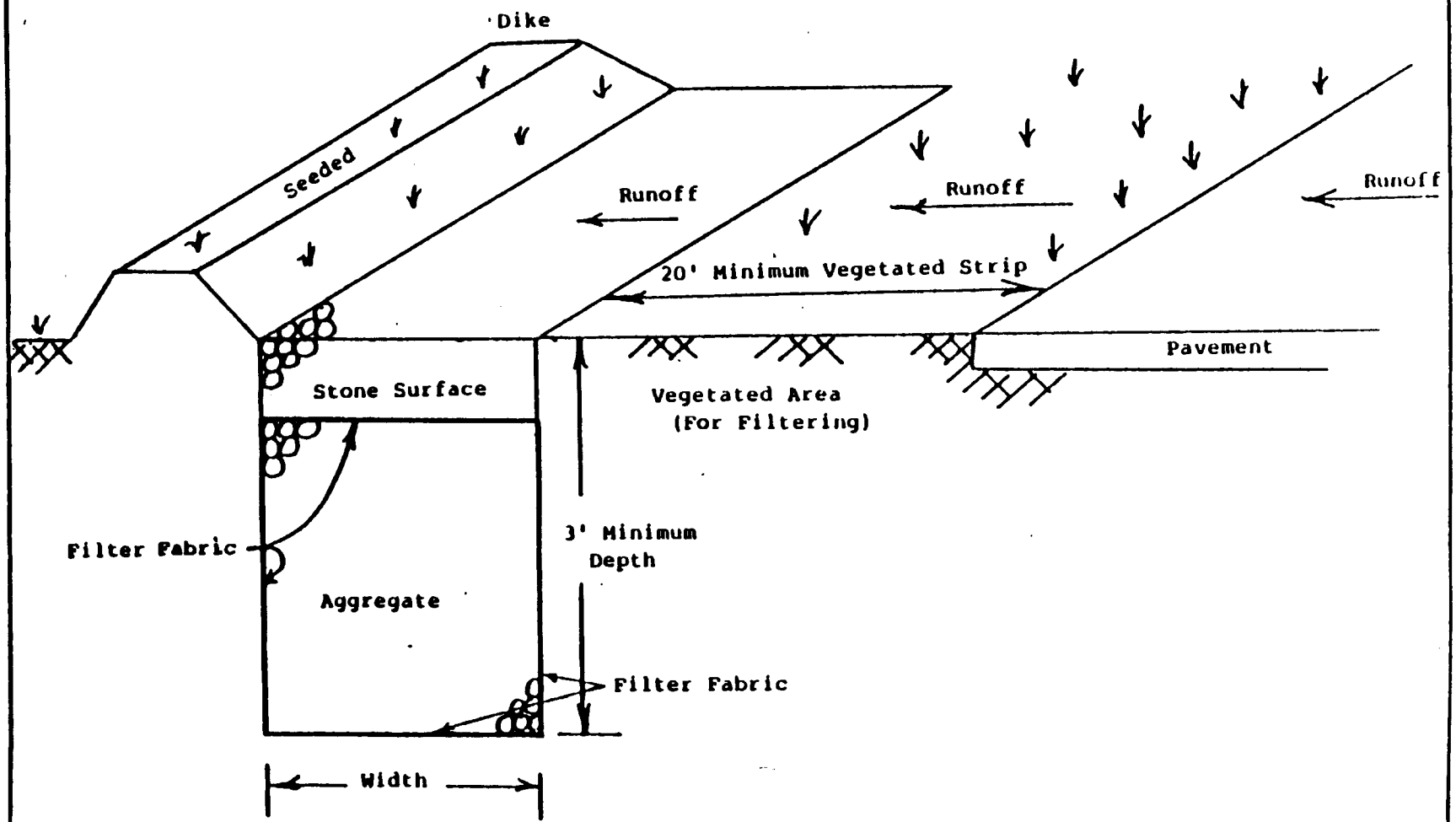
FIGURE 6-14

Example Application of a Vegetated Area for
Pretreatment of Runoff Prior to Exfiltration in Frederick Co. MD



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should be followed when they exist. Since this practice may also be used for flood control to some extent, local regulations may affect (increase) the minimum design requirements established by the state for water quality protection as discussed herein.

Storage Capacity: The size of an infiltration facility is dependent upon its purpose. For pollutant removal purposes, the larger the storage capacity the greater the removal efficiency. A storage volume to accommodate the first half-inch of runoff or the runoff from the first inch of rainfall is estimated to provide up to 80% annual removal efficiency.

To meet minimum state retention requirements, the trench must have the capacity to retain the above volume without direct discharge. Storage volumes may be calculated in the same way as other retention facilities. These systems are usually located in highly impervious but rather small watersheds. In these instances, the time of concentration usually will not effect the overall storage capacity. Water from the most distant reaches of the watershed will be delivered to the treatment facility within a few minutes of water from down gradient. Consequently, the storage capacities will not need to be significantly increased to maintain the desired level of pollutant removal (i.e., 80% - 90%). Therefore, the effect of watershed shape, size, and time of delivery may usually be ignored.

The storage volume required may be calculated very simply if exfiltration from the system is not used in an attempt to reduce the size of the facility.

Volume of Storage Required (ft^3) = VsR

$$VsR = 1/2 \text{ in.} \times A \text{ (acres)} \times \frac{43560 \text{ ft}^2}{\text{Ac}} \times \frac{1 \text{ ft}}{12 \text{ in.}}; \text{or,}$$

$$VsR \ (ft^3) = 1815 \ A$$

Void Space: Most infiltration facilities are designed with aggregate fillers as shown in Figures 6-10 through 6-13. To estimate the available storage volume, the designer must know the void ratio of the aggregate. Generally, stone of up to 1.5-inch diameter is acceptable. Rounded stones have higher void ratios than angular crushed stone.

In most areas of Florida, the volume associated with coarse aggregate is computed based on 40% - 50% voids. The storage volume available in an exfiltration trench without a distribution pipe (as illustrated by Figure 6-14) may be determined as follows:

Volume Storage Available: VsA (ft^3) = volume of void space.

VsA = 0.5 (i.e., void ratio) x W x H x L; or,
VsA = 0.5 WHL ft^3

where:

W = trench width (ft)
H = depth of trench or that part above the seasonal high water table (ft)
L = trench length (ft)

In order to satisfy the general permit criteria in Chapter 17-25 F.A.C.

VsA must be equal to or greater than VsR

by substitution;

0.5 WHL = 1815A

In most cases the depth of the trench (H) and the width (W) are predetermined or selected by the engineer. Trench dimensions of 4 ft. x 4 ft. or 3 ft. x 3 ft. are quite commonly chosen by many designers. However, the equation may be rearranged to solve for any of the three trench dimensions desired. To determine the length of trench (L) required (most common situation) the equation becomes:

$$L = \frac{3630\ A}{WH}$$

where:

A = contributing drainage area in (acres); and,

All other terms are the same as discussed in the previous equation.

Open Space in Pipes: Facilities with perforated pipes for distribution may include the area inside the pipe above the water table as available storage. The equation for calculating the length of trench required given this circumstance is derived as follows:

Volume of Storage Required (VsR) = 1815 A;
as before, VsR must = Volume of Storage Available (VsA)
VsA = pipe volume + [(trench volume - pipe volume) x (void ratio)]

Assume:

- L = trench length and that pipe length and trench length are approximately equal.
- Void ratio of coarse aggregate in the trench surrounding the pipe = .5
- trench volume = WHL

Given:

- Storage Volume in the pipe (pipe volume) = $\frac{\pi d^2 L}{4}$; and,

by substitution:

$$1815\ A = \frac{\pi d^2 L}{4} + (WHL - \frac{\pi d^2 L}{4})\ (.5)$$

$$= \frac{\pi d^2 L}{4} + \frac{(WHL - .25\pi d^2 L)}{2}$$

$$= \frac{\pi d^2 L}{4} + \frac{2\ WHL}{4} - \frac{.5\pi d^2 L}{4}$$

multipling both sides by 4 the equation becomes:

$$7260\ A = \pi d^2 L + 2\ WHL - .5\pi d^2 L$$
$$= \pi\ 2\ WHL + .5\pi d^2 L$$
$$= \pi\ (2WH + .5\pi d^2)\ (L)$$

solving for L

$$L = \frac{3630\ A}{WH + .25\pi d^2}$$

where all symbols are the same as in previous equations or as discussed above and d = pipe diameter in (ft.).

Example Problem

Given: A 4' x 4' exfiltration trench constructed for a 2 acre project. What is the length of trench required to retain the first half-inch of runoff? Assume a 12-inch diameter perforated pipe is used to distribute

runoff water evenly along the entire length of the system and that the percent voids or porosity of coarse aggregate = 0.5 or 50%.

Solution

Working through the various factors in the equation previously discussed:

A = area = 2 acres
W = trench width = 4 ft.
H = trench depth = 4 ft.
π = constant = 3.1416
d = pipe diameter = 12 in. or 1 ft.

substituting into the equation

$$L\ (ft) = \frac{3630\ (2)}{(4)\ (4) + \frac{\pi\ (1)}{4}} = 432.5\ ft.$$

If the 1 ft. diameter perforated pipe was not used for distribution or to increase storage, the trench length required would have equaled 453.75 ft. As may be seen, small diameter (1 ft or less) pipe makes little difference in trench length (slightly less than 5%). However, using 24-inch pipe can reduce trench length to 379.3 ft. while 36-inch pipe reduces the system to 314.7 ft. or approximately 16% and 31% respectively.

Analysis of Drawdown Time: Similar to other retention systems, exfiltration facilities designed to meet state pollution control requirements must also demonstrate the capacity to percolate the required treatment volume (1/2" runoff) within a 72 hour time frame. This factor may be checked with Darcy's Equation (Q = KiA) using the results of field percolation or infiltration testing described in Appendix 6-2. The infiltration velocity "K" (length/time increment) is equated to flow "Q" (volume/time increment) based on horizontal cross-sectional area "A" of the trench (width x length) with an assumed gradient of unity (i = 1).

The exfiltration rate calculated using this equation is subsequently divided into the retention volume required to determine drawdown time. If the time for drawdown exceeds 72 hours the length of the system is expanded and rechecked until the final design meets both retention volume and drawdown requirements. A safety factor of 2 is normally used, to double the above result.

Alternative Sizing Procedures: The method of sizing exfiltration systems discussed above is strictly related to the department's pollution control requirements for stormwater. It is based upon a showing of a specific amount of retention available in the trench above the water table regardless of the infiltration which takes place during the course of a storm.

Other procedures have been developed for sizing these facilities in which the designer determines the time related inflow and infiltration. These designs include consideration of both storage in the trench soil infiltration inherent in the system.

The two major elements of these designs consist of a mass inflow or runoff analysis for the project and an analysis of mass outflow (volume exfiltrated) with time. A specific design storm (e.g., 3-year 1-hour duration) is sometimes stipulated by the regulating authority for these evaluations; or, the designer may be asked to check a range of event sizes for the critical storm (e.g., the one which requires the maximum level of storage). Storage is usually provided within the trench for the difference between inflow and exfiltration. The most often used sizing criteria of this type (developed by the South Florida Water Management District) is based on a volume of storage equivalent to 50% of the greater of the first inch of runoff from the total project or 2.5 inches of runoff times the impervious acreage. The length of the system is determined using a safety factor of 2 equating the runoff volume generated from the design event with the storage volume available in the trench (50% voids assumed) plus the volume exfiltrated out of the trench during the course of the storm (1 hr.).

Obviously, there is a rather sizeable disparity between the treatment volume required by the South Florida Water Management District (SFWMD) versus that which is specified by the department. At a minimum the volume to be exfiltrated is double the one-half inch treatment volume associated with retention type systems permitted for other regions of Florida. Consequently, it is logical to presume that trench systems constructed in accordance with the SFWMD design equation would be larger and therefore more expensive than those planned and built on the basis of the state criteria. This anomaly is likely to lead most designers to question the wisdom of using the SFWMD procedure in any cases where it is not required.

However, as may be seen after an examination of the information in Table 6-3, the larger volume of treatment does not necessarily result in longer exfiltration systems. Trench lengths are inversely related to an increasing potential in the rate of percolation (e.g., hydraulic conductivity). Likewise, the SFWMD method outlined in the Volume IV Permit Information Manual results in a lowering of the amount of exfiltration trench required as the percentage impervious acreage is reduced if all other factors are equal. Consequently, when the potential rate of percolation is relatively high (e.g., 12 in./hr. or greater) and as the percentage impervious area approaches 70% or less, the designer may fair better using the alternative procedure.

Given a system that can be expected to actually percolate and store the volume of runoff required by SFWMD, these shorter facilities would still be expected to achieve a level of treatment equivalent to other systems that are permitted by state regulations. However, the water management district staff

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TABLE 6-3

Breakpoint Evaluation
of the
Effect of Hydraulic Conductivity on Trench Length

(For 4' trench, total depth 7', H=6', Hz=5', Ds=2', & Du=4')

		CRITICAL "K" (IN/HR) (1)	
PERCENT IMP (%)	(2) FDER (L)	VOLUME IV METHOD	LINE SOURCE METHOD
70	3244	6.78	9.79
80	3244	8.12	14.01
90	3244	9.45	18.98
95	3244	10.11	21.75

ASSUMES: Depth of bore hole for perc test (hw) = total depth of trench.
re/rw = 30/.375 = 80
depth below water table of bore hole (he) = Ds.

NOTE:

1) Values less than K will result in Trench Length greater than FDER Length Equation Values shown in Column 2. Values greater than K will result in Trench Length less than FDER method.

2) Based on W = 4', H = 4' above WT, A = 15 acres pipe diameter 1 ft. and void ratio = .5 for one-half inch runoff storage.

$$L = \frac{3630\ A}{WH + \frac{\pi}{4} d^2}$$

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recently complete preliminary research which demonstrates that the standard trench design procedure referred to as the "Volume IV Method" has a tendency to yield trench lengths that are too short to accomplish the degree of infiltration for which they were designed. In tests of two exfiltration trenches that were constructed at the district office in West Palm Beach, computer exfiltration rates obtained using the standard (Volume IV) method were found to be greater than observed rates measured during the one hour design period by 32% to 158% (SFWMD, 1988)

An alternate procedure **"The Line Source Method"** was also explored by the district staff during the study. This method is most sophisticated in accounting for transient conditions relative to changes in head and the depth of the saturated and unsaturated zone, as well as the reduction in the hydraulic gradient which occurs after a storm begins and the trench is filled with runoff waters and groundwater or water table mounding begins to take place. The procedure results in a lowering of the rate of percolation projected during the course of the design storm. Consequently, a concommittant increase in the length of exfiltration trench required is projected. Table 6-3 also demonstrates the magnitude of difference in trench length which resulted when the Line Source Procedure was used to size this particular trench system.

The input data is slightly more rigorous to obtain, but the method shows evidence of much improvement in accuracy. The alternate method was found to provide estimates within 13% of measured rates in the study cited earlier. The procedure currently is being considered for adoption by the district. Table 6-4 lists the results of an assessment that was performed to determine the exact value in the soil hydraulic conductivity (K) by percentages of impervious acreage which, if exceeded, would result in trench lengths less than those required by the Department. The evaluation was based on the same hypothetical trench configuration used to generate the data in Table 6-3. The results show that the break point or critical value of K is quite variable depending on which sizing equation is used by the designer.

While not shown on the table, it should be noted that the break point changes depending on the trench dimensions and water table configuration as well as the size of pipe used in the trench. However, the general relationship between the three methods is static. As shown in Table 6-4, the use of the Line Source Method serves to expand the range over which the SFWMD procedures will produce trench lengths longer than those computed using the DER method.

On the promise that the more storage provided in the trench the greater the treatment capacity, it may be concluded that the information in Table 6-3 and Table 6-4 demonstrates that either SFWMD procedure is likely to provide treatment (pollutant removal) greater than that required by the state given rates of percolation of six to ten inches/hour or less. In this particular instance, the new Line Source Method would provide equal or better treatment

TABLE 6-4

Comparison of SFWMD & FDER
Exfiltration Trench Sizing Equations

IMP AREA (%)	HYDRAULIC CONDUCTIVITY (IN./HR.)	TRENCH LENGTH (FT) LINE SOURCE	VOLUME IV	DER METHOD
70	6.0	3852	3537	3244
80	6.0	4403	4043	3244
90	6.0	4954	4548	3244
95	6.0	5229	4801	3244
70	12.0	3009	2080	3244
80	12.0	3439	2378	3244
90	12.0	3869	2675	3244
95	12.0	4085	2823	3244
70	24.0	2296	1141	3244
80	24.0	2624	1304	3244
90	24.0	2953	1467	3244
95	24.0	3117	1548	3244

NOTES: The hydraulic conductivity (K) inches/hour was converted to ft/sec and was used directly to determine length (L) in the Line Source Equation shown in Appendix 6-3. The (K) value (ft/sec) wa also used to determine (Qp) the inflow rate to bore hole (cfs) for the Line Source Method percolation test.

The radius of influence (re = 30') was assumed static for all comparisons. The total depth of the bore hole (hw = 7') was assumed equal to total trench depth. The radius of the bore hole (rw = $.75/_2$) for all situations. The value of Qp was subsequently substituted into the Usual Open Hole Test formula also in Appendix 6-3 to determine (K_{IV}) the Volume IV discharge coefficient (cfs/ft^2 - ft Head), assuming H_z = 5 ft, Ds = 2 ft and d = .75'. The value of K IV was used in the Standard Volume IV length equation to determine (L).

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over a wider range of soil conditions with maximum (K) values from 10 in./hour to nearly 22 in./hour as the percentage of impervious acreage increases from 70% to 95% respectively. Given a location with soil conditions such that the hydraulic conductivity (K) would exceed 24 in./hour, one may find that even the Line Source Method would result in a lower level of treatment. In this particular instance, a well drained sandy soil with rapid internal drainage would have resulted in less treatment than a similarly situated system designed according to the DER recommended procedure. Nonetheless, this circumstance does not necessarily indicate that the treatment level would be unsatisfactory. The potential percentage removal associated with either of the two SFWMD design procedure has not been established.

However, it is safe to conclude that the DER method, wherein the infiltration rate is not a factor in sizing (except at rates less than 1 in./hour) inadvertently works to ensure that facilities constructed in areas with more porous soil conditions will achieve a greater level of treatment than that associated with lesser permeable soils. Therefore, to the extent that the department's first half-inch treatment criteria can be relied on to accomplish 80 - 90% removal given the more moderate rate of percolation (e.g., 6 in./hr.), the DER method can be foreseen to result in more trench length than may be cost effective under highly permeable soil conditions (e.g., 24 in./hr. or more). Consequently, the (SFWMD) Line Source Method would be a more appropriate design equation given these circumstances.

A discussion of these procedures may be found in Appendix 6-3 at the conclusion of this chapter. For more information the reader may wish to refer to the SFWMD Permit Information Manual for the Management and Storage of Surface Waters.

Information Required Planning An Exfiltration System

Soils Analysis: A soils analysis should be submitted with the design plans to ensure that the substrate is suitable for percolation. It is recommended that the trench must have a percolation rate of not less than 0.6 inches per hour. Further evaluation should be made if the soils contain a high percentage of fine particles, since such materials have a much greater tendency to clog. Existing soil surveys may provide an estimate of percolation rates but it is helpful to have field tests performed in the vicinity of a proposed trench or pit. It is important to evaluate the permeability of all strata to a depth exceeding that of the proposed trench.

When using soil survey information, a site visit should always be conducted by a professional soil engineer or the Soil Conservation Service (SCS) to confirm the soil types and point out any obvious limitations to percolation that may not be included on the survey sheet. It is important to note that the SCS publications present a range of permeability values for any given

soil type at a particular location. The designer should use the lowest value since the actual infiltration capacity of the soil has been shown to be close to the minimum rate listed in these publications.

Topographic Information: Sufficient information concerning elevation changes land use, and cover must be available to perform a mass runoff analysis when the more complicated sizing procedures referred to earlier are used. On sloping lands these facilities must be built parallel to lines of equal grade perpendicular to the plane of the hill. Otherwise, the sizing procedures discussed previously would not apply. Facilities constructed along the plane of sloping lands are likely to experience extreme problems due to super saturation and potential piping of cover and fill material at the down gradient end of these structures.

Construction Design Criteria

Trench construction criteria for three different soil and geologic conditions are discussed below:

Trenches in Rock: Exfiltration facilities cut into permeable rock are quite often used in the Miami vicinity. These trenches are the least expensive infiltration system to construct; however, the following conditions must be met:

1) The rock must be able to support a specified wheel load on a covering concrete slab or other suitable cover.

2) The rock must be amenable to excavation without blasting, or the cost becomes prohibitive.

The inlet to the system can be placed directly over the slab cover, with discharge directly into the trench (see Figure 6-12). A more acceptable method is to set the inlet and catch basin adjacent to the trench and pipe the inflow to the trench. This technique lessens the introduction of debris into the system. Manhole access must be provided to facilitate cleaning and inspection.

Trenches in Stable Soil: In this type of trench, perforated or slotted pipe is normally used as the conduit. Coarse aggregate between the pipe and trench wall prevents side wall collapse and distributes collected water to the trench walls. Whether the pipe is included or not, the trench is usually 4 to 5 feet in width and of sufficient depth to reach a permeable soil layer.

Coarse aggregate or other free-draining material is generally placed in the bottom of the trench and brought up to a specified pipe flowline grade, generally a minimum of 2 feet. Perforated or slotted pipe is then placed in the trench and the trench is backfilled with the coarse aggregate to the design storage elevation. A typical Dade County installation sometimes

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includes a 6-inch thickness of finer textured filter material or pea rock placed over the aggregate backfill as shown in Figure 6-11. The trench will normally be covered with a barrier consisting of building felt, tarpaper, or other suitable material to prevent the sand or fill used for cover from piping and possible surface subsidence.

The trench cross-sections shown in Figure 6-11 and Figure 6-12 are typical of most installations in extreme southern Florida. The configuration is applicable in other areas where the soil or substrate is stable and provides sufficient infiltration capacity. Even where infiltration rates are marginal, the system could supplement the drainage requirements of a positive outfall system by storing, and infiltrating a portion of the storm water into the soil; thereby reducing the downstream requirements of the positive system.

Trenches in Cohesionless Soil or Sand: Although trenches in cohesionless soil require a different type of construction, the design, final shape, and size are the same as for a trench in stable soil. However, side slopes of 1.5:1 or 2:1 may be required, if the walls are not shored during construction. Filter cloth must be used along the periphery of the trench to prevent migration of soil fines into the coarse aggregate backfill.

In a trench system where perforated pipe is used, a non-perforated section some 6 to 8 feet in length is used to connect the trench to the catch basin or inlet. This procedure serves to prevent piping near structures and subsidence around the inlet. A concrete slab is generally placed around the catch basin or inlet.

In the design of a trench system, any one of the above types or combination thereof, may be used. It is recommended that a positive overflow pipe or bypass also be provided to allow for large storm events.

General Recommendations:

Proper construction and routine maintenance are extremely important for successful trench applications. A substantial number of trenches have failed shortly after being built, primarily due to poor construction practices, inadequate field testing or because sediment was not filtered or trapped before entering the trench. The discussion below highlights construction and erosion control procedures that should minimize the risk of premature clogging.

1) Before the entire development site is graded, the area planned for the trench should be roped off to prevent heavy equipment from compacting the underlying soils.

2) Diversion berms should be placed around the perimeter of the trench during all phases of construction. Sediment and erosion control plans

for the site should be oriented to keep sediment and runoff completely away from the trench area. Otherwise, actual construction of the trench should not begin until after the site is completely stabilized.

3) The trench should be excavated using a backhoe or trencher equipped with tracks or over-sized tires. Normal rubber tires should be avoided since they compact the subsoil and may reduce infiltration capability. For the same reason, the use of bulldozers or front-end loaders should be avoided.

4) Sediment control is critical. It is therefore important that sediment and erosion controls be inspected following each storm to make sure they still work. If a vegetated buffer strip is planned for pre-treatment of runoff entering the facility, grass should be established immediately, preferably by sodding. When hydroseeding is used, reinforced silt fences must be placed between the buffer and trench to prevent sediment entry before the buffer becomes fully established.

Trench Construction Specifications

Trench construction techniques will vary with local site conditions. Strict adherence to OSHA's Trench Safety Code or other local regulations relative to acceptable construction practice, should be observed. Depending upon the length and width of trench, either backhoe or wheel or ladder type trencher may be used for excavation. Excavated material should be stored at least 10 feet from the trench to avoid backsliding and cave-ins.

Perforated or Slotted Pipe: When perforated pipe is used for conveyance and distribution a liberal number of holes to ensure free and rapid flow in and out of the walls of the pipe should be provided. Large-sized pipe adds to total storage in the trench. The use of a pipe in the trench system also allows for ease of maintenance as described in the next section. The pipe serves as a catchment for sediment without reducing overall efficiency.

Pipes manufactured of plastic, steel, aluminum, concrete or other materials are available for this application. Perforated metal pipes usually have 3/8-inch diameter perforations uniformly spaced around the full periphery of a pipe. Specifications stipulate not less than 30 perforations per square foot of pipe surface. Other perforations not less than 5/16 inch in diameter or slots, are permitted if they provide a total opening area of not less than 3.31 square inches per square foot of pipe surface.

Tentative specifications for slotted concrete pipe with cast slots have been developed based on field performance and cooperative testing by Florida DOT and industry. Concrete pipe with 3/8-inch wide slots is usually specified. Slots should be circumferential in direction, approximately 3/8-inch in width and not less than 4 inches in length at the inside of the pipe. Four rows of

slots are generally specified for pipe 30 inches in diameter or less. Six rows are specified for pipe 36 inches in diameter and larger.

Pipe Backfill: Coarse aggregate backfill material serves to support the sides and top of an infiltration trench following construction. It also provides good bedding for distribution and overflow pipes. Aggregates for this purpose must be sound and comply with FDOT established specifications for durability. The material must provide sufficient void space to allow for the storage of the required volume of runoff. The designer should also allow for the accumulation of the normally encountered fine sands, silts, silty clays, and other material in stormwater to pass through the perforations or slots in the pipe conduit into the backfill during the expected life of the facility.

Clean, washed stone aggregate should be placed in the excavated trench in lifts, lightly compacted to form the base. Unwashed stone has enough associated sediment to pose a clear risk of clogging at the soil/filter cloth interface. Granite, washed pea-gravel or river rock is usually acceptable. Where possible, the use of crushed limestone aggregate should be avoided unless the limestone is washed, contains little or no phosphorus and is of the "hard" variety.

Pea Rock or Gravel: This material is often placed in a 6-inch layer over the top of the aggregate for the pipe backfill as illustrated in Figure 6-11. This layer serves as a filter below the impervious barrier (builders felt). The gradation for this layer should consist of 100% material passing the 1-inch sieve with not more than 5 percent passing the No. 4 sieve.

Synthetic Filter Fabrics:

When fine native materials are encountered in the excavation, a filter cloth envelope or wrap should be placed around the coarse aggregate backfill. This practice serves to prevent migration of fine materials from the surrounding soil that could result in clogging of the trench following reverse flow conditions resulting from high groundwater. A number of plastic woven or non-woven filter fabrics can be used for this purpose. However, care should be taken to prevent tearing or puncture of the fabric. Likewise, adjacent sheets should be well overlapped and secured to prevent openings from developing.

To ensure good performance, synthetic fabrics (either woven or non-woven) must be carefully selected, based on the properties required. As with aggregate filters, fabric filters must provide two very important functions:

1) They must be able to prevent clogging of the drain by the migration of erodible soil or other material from the substrate into the trench, which could also result in erosion, piping, or other problems with the facility being protected; and

2) They must not inhibit the free flow of water.

Care should be taken in selecting the proper kind of filter fabric, as available brands differ significantly in their permeability and strength. If desired, a six inch deep filter of clean, washed sand may be substituted for filter fabric on the bottom of the trench.

Likewise, the use of filter fabric directly surrounding slotted corrugated polyethelene pipe has recently become a popular derivation to the typical exfiltration trench design. In these facilities, sedimentation and filtration of particulates larger than the silt/clay size range takes place within the perforated pipe. Consequently, the pipe is more prone to clogging and large reductions in capacity will occur more often than usual. While this may seem unacceptable, manufacturers point out that the pipe may be cleaned relatively easy using high pressure hoses, vacuum systems, etc. On the other hand, conventional designs require complete replacement when clogging occurs.

Observation Well

An observation well is recommended for installation in every infiltration trench. The observation well will serve two primary functions:

1) It will indicate how quickly the trench dewaters following a storm; and

2) It will provide a method of observing how quickly the trench fills up with sediments.

A simple observation well may consist of perforated PVC pipe, 4 to 6 inches in diameter. It is usually located in the center of the facility and is constructed flush with the ground elevation of the trench as shown in Figure 6-15. The top of the well should be capped to discourage vandalism and tampering.

The observation well is needed to monitor the performance of the trench. It is also useful in marking the trench location. The drain time for a trench can be measured by placing a graduated dip-stick down the well immediately after a storm and again twenty-four and forty-eight hours later.

For the first year after completion of construction, the well should be monitored on a quarterly basis and after every large storm. It is recommended that a log book be maintained indicating the rate at which the facility dewaters after large storms and the depth of the well for each observation. Once the performance characteristics of the structure have been verified, the monitoring schedule can be reduced to an annual basis, unless the performance data indicate that a more frequent schedule is required.

A monitoring well in the top foot of stone aggregate will be required when the trench has a stone surface. Sediment build-up in the top foot of stone

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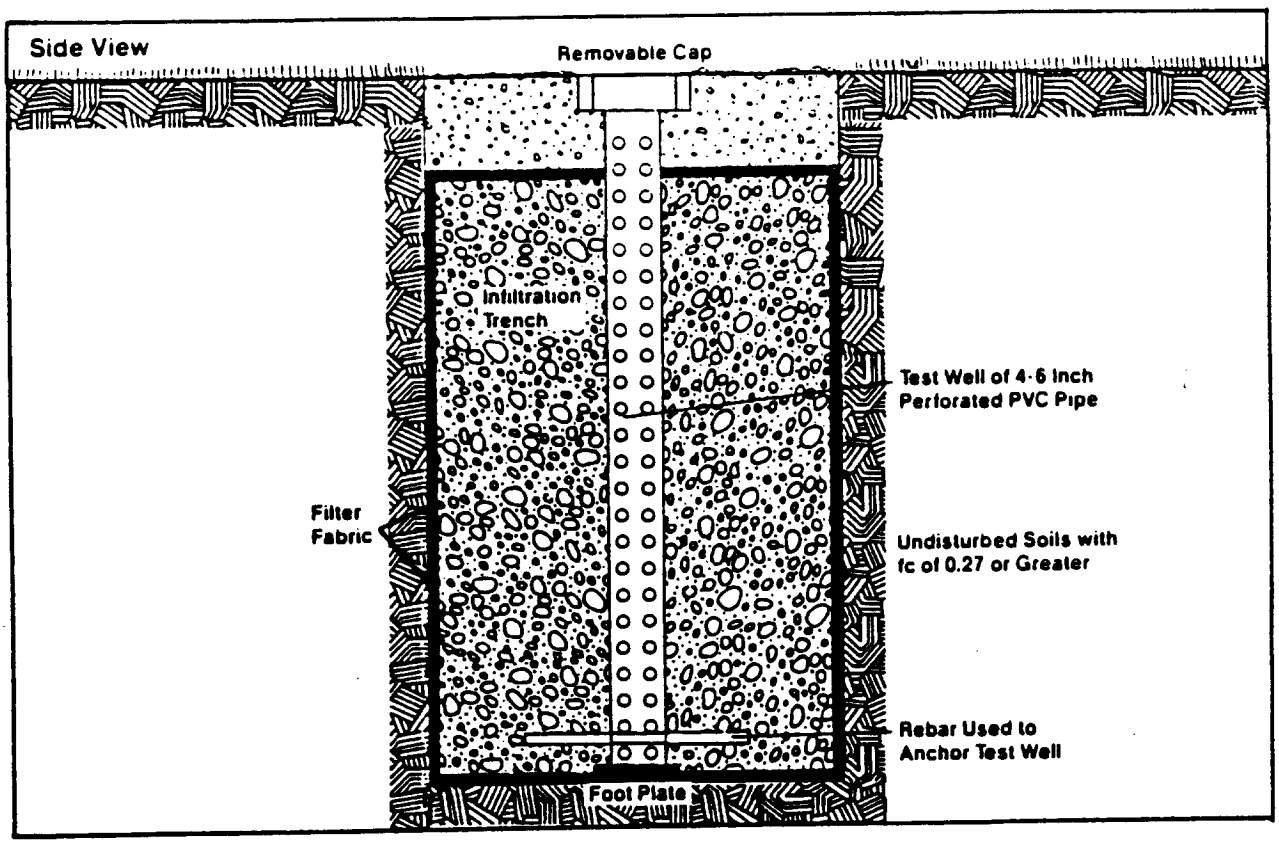
FIGURE 6-15

Detailed Schematic of a Typical Observation Well



Source: Schueler (1987)

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aggregates or the surface inlet should be monitored on the same schedule as the observation well. Sediment deposited shall not be allowed to build up to the point where it will significantly reduce the rate of infiltration into the trench.

Overflow: Unless the facility is designed to accommodate the total amount of anticipated runoff from a large design storm, some provisions should be made for overflow. In order to have maximum benefit in reducing downstream flood peaks, these structures should be designed to overflow before the total storage capacity is reached. There are many ways to accomplish this. Pipes can be used, for instance, to connect a sequence of infiltration facilities so that when the first one fills, it passes water through to the next one, and so on. Generally, several smaller facilities are more effective than one large one, though the latter may be necessary when there are space limitations. The capacity and cost of overflow discharge systems can be reduced by allowing temporary storage space above the infiltration trenches.

Because of the small drainage areas controlled by the exfiltration trench, an emergency spillway usually is not necessary. In all cases, however, the overland flow path of any surface runoff exceeding the capacity of the trench should be evaluated to preclude the development of an uncontrolled, erosive watercourse.

Seepage Analysis and Control

An analysis shall be made to determine any possible adverse effects of seepage zones when there are nearby building foundations, roads, parking lots or sloping sites. Developments on sloping sites often require the use of extensive cut and fill operations. The use of infiltration trenches on fill sites with steep slopes is not recommended. Fill areas can be very susceptible to slope failure due to slippage along the interface of the in-situ soil and the fill material. This condition could be further aggravated if the fill material is allowed to become saturated using retention practices. The methods for seepage analysis and estimation of infiltration rates using Darcy's law and flow nets can be used to conduct the seepage analysis.

When exfiltration trenches are used in residential areas, special care must be taken to prevent seepage from causing unstable soil conditions near foundations. Trenches three or more feet deep shall be located at least 10 feet down gradient from foundation walls.

Maintenance

Preventive maintenance is vital to the continued effectiveness of infiltration facilities. The use of pretreatment measures to filter out

suspended materials that might clog the facilities is necessary because once void areas become clogged, maintenance entails a complete replacement of the filler material. The use of filter fabrics over the surface of an infiltration trench that is open to the surface for runoff can be most effective in keeping objectionable material from entering the facility. Of course, periodic cleaning or replacement of clogged filter fabric will be necessary.

Routine Maintenance

The routine maintenance requirements of trenches are not great. However, getting property owners to actually perform them may be very difficult. Trenches are smaller and more inconspicuous than most other BMPs, and when located underground, they may not be visible or accessible. As a result, residents or homeowner associations are not likely to exhibit much concern over trench maintenance as they might for more visible BMPs, such as detention ponds. For these reasons, a public sector commitment to regularly inspect privately owned trenches is a necessity. Property owners and associations will need to be educated about the function and maintenance requirements of the trench. A legally binding maintenance agreement should be included with the property deed that clearly describes maintenance tasks and schedules. Further, the agreement should grant access for regular inspections, and enable the public sector to perform maintenance (and bill the owners) if the trench has been neglected. Some of the normal maintenance tasks for trenches are detailed below.

Inspection

The trench should be inspected several times in the first year of operation, and at least annually thereafter. The inspections should be conducted after large storms to check for surface ponding that might indicate local or wide spread clogging. Water levels in the observation well should be recorded over several days to check trench drainage. Surface trenches can be inspected by hand by digging with a trowel down to the first layer of filter fabric located one foot below the surface.

Buffer Maintenance

The condition of the grass buffer strips used in conjunction with trenches should be inspected regularly. Growth should be vigorous and dense. Bare spots, or eroded areas, should be reseeded or re-sodded. Watering and/or fertilization should be provided during the first few months after the strip is established, and may periodically be needed in times of drought.

Mowing

Grass filter strips should be mowed regularly to prevent the uncontrolled growth of briars and weeds which make inspections difficult, as well as,

reduce aesthetic values. Filter strips in residential or commercial areas will need to be mowed more frequently (10 to 14 times per year). Filter strip performance will be impaired if the grass is cut too short. To prevent lawn clippings from clogging the trench, mowers should be equipped with baggers.

Sediment Removal

The pre-treatment inlets of underground trenches should be checked periodically and cleaned out when sediment depletes more than 10% of available capacity. This can be done manually or by a vacuum pump. Inlet and outlet pipes should be checked for clogging and vandalism.

Tree Pruning

Adjacent trees may need to be trimmed if their branches extend over a surface trench such that falling leaves would be likely clog the grate or top of the facility. In addition, pioneer trees that start to grow in the vicinity of a trench should be removed immediately thereby avoiding root puncture of the filter fabric through which sediment might enter the structure.

Non-Routine Maintenance

The primary non-routine maintenance task involves rehabilitation of the trench after it becomes clogged. There is no reliable estimate as to how long trenches will function before they clog. Emphasis throughout this chapter has been on designs and procedures which minimize the likelihood of clogging. However, it is probable that the longevity of trenches may be on order of ten years at best.

Clogging in surface trenches is most likely to occur near the top of the trench, between the upper layer of stone and the protective layer of filter fabric. Surface clogging can be relieved by carefully removing the top layer of stone, removing the clogged filter fabric, installing new filter fabric, and cleaning or replacing the top stone layer. The costs for rehabilitating a surface trench would usually not be expected to exceed 20% of the initial construction cost.

Clogging of underground trenches is a much more serious problem as it is likely to occur at the bottom of the trench, at the filter fabric/soil interface. Rehabilitation of an underground trench requires the removal of the pavement or the topsoil/vegetation layer, the protective plastic layer, the stone aggregate, and the bottom filter fabric layer. Then, the subsoil layer must be tilled to promote better infiltration, and each layer must be replaced. If pavement or concrete constitute the surface layer (instead of topsoil/grass), the rehabilitation effort becomes more difficult and costly.

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Total Maintenance Costs

No reliable data is presently available to assess maintenance costs for trenches. Routine maintenance costs will probably run higher for surface trenches than underground trenches, primarily due to the frequency. As noted before, the opposite is probably true for non-routine maintenance tasks. It is reasonable to assume that the cost of rehabilitating an underground trench will be roughly equivalent to the initial construction cost. Surface trench rehabilitation should be approximately 20% of the initial construction cost; however, there are reasons to expect that the clogging of surface trenches may occur more frequently.

If it is assumed that surface and underground trenches will need rehabilitation every five to fifteen years, respectively, then an annual maintenance set-aside of 5% - 10% (surface trenches) and 10% - 15% (underground trenches) of the initial construction cost may be needed to cover routine/non-routine maintenance expenditures. It must be emphasized that these estimates are highly uncertain. Until more local experience is obtained, the issue of trench maintenance costs remains largely speculative.

SW BMP 3.04

SWALES USED FOR EROSION AND POLLUTION CONTROL

Definition

A) Swales or grassed waterways are natural or constructed conveyances shaped or graded to required dimensions and established in suitable vegetation for the safe disposal and treatment of runoff.

B) Chapter 403 F.S. and Chapter 17-25 F.A.C. further defines the term "swale" by requiring a cross-section with a top width to depth ratio of 6:1 or greater or side slopes of three horizontal to one vertical or flatter. In addition, these rules also specify that the conveyance must only contain standing or flowing water following a storm, be planted with or have stabilized vegetation, and be designed to prevent erosion and reduce pollutant concentration.

Historical Perspective and Purpose

A) "Grassed waterways" are used primarily for erosion control as safe outlets for conservation practices such as terraces in agricultural areas.

B) It is the usual practice to use existing topographic draws and rework when needed.

C) With slight modification, swales/waterways can be used for the treatment and removal of pollutants from stormwater runoff in urban situations.

Conditions Where Practice Applies

All sites where added capacity, vegetative protection or both are required to control erosion and/or reduce the pollutant load from concentrated stormwater runoff; and, where such control can be achieved by the use of this practice alone or in combination with others. Example uses include: as outlets for diversions and terraces; as conveyances to or outlets from surface and subsurface detention and filtration systems; to dispose of stormwater collected along roadways or discharged from residential areas; to rehabilitate or stabilize natural draws carrying concentrations of runoff to provide for or improve percolation and treatment of stormwater; and as pretreatment practices to reduce stormwater pollutant loads before conveying stormwater to other management practices.

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Typical Residential Roadside Swale with
Drop Inlet Slightly Raised for Storage



Fringing Swale to Provide Pretreatment of Runoff
Entering a Stormwater Detention Pond or Lake

Planning Considerations

The grass-lined waterway or swale is one of the basic conservation practices historically used by farmers. When rainfall exceeds the rate or volume at which the soil can take in and store moisture, surplus water will pass over the land in the form of runoff. In agricultural areas this practice is primarily intended for removal of this surplus water without undue erosion or flooding. Conventional agricultural waterways can be slightly modified to slow the runoff velocity such that sedimentation, filtration of the runoff through vegetation, and percolation can take place thereby allowing swales to provide stormwater treatment in urbanizing watersheds.

Generally the use of swales is limited to slopes of less than 10% and drainage areas of less than 150 acres (60 hectares). Design and engineering problems can be expected where the velocity or the volume of discharge is too great so as to cause erosion or limit pollutant removal via sedimentation, vegetative filtration, and/or percolation. In these circumstances the gradient may be reduced and/or pollutant removal capability improved by the introduction of spillways, check dams, elevated driveway culverts, or other control structures designed to reduce the velocity between each section of the waterway, making the grass lining more feasible and increasing the time for percolation.

To be effective in removing stormwater pollutants, swales must not be subjected to low flows of long duration nor kept wet for long periods. This will kill the vegetation and saturate the soil reducing pollutant removal. A tile drain beneath the channel or other means of providing drainage and protecting the center of the waterway should be considered when planning and designing swales for sites where a high water table or seepage problems are expected.

The successful swale system is dependent on good stormwater treatment throughout its watershed. Good management practices reduce the peak rate of runoff and the volume of water to be carried, percolated, or filtered by the waterway. The swale should be protected by using a combination of the following steps depending on what best fits the needs of the site:

- Construct the waterway in advance of any other channels or facilities that will discharge into it.
- Divert all flow from the waterway during the establishment period.
- Establish the vegetative cover according to recommended techniques. See TEMPORARY SEEDING (ES BMP 1.65), PERMANENT SEEDING (ES BMP 1.66) and SODDING (ES BMP 1.67).
  - Protect the channel seeding with mulch (manure, stubble,

straw, jute netting, or wired and staked mulch).

- Sod the channel.

- Use a portable or temporary sprinkler line to irrigate the new seeding or sodding to ensure and hasten establishment.

° Reduce the required capacity by dividing the runoff between two or more outlets when needed.

° Use stable natural topographic conveyances where possible.

° Maintain vegetative cover by mowing and performing other maintenance work as needed.

The most satisfactory location for a waterway is in a well vegetated natural draw. These locations should be used where possible since they have one or more of the following advantages:

° Flattest grade in the immediate area.

° Most stable channel conditions.

° Soil and moisture conditions most favorable to vegetative growth.

° Usually are available for immediate use.

° Sufficient depth for outletting diversions, terraces or other treatment facilities at grade.

The natural waterway into which the draw flows may need to be shaped, enlarged and stablized to accommodate the increased flow delivered to it. However, the natural waterway should not be altered without checking with the Department of Environmental Regulation to see whether a dredge and fill, stormwater or other permit will be required.

A grassed strip or border may be used in lieu of a constructed or natural channel. However, the surface of such areas should be checked to ensure that a uniform surface of adequate width is available to spread the flow, and that the type and density of vegetation is adequate to withstand the expected velocities and/or provide an adequate level of percolation for pollution control.

An area of land parallel to the project boundary is frequently used to provide an outlet for secondary conveyances that cannot be extended to a natural draw. In all cases the outlet should be away from buildings or other critical areas. The designer should always avoid the use of a gullied

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natural draw that would be impractical to control. Likewise, existing road ditches for the disposal of runoff water should be checked to ensure that they have adequate capacity. They should be avoided unless the channel is stable and in conformance with these design requirements, state regulations specified for this practice and overall stormwater treatment requirements.

Waterways are frequently planned where the slope is variable and where there is a wide difference in the watershed area at various points along the channel. In such cases, the waterway is designed in reaches. A reach is usually a portion of the channel having a near-uniform slope and drainage area. A point of significant break in slope is a point of division between two reaches. The point of entrance of a diversion or other tributary where the watershed area is significantly increased also may be a point of division between two reaches. Where there is a significant difference in velocity or capacity between adjoining reaches, it may be necessary to install a transition section between them.

Design Criteria

Design for conventional purposes involves calculating the peak runoff expected from a design storm (usually a ten year, 24-hour event) and checking the velocity and channel discharge capacity to ensure that erosion and flooding will be avoided.

Design for pollution control requires that the waterway also be capable of percolating a substantial amount of runoff. Therefore:

- Estimation of the percolation rate is critical to the design procedure.
- The state stormwater rule, FAC Chapter 17-25, requires that 80% of the three year, one-hour design storm be percolated.

Typical waterway shapes are illustrated in Figure 6-16.

Preliminary Design Needs or Basic Data

1) A survey must be performed to provide relevant watershed information for locating and sizing the waterway.

2) Information obtained should include drainage area or watershed boundaries of the contributory area, soil types, ground cover and slopes.

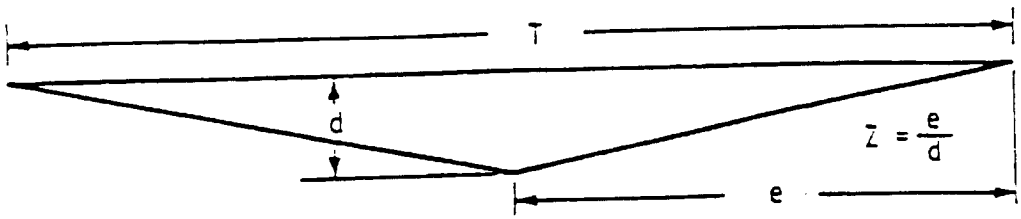
3) The original ground surface should be profiled in enough detail to permit dividing the waterway into reaches of uniform slope and shape.

FIGURE 6-16

Typical Waterway Shapes and Mathematical Expressions for Calculating Cross-sectional Area, Top Width, and Hydraulic Radius

CHANNEL GEOMETRY

V - Shape

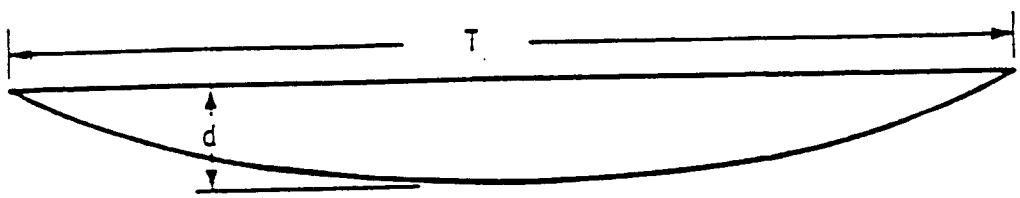


Cross-Sectional Area (A) = Zd^2

Top Width (T) = $2dZ$

Hydraulic Radius (R) = $\frac{Zd}{2\sqrt{Z^2 + 1}}$

Parabolic Shape

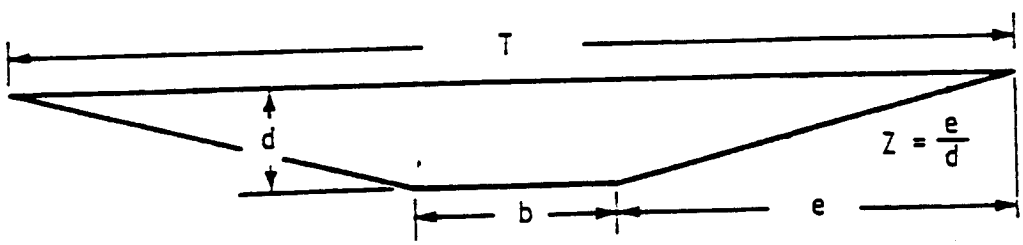


Cross-Sectional Area (A) = $\frac{2}{3}$ Td

Top Width (T) = $\frac{1.5\ A}{d}$

Hydraulic Radius = $\frac{T^2 d}{1.5T^2 + 4d^2}$

Trapezoidal Shape



Cross-Sectional Area (A) = $bd + Zd^2$

Top Width (T) = $b + 2dZ$

Hydraulic Radius = $\frac{bd + Zd^2}{b + 2d\sqrt{Z^2 + 1}}$

Source: USDA-SCS

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4) This survey should also provide data to enable the designer to determine the adequacy of the outlet or receiving stream into which the waterway discharges. Information should include tne slope and cross-sectional area of the receiving channel and notes of tne following:

   A) Irregularities of the channel cross-section (i.e., lack of uniformity)

   B) Obstructions

   C) Vegetation

   D) Meandering

   Adjustments should be made by the designer to account for such situations.

Example Design Procedure

The design of a swale involves sizing for erosion control and then checking to ensure adequate area is available for percolation to meet pollution control objectives.

Suppose a system of swales is needed for a 10 acre (660 ft. x 660 ft.) single family residential project with 1/4 acre lots. The site survey indicates that the soils are in hydrologic soil group B (e.g. Orangeburg). The pervious area consists of lawns in good condition, the slope is uniform at 3% (.03 ft/ft) and the project is located in Tallahassee. There are three streets which span this small development. Swales are planned to provide drainage and stormwater treatment on each side of all three streets.

Determine the size conveyance required to safely dispose of the ten year, 24-hour design storm without exceeding the channel capacity and the maximum permissible velocity for the type of vegetative lining. Assume the slope approximates that given for the project area and the ground cover desired is bermuda grass.

Step #1: **Determine the peak discharge expected from the ten year/recurrence interval design storm.**

Many methods are available to the engineer for estimating peak runoff as discussed in Chapter 5. The procedures developed by the Soil Conservation Service (SCS) for small watersheds up to 2000 acres would be suitable for the example above. The Rational or Runoff Coefficient Method is another, but only for small watersheds.

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Description

Step #

1-1: Determine the magnitude of rainfall associated with the design storm.

A) NOAA 24-hour maximum rainfall distribution charts are used in the SCS procedure (Figure 6-17).

B) FDOT Intensity Duration Frequency (IDF) Curves are used in application of the Rational Method (Figure 6-18). NOAA maps for different return periods and IDF charts for each zone of precipitation are included in Chapter 5.

When using the Rational Method for peak discharge calculations the designer must first determine the time of concentration (Tc) in hours. The storm duration which is viewed to produce the highest peak discharge of runoff is the duration equal to "Tc" otherwise known as the rainfall intensity averaging time. Procedures for calculating Tc are also presented in Chapter 5. For this example assume the time of concentration (Tc) expected after development is approximately 18 minutes or 0.30 hours.

Example Question: Given that the project is located in Tallahassee, what is the magnitude and intensity (I) of precipitation (P) associated with the ten year design event?

Answer: P = 7.5 in. based on the NOAA map.
I = 6.0 in./hr. based on the FDOT Intensity-Duration Frequency curve for Zone 2/and Tc = 18 min. = duration

1-2: **Determine the SCS curve number (CN) or the rational coefficient (C).**

Tables of both CN and C can be found in many references and manuals. Table 6-5 lists a range of CN's for various land use types and hydrologic soil groups (HSG's). Table 5-1 found in the preceding chapter lists appropriate values for the coefficient of runoff (C) for various land cover classes.

Problem: Using Table 6-5 and 5-1 determine the Curve Number and the Runoff Coefficient for the project described previously. Assume average antecedent moisture condition II; Orangeburg = HSG-B for estimating CN.

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FIGURE 6-17

NOAA Rainfall Map of Florida
Showing the 10 Year-24 Hour Storm Rainfall (inches)

[FOR ILLUSTRATION ONLY]

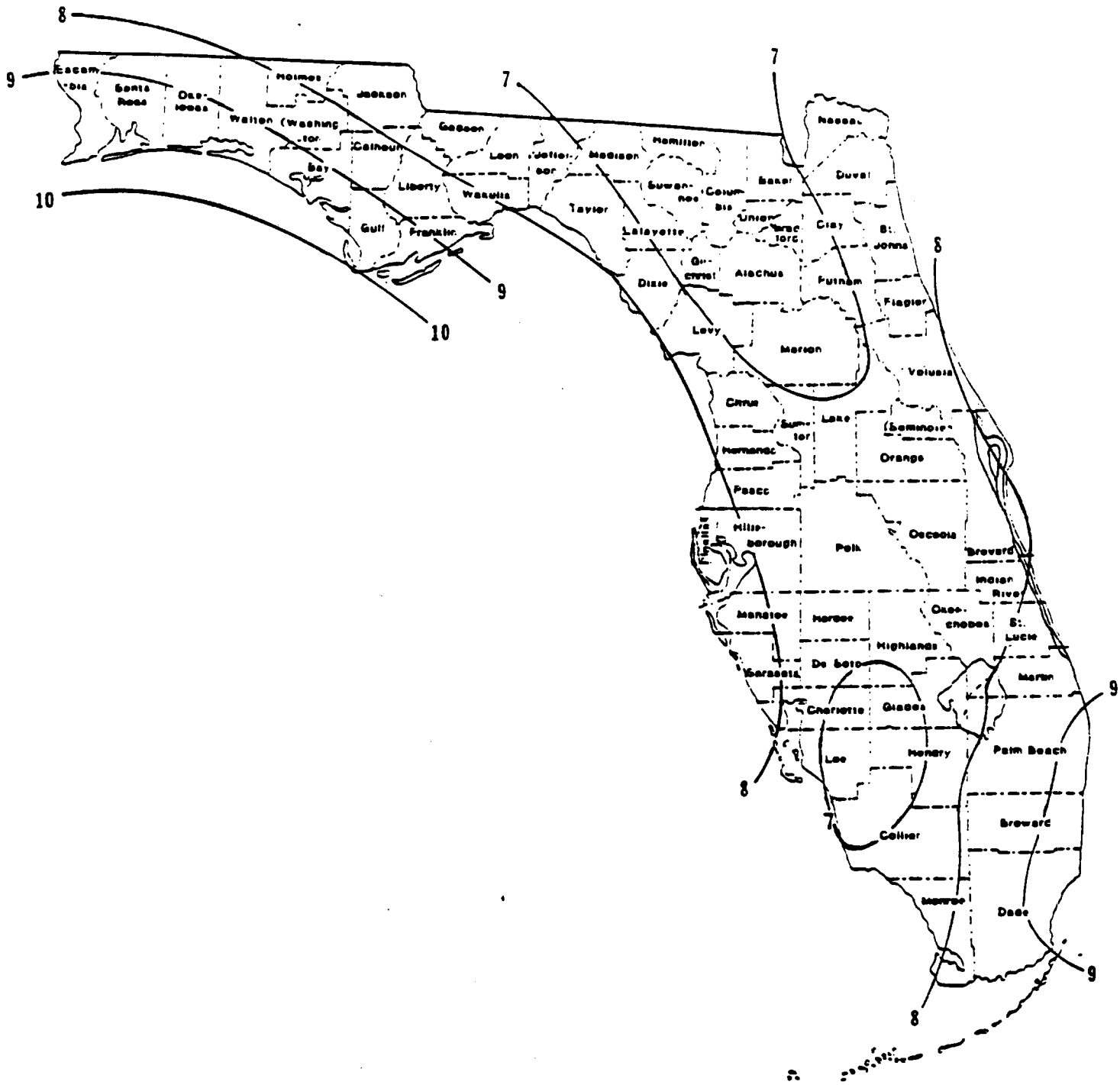

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FIGURE 6-18

FDOT Rainfall Intensity-Duration Frequency Chart for Tallahassee

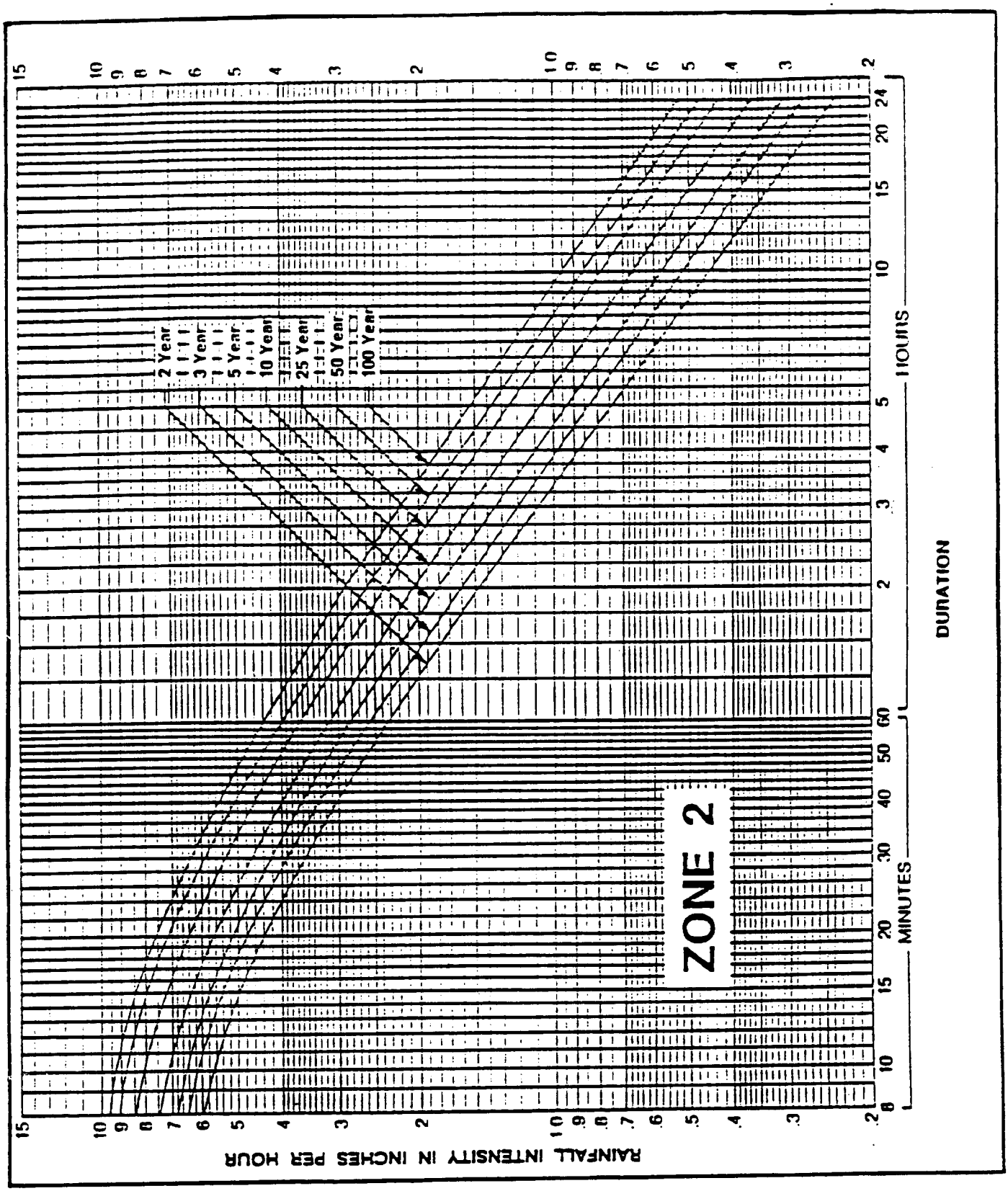

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TABLE 6-5

Runoff Curve Numbers for Selected Land Uses[1]

COVER DESCRIPTION		CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP			
COVER TYPE AND HYDROLOGIC CONDITION	AVERAGE PERCENT IMPERVIOUS AREA[2]	A	B	C	D
Fully developed urban areas (vegetation established)					
Open space (lawns, parks, golf courses, cemeteries, etc.)[3]:					
Poor condition (grass cover < 50%)	.....	68	79	86	89
Fair condition (grass cover 50% to 75%)	.....	49	69	79	84
Good condition (grass cover > 75%)	.....	38	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)	.....	98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)	.....	98	98	98	98
Paved; open ditches (including right-of-way)	.....	83	89	92	93
Gravel (including right-of-way)	.....	76	85	89	91
Dirt (including right-of-way)	.....	72	82	87	89
Urban districts:					
Commercial and business	 85	89	92	94	95
Industrial	 72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	 65	77	85	90	92
1/4 acre	 38	61	75	83	87
1/3 acre	 30	57	72	81	86
1/2 acre	 25	54	70	80	85
1 acre	 20	51	68	79	84
2 acres	 12	46	65	77	82
Developing urban areas					
Newly graded areas (pervious areas only, no vegetation)	.....	77	86	91	94
Idle lands (CN's are determined using cover types similar to those below)					
Pasture, grassland, or range:					
Poor (<50% ground cover or heavily grazed)	.....	68	79	86	89
Fair (50% to 75% ground cover and not heavily grazed)	.....	49	69	79	84
Good (> 75% ground cover and lightly or only occasionally grazed)	.....	39	61	74	80
Meadow - continuous grass, protected from grazing and generally mowed for hay:	.....	30	58	71	78

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TABLE 6-5 (CONTINUED)

Runoff Curve Numbers for Selected Land Uses[1]

COVER DESCRIPTION		CURVE NUMBERS FOR HYDROLOGIC SOIL GROUP			
COVER TYPE AND HYDROLOGIC CONDITION	AVERAGE PERCENT IMPERVIOUS AREA[2]	A	B	C	D
Brush-brush-weed-grass mixture with brush the major element:					
Poor (<50% ground cover)	.....	48	67	77	83
Fair (50% to 75% ground cover)	.....	35	56	70	77
Good (>75% ground cover)	.....	30	48	65	73
Woods - grass combination with 50% woods and 50% grass (pasture) cover. Other combinations of conditions may be computed from the CN's for woods and pasture:					
Poor	.....	57	73	82	86
Fair	.....	43	65	76	82
Good	.....	32	58	72	79
Woods:					
Poor (Forest litter, small trees, and brush are destroyed by heavy grazing or regular burning)	.....	45	66	77	83
Fair (Woods are grazed but not burned and some forest litter covers the soil	.....	36	60	73	79
Good (Woods are protected from grazing and litter and brush adequately cover the soil)	.....	30	55	70	77

[1]Average runoff condition, and $I_a = 0.2s$.

[2]The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions must be computed.

[3]CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.

(Source: USDA. Soil Conservation Service, TR-55, Second Ed., June 1986)

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Solution: CN = 75

C = 0.30-0.50 (Single Family Residental Areas)

Larger more complex areas or watersheds require the designer to determine a weighted average CN. In the example below, the curve numbers shown are for hydrologic soil group C. This information is presented to illustrate the averaging procedure. The resulting value is not intended for use in the sequence of example problems which follow. CN = 75 will be used in these instances.

LAND USE	PERCENT	CURVE NUMBER	PRODUCT
Detached houses with lot size 1/4 acre	50	83	4,150
Streets with curbs, plazas, etc.	25	98	2,450
Townhouses with lot size 1/8 acre	10	90	900
Open space, parks, etc.	15	74	1,110
	100		8,610

Weighted CN = $\frac{8,610}{100}$ = 86

1-3: **Determine the depth of runoff** by using Table 6-6 which lists the solution to the SCS runoff equation for a range of CN's and rainfall amounts. Given that rainfall equals 7.5 inches and the Curve Number equals 75, what is the total amount of runoff (RO) expected?

Answer: (RO) = 4.6 in.

1-4: **Determine the maximum discharge expected from the design storm.**

A) When using the Rational Method the peak discharge is calculated according to the following equation:

$$Qp = CiA$$

The appropriate input value for the rainfall intensity (i = 6.0 in./hr.) and the range of the runoff coefficient (C - 0.30 - 0.50) was specified in step 1-1 and 1-2 of this example. Be conservative in selecting (C). In this case presume that C = 0.50.

TABLE 6-6

RUNOFF DEPTH IN INCHES FOR SELECTED CN'S AND RAINFALL AMOUNTS

Rainfall	40	45	50	55	60	65	70	75	80	85	90	95	98
inches													
1.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.08	0.17	0.32	0.56	0.79
1.2	.00	.00	.00	.00	.00	.00	.03	.07	.15	.27	.46	.74	.99
1.4	.00	.00	.00	.00	.00	.02	.06	.13	.24	.39	.61	.92	1.18
1.6	.00	.00	.00	.00	.01	.05	.11	.20	.34	.52	.76	1.11	1.38
1.8	.00	.00	.00	.00	.03	.09	.17	.29	.44	.65	.93	1.29	1.58
2.0	.00	.00	.00	.02	.06	.14	.24	.38	.56	.80	1.09	1.48	1.77
2.5	.00	.00	.02	.08	.17	.30	.46	.65	.89	1.18	1.53	1.96	2.27
3.0	.00	.02	.09	.19	.33	.51	.71	.96	1.25	1.59	1.98	2.45	2.77
3.5	.02	.08	.20	.35	.53	.75	1.01	1.30	1.64	2.02	2.45	2.94	3.27
4.0	.06	.18	.33	.53	.76	1.03	1.33	1.67	2.04	2.46	2.92	3.43	3.77
4.5	.14	.30	.50	.74	1.02	1.33	1.67	2.05	2.46	2.91	3.40	3.92	4.26
5.0	.24	.44	.69	.98	1.30	1.65	2.04	2.45	2.89	3.37	3.88	4.42	4.76
6.0	.50	.80	1.14	1.52	1.92	2.35	2.81	3.28	3.78	4.30	4.85	5.41	5.76
7.0	.84	1.24	1.68	2.12	2.60	3.10	3.62	4.15	4.69	5.25	5.82	6.41	6.76
8.0	1.25	1.74	2.25	2.78	3.33	3.89	4.46	5.04	5.63	6.21	6.81	7.40	7.76
9.0	1.71	2.29	2.88	3.49	4.10	4.72	5.33	5.95	6.57	7.18	7.79	8.40	8.76
10.0	2.23	2.89	3.56	4.23	4.90	5.56	6.22	6.88	7.52	8.16	8.78	9.40	9.76
11.0	2.78	3.52	4.26	5.00	5.72	6.43	7.13	7.81	8.48	9.13	9.77	10.39	10.76
12.0	3.38	4.19	5.00	5.79	6.56	7.32	8.05	8.76	9.45	10.11	10.76	11.39	11.76
13.0	4.00	4.89	5.76	6.61	7.42	8.21	8.98	9.71	10.42	11.10	11.76	12.39	12.76
14.0	4.65	5.62	6.55	7.44	8.30	9.12	9.91	10.67	11.39	12.08	12.75	13.39	13.76
15.0	5.33	6.36	7.35	8.29	9.19	10.04	10.85	11.63	12.37	13.07	13.74	14.39	14.76

INTERPOLATE THE VALUES SHOWN TO OBTAIN RUNOFF DEPTHS FOR CN'S OR RAINFALL AMOUNTS NOT SHOWN.

(SOURCE USDA. SOIL CONSERVATION SERVICE, TR-55, SECOND ED., JUNE 1986)

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Substituting tne values for "C" and "i" into tne equation, this (10-acre) project would be estimated to have the following associated peak discharge:

Qp = 0.50 x 6 in./hr. x 10 ac = 30 cfs
(Note: 1 ac.in./hr. = 1 cfs)

However, this value would be divided uniformily among each of the six swale systems serving the project. The designer may proceed to step #2 at this point.

B) If using the SCS procedure the designer must first determine the unit peak discharge (UPD) expected from the design storm. The most simple and easily derived projections may be accomplished by using Figure 6-19. This graphical solution to predictive equations for peak discharge was developed by the SCS to calculate the unit peak discharge for uniform watersheds where the runoff can be represented by one curve number.

The input requirements for the Graphical Method are as follows:

1) Time of concentration "Tc" (hrs.)

2) Drainage area (sq. mi.)

3) Appropriate rainfall distribution (Type I, IA, II, or III)

4) The 24-hour rainfall (inches); and

5) Curve Number (CN)

If pond and swamp areas are spread throughout the watershed and are not considered in the Tc computation, an adjustment for pond and swamp areas is also needed.

In this example the value of Tc = 0.30 hours was determined in step 1-1B. The drainage area of ten acres (previously specified) must be converted to square miles. The appropriate rainfall distribution may be determined based on the geographic boundaries shown on Figure B-2 of TR-55 (SCS, 1986). In this instance the location (Tallahassee, Leon County) lies along the boundary for the Type III rainfall distribution. The 24-hour rainfall value (P = 7.5 inches) was specified in the example for step 1-1(b). Lastly, the curve number (CN = 75) was previously established during step 1-2.

To use Figure 6-19, the designer must first determine the initial abstraction (Ia) from Table 6-7 based on the curve number. The decimal ratio Ia/P is then computed.

TABLE 6-7

I_a Values for Runoff Curve Numbers

CURVE NUMBER	I_a (IN)	CURVE NUMBER	I_a (IN)
40	3.000	70	0.857
41	2.878	71	0.817
42	2.762	72	0.778
43	2.651	73	0.740
44	2.545	74	0.703
45	2.444	75	0.667
46	2.348	76	0.632
47	2.255	77	0.597
48	2.167	78	0.564
49	2.082	79	0.532
50	2.000	80	0.500
51	1.922	81	0.469
52	1.846	82	0.439
53	1.774	83	0.410
54	1.704	84	0.381
55	1.636	85	0.353
56	1.571	86	0.326
57	1.509	87	0.299
58	1.448	88	0.273
59	1.390	89	0.247
60	1.333	90	0.222
61	1.279	91	0.198
62	1.226	92	0.174
63	1.175	93	0.151
64	1.125	94	0.128
65	1.077	95	0.105
66	1.030	96	0.083
67	0.985	97	0.062
68	0.941	98	0.041
69	0.899		

In this example the value (I_a/P = .67/7.5 or 0.09) is outside the range of curves included with Figure 6-18. Consequently, the graph (I_a/P = .10) should be used.

The unit peak discharge per square mile per inch of runoff is obtained from Figure 6-18 by using T_c = 0.30 hrs., rainfall distribution type

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III, and I_a/P ratio = .10. Assume that ponding is not a factor in the watershed following development. Select the appropriate Tc (0.3 hrs.) and proceed vertically up the chart to where the line crosses the curve (Ia/P = .10), then read the value of discharge recorded on the left. Note that the units are in cfs/square mile of drainage area/inch of runoff (csm/in.).

Unit Peak Discharge (UPD) = 500 csm/in.(approximately).

C) To calculate total peak discharge, convert acreage of the project to square miles (mi^2).

Note: $\frac{\text{Acreage}}{640} = mi^2$, therefore, $\frac{10 \text{ Ac.}}{640 \text{ Ac/mi}^2} = 0.016 \text{ mi}^2$

Determine total discharge by using the following equation:

mi^2 x RO (in.) x UPD ($cfs/mi^2/in.$)=Total Peak Discharge (cfs)

Total Peak Discharge = 37 cfs.

This value represents the minimum design discharge capacity for a single waterway at the outlet. However, in regard to each lateral, the drainage is to be evenly divided between six swales each 660 ft. long. Consequently each reach must be capable of handling only 6.2 cfs without exceeding the erosive velocity.

Step #2

Both the capacity of the channel and the velocity of flow are functions of the channel lining, its cross-sectional area, and its slope. The task of the designer is to determine a channel section and lining which will have sufficient discharge capacity and be stable for a given slope.

Two equations are used to calculate the flow in open channels. They are:

(1) Manning's Equation, $V = \frac{1.49}{n} R^{2/3} S^{1/2}$

Where,

V = the average velocity in the channel (ft/sec)
n = Manning's roughness coefficient, based upon the lining of the channel
R = the hydraulic radius (ft)
S = the slope of the channel (feet/foot)

(2) Continuity Equation, $Q = AV$

Where,

Q = flow in the channel (ft^3/sec)
A = cross-sectional area of the channel (ft^2)
V = average velocity in the channel (ft/sec)

Manning's Equation and the Continuity Equation are used simultaneously to determine flow capacity and velocity in the channel. The methodology is suitable for determining a cross-section and lining for straight, uniform channel reaches with a constant slope.

The following is a step-by-step procedure for designing a stormwater conveyance channel using the Manning's and Continuity Equations:

Step #	Description

2-1: Select a channel cross-section shape and lining and determine the slope.

A) Select a Channel Cross-Section: The three most commonly used channel cross-sections are vee, parabolic, and trapezoidal shapes. Figure 6-11 gives mathematical formulas for determining the area, hydraulic radius and top width of these shapes. Parabolic shapes are the most common and generally are the most satisfactory. It is a more natural shape and low flows are less likely to meander. Trapezoidal sections tend to revert to parabolic sections over time. For this exercise assume that the designer has selected a parabolic shape cross-section.

B) Select a Channel Lining: For design purposes, erosion resistance is a function of flow velocity in the channel. There are a number of possible linings to choose from. Commonly used channel linings include grass, riprap and concrete.

Concrete and similar structural linings generally do not erode and their design is not restricted by maximum permissable flow velocities. However, these areas cannot be counted as a part of the functional treatment component of a swale since they lack capacity for pollutant removal. Riprap and grass-lined channels do have maximum permissible velocities beyond which they will erode. It was specified earlier that the lining selected would be bermuda grass.

C) Determine Channel Slope: The slope of the channel is generally fixed by the topography and proposed route of the channel. However, slope modification may often need to be considered to allow greater percolation to meet pollution control objectives.

The slope was noted earlier to be 3% (i.e., .03 feet/foot).

Therefore:

A parabolic waterway with a bermuda grass lining and a 3% slope represents the design conditions.

2-2: Determine the maximum permissible velocity (V) for the grass to be used (Table 6-8). Enter the table in the appropriate slope category (0-5%) and read the maximum rate recorded opposite the type of cover or lining to be used (bermuda).

Permissible Velocity (V) = 6 ft/sec

2-3: Determine an initial channel size (area (A), top width (T), and depth (d). Initial estimates of the cross-sectional area follows:

A = Q/V or 6.2 cfs/6 (ft/sec)

A = 1.03 ft^2

However, an area larger than 1.0 ft^2 should be assumed initially since the capacity and velocity will be calculated with different roughness coefficients. Try A = 2 square feet.

To complete the evaluation the designer must also specify the top width (T) and depth (d) of the conveyance. Assume an initial top width. In this case try T = 4 ft. The depth (d) can be determined from equations listed on Figure 6-16. Use the information listed for parabolic shapes.

$T = \frac{1.5\ A}{d}$ Therefore: $d = \frac{1.5\ A}{T}$

In this case d = 0.75 ft

To be in compliance with state stormwater treatment criteria outlined in 17-25 F.A.C., parabolic and "V" shaped swales must have a top width to

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oth ratio of 6:1 or larger. Therefore, if the designer desires to hold e top width (T = 4 ft), the depth (d = 8 in.) must be used to satisfy ate criteria.

Given these dimensions then:

$$A = 2/3\ Td = 1.8\ ft^2$$

2-4: Calculate the hydraulic radius (R) of the channel (e.g. cross-sectional area divided by the wetted perimeter). Equations are listed with Figure 6-16.

$$\text{Hydraulic Radius } (R) = \frac{T^2 d}{1.5\ T^2 + 4d^2}$$

$$R = \frac{(4)^2\ (0.67)}{1.5\ (4)^2 + 4\ (0.67)^2} = \frac{10.72}{25.80}$$

$$R = \underline{0.42}\ ft$$

2-5: Use Table 6-9 and Figure 6-20 to determine n. Assume a retardance Class B for calculating capacity and a retardance Class D for checking velocity.

Note that in using Figure 6-20 you must first determine the product of the permissible velocity and hydraulic radius (R).

$V \times R = 6\ fps \times 0.42\ ft = \underline{2.52}\ ft^2/sec$
$n = \underline{0.087}$ (retardance Class B for checking capacity)
$n = \underline{0.043}$ (retardance Class D for checking velocity)

2-6: Check capacity against required discharge capacity determined in Step 1-4.

$$Q = \frac{1.49}{n} (R)^{2/3} (S)^{1/2} A$$

$$= \frac{1.49}{0.087} (0.42)^{2/3} (0.03)^{1/2} (1.8)$$

$Q = \underline{3.0}$ cfs, which is less than 6.2 cfs required.

2-7: Check velocity against permissible velocity (6 ft/sec)

$$V = \frac{1.49}{n} (R)^{2/3} (S)^{1/2}$$

$$= \frac{1.49}{0.043} (0.42)^{2/3} (0.03)^{1/2}$$

$$= 3.4\ ft/sec$$

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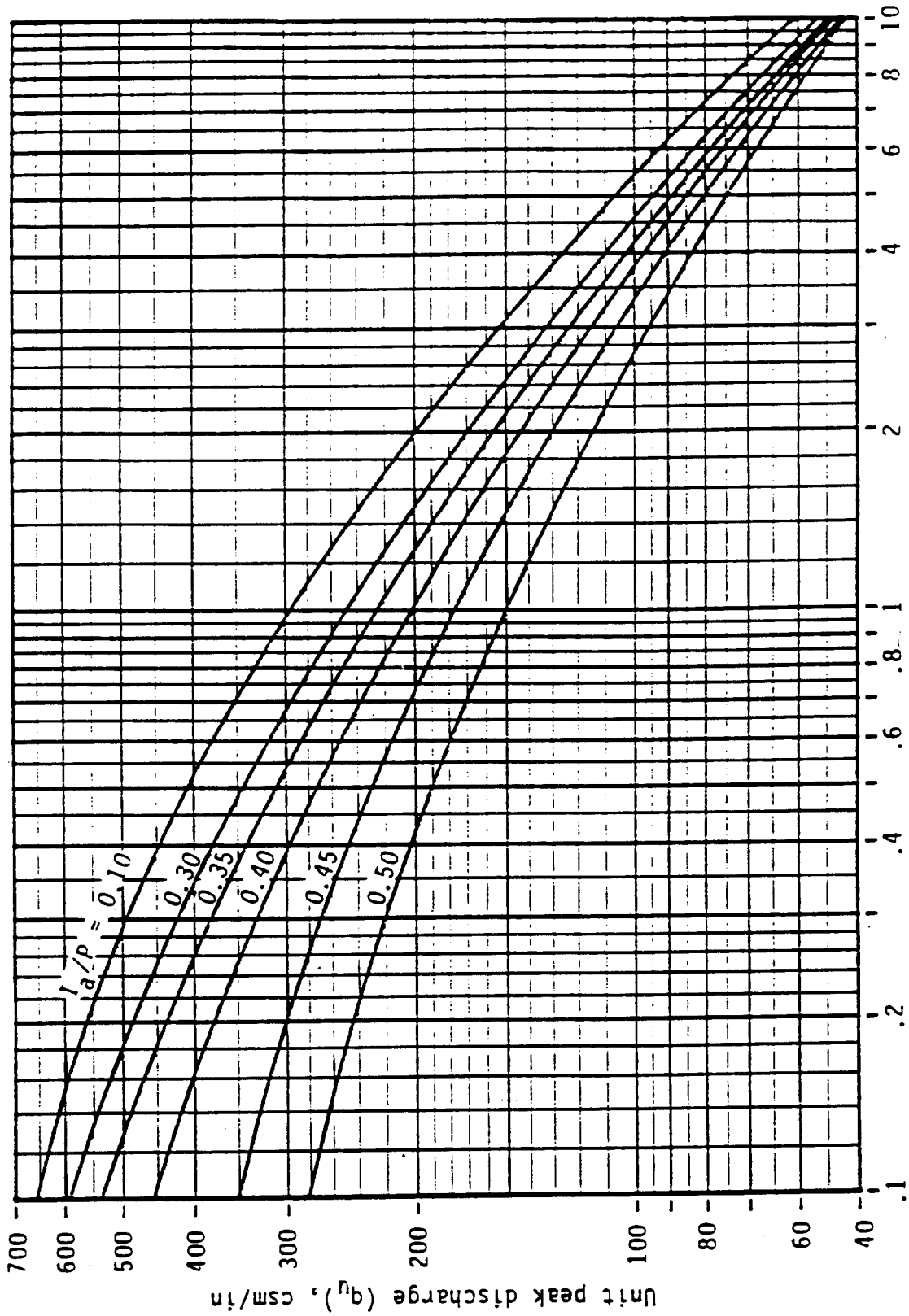
UNIT PEAK DISCHARGE FOR SCS TYPE III RAINFALL DISTRIBUTION



Source: SCS., TR-55, Second Ed., June 1986

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TABLE 6-8

PERMISSIBLE VELOCITIES GRASS-LINED CHANNELS

CHANNEL SLOPE	LINING	PERMISSIBLE VELOCITY
0-5%	Bermudagrass	6 ft/sec
	Bahia	5 ft/sec
	Bluestem (broomsedges)	5 ft/sec
	Grass-legume mixture	4 ft/sec
	Sericea lespedeza	2.5 ft/sec
	Annual lespedeza	2.5 ft/sec
	Small grains (temporary)	2.5 ft/sec
5-10%	Bermudagrass	5 ft/sec
	Bahia	4 ft/sec
	Bluestem (broomsedges)	4 ft/sec
	Grass-legume mixture	3 ft/sec

TABLE 6-9

CLASSIFICATION OF VEGETATION COVER AS TO DEGREE OF RETARDANCE

RETARDANCE CLASS	COVER	CONDITION
A	Bluestem (broomsedges)	Excel. stand, tall (average 36")
B	Bermudagrass or Bahia	Good stand tall (average 12")
	Native grass mixture (bluestem, vasey grass and other long and short wet prairie grasses)	Good stand, unmowed
	Lespedeza sericea	Good stand, not woody, tall (average 19")
C	Bahia	Good stand, uncut (6-8")
	Bermuda grass	Good stand, mowed (average 6")
	Centipede grass or St.Augustine	Very dense cover (average 6")
D	Bermudagrass or Bahia	Good stand, cut to 2.5" height
	Lespedeza sericea	After cutting to 2" height. Very good stand before cutting.
E	Centipede grass or St. Augustine	Good stand, cut to 1.5" height

Source: USDA SCS-FL

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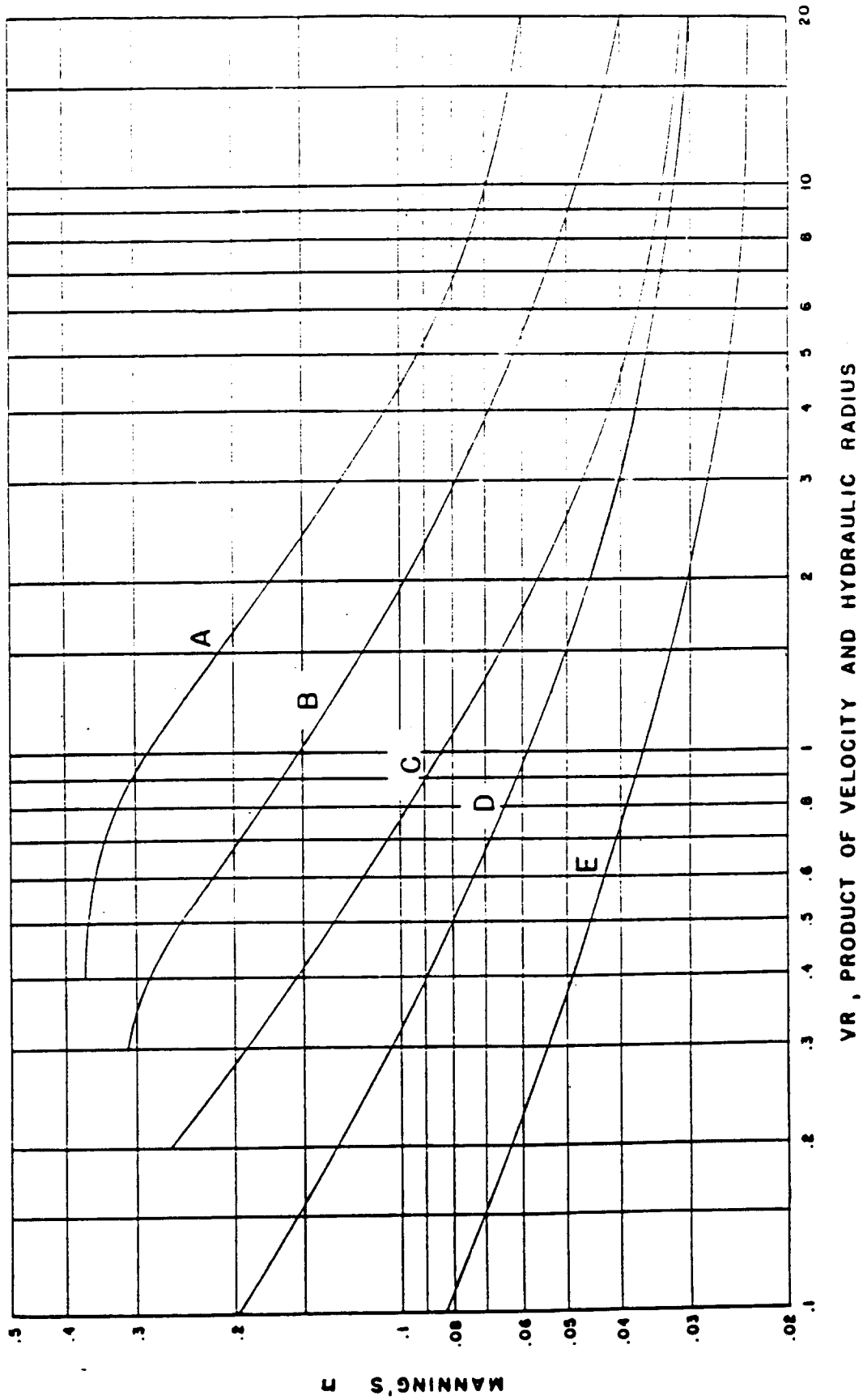
FIGURE 6-20

Manning's "n" Related to Velocity, Hydraulic Radius, and Vegetal Retardance
(Source: USDA., SCS - FL)



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$$V = \frac{3.4}{} \text{ ft/sec}$$

In this case the permissible velocity (6 ft/sec) is not exceeded but the swale must be redesigned since it will not have the required conveyance capacity.

Try a new parabolic cross-section with a top width of 6 ft. and a depth of 1.0 ft.

Return to Step 2-4.

$$R = \frac{T^2 d}{1.5T^2 + 4d^2} = \frac{36}{(1.5)(36) + 4(1)^2} = \frac{36}{58} = .62$$

Proceed to Step 2-5

$V \times R = 6 \times .62 = 3.72$
$n = .072$ (for retardance Class B)
$n = .038$ (for retardance Class D)

Recheck capacity as in Step 2-6.

$$Q = \frac{1.49}{n} (R)^{2/3} (S)^{1/2} A$$

New $A = 2/3\ Td = 2/3\ (6)(1) = 4.0$ sq. ft.

$$Q = \frac{1.49}{.072} (.62)^{2/3} (.03)^{1/2} (4/0)$$

Q = 10.4 cfs which is greater than 6.2 cfs required capacity

Recheck permissible velocity

$$V = \frac{1.49}{.038} (.73) (.17)$$

= 4.9 ft/sec which is less than 6 fps

Final swale design for erosion control is a parabolic cross section that is 1 ft. deep and with a 6 ft. top width.

Channel dimensions may also be determined using procedures and charts for waterways outlined in Chapter 7 of the Soil Conservation Service Engineering Field Manual. A discussion of these SCS procedures and the appropriate tables and figures may be found in Appendix 6-4 at the end of this chapter.

Step #3

As required by Chapter 17-25, once the conveyance has been sized to safely transport the required flow of water, the design must be checked to determine the swale's ability to percolate water.

Several studies conducted by the University of Central Florida for the Florida Department of Transportation document the importance of percolation as the primary mechanism for pollutant removal in roadside swale areas. Other research by the United States Geological Survey in Dade and Broward counties, the Tallahassee Leon County 208 program and Brevard County 208 program support this finding. Anderson (1982) states "Favorable soil conditions which enhance substantial infiltration are controlling criteria for swale system placement. Varying soil moisture affects runoff curve numbers, soil moisture storage depletion capacity and infiltration capacity. The combination of the above site-specific parameters determines the applicability and effectiveness of swale systems for stormwater quantity and quality control". He further concludes that an appropriate input to swale design methodology is a specific quantity of precipitation which must be subject to treatment. Section 17-25.025(1)(d) F.A.C. advises an applicant of a specific set of sizing criteria for swales based on the infiltration capacity of the soil and a specific design storm event. These standards are intended to encourage the use of swales or waterway systems in areas where the soil infiltration capacity is high and runoff is low. Conversely, they should discourage the use of this practice as the sole treatment mechanism for a project where the opposite condition exists and the level of efficiency (pollutant removal) would be insufficient to meet state requirements.

Wanielista (1981) notes that swale systems must be able to percolate at least 80% of the yearly runoff waters to be consistent with the performance levels of some of the other practices which Chapter 17-25 F.A.C. requires (i.e., retention devices). He also notes that the estimation of the percolation rate and volume is critical to good design procedures. These publications conclude that percolation of 80% of the three year 1-hr. design storm should be sufficient to accomplish this objective. Therefore, this is the design criterion currently specified in the state stormwater rule.

Channel Size for Pollutant Abatement

Several mechanisms including sedimentation, plant filtration, vegetative uptake and percolation through the soil usually function in the removal of undesirable substances from runoff waters subjected to treatment via a swale or grassed waterway. It may be possible to size a system which can be expected to obtain a specified level of treatment based on all of these

processes. However, removal efficiencies associated with sedimentation, plant filtration and vegetative uptake are difficult to estimate.

Dr. Martin Wanielista of the University of Central Florida has developed a simplified design procedure which, in most instances, may be used to size these facilities. The methodology regards a waterway as a treatment system that removes pollutants primarily by percolation. Therefore, estimation of the rate at which water can be taken into and transmitted through the soil is critical to the design procedure. In this respect the designer is sure to be confronted with many judgement decisions. Sometimes referred to as percolation rates by sanitarians or as rates of permeability in soil surveys, the movement of water into and through Florida soils may range from 100 inches/hour for some coarse sands to less than .005 inches/hour for a few of the clay soils of the panhandle.

Information published by the Soil Conservation Service pertaining to permeability rates in conjunction with detailed soils maps may be used to establish an estimate of the system's capacity for percolation. However, a site survey by a professional soil engineer or SCS personnel should be requested to confirm the soil types and percolation in the project area prior to design. To ensure that the swale is properly designed, field testing of the percolation rate is preferred. Care must be taken to ensure representative testing locations and climatic conditions. The double ring infiltrometer type of field test is recommended over the more conventional standard "borehole type percolation test" for these evaluations.

Avellaneda (1985) discusses the results of tests pertaining to the infiltration capacity of swale systems in Central Florida. He notes that soil types in the vicinity of the experimental systems included Leon fine sand, 0-2 percent slopes; Blanton fine sand, 0-5 percent slope; and Iberia clay loam. The SCS permeability (in./hr.) was listed as 10-20 for the Leon series and 5-10 for the Blanton/Iberia complex. Most importantly, based on the results of twenty-two experiments at five sites, he concludes that:

1) Emphasis must be made on predicting a reasonable rate of infiltration because it has the greatest effect on the accuracy of the design.

2) The SCS values for permeability represents a wide range of values which makes it difficult for the designer to predict a value that accurately describes the infiltration behavior of the swale. Therefore, the designer should use the most conservative value for the infiltration rate.

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3) The longitudinal slope is a very important parameter to be considered, because the steeper the slope, the less predictable the infiltration rate from permeability data.

4) If the double-ring infiltrometer is used, a value of infiltration rate equal to one-half of the value obtained with the double-ring method is recommended. If the lab permeability can be obtained, also a value of one-half of the permeability should be used as the infiltration rate.

5) When few estimates are available, the lower of each estimate should be used to determine how each value would affect the geometry of the swale, and then the proper selection for the final design should be made.

The steps in the design of swales for stormwater pollutant removal may be summarized as follows:

Step #	Description
3-1:	**Determine the simplified rational method hydrograph for the three year one-hour design storm based on procedures illustrated in Chapter 5.** It should be noted that the time of concentration (Tc) of the contributory area must be estimated to determine the shape of the hydrograph. In most instances, projects using swales will be composed of a single reach or a number of reaches wherein Tc will be one hour or less.

Example

Determine the discharge associated with the three year one-hour design storm for a 10-acre project located in Tallahassee (FDOT rainfall intensity - duration frequency curve, Zone 2, Figure 6-18). Assume the developed project has a rational runoff coefficient equal to 0.5 and the time of concentration is 20 minutes.

The peak discharge for the inflow from the three year one-hour storm is:

$QpI = CiA$ Where, $C = 0.5$, $A = 10$ AC, $i = 2.5$ in/hr, $Tc = 20$ minutes

$QpI = 0.5 \times 2.5$ in/hr $\times$ 10 Ac

$QpI =$ **12.5 Ac in/hr or 12.5 cfs**

The volume of runoff associated with the inflow hydrograph must also be determined.

$$\text{Vol. Inflow } V_I \text{ (ft}^3\text{)} = QpI(D) \times 60$$
$$= (12.5)\ (60)\ (60)$$
$$V_I = 45{,}000 \text{ ft}^3$$

Where,

V_I = Vol. Inflow (ft^3)
QpI = Peak discharge from inflow hydrograph (ft^3/sec)
D = Duration of rainfall (minutes)
60 = Conversion factor (60 sec./min.)

The simplified inflow hydrograph for this example is illustrated, see Figure 6-21.

3-2: **Percolation from a swale will produce an associated infiltration hydrograph.** The volume of infiltration expected to occur during the duration of the runoff hydrograph must be determined in order to check the swale's ability to percolate at least 80% of the runoff volume (V_I) from the three year one- hour design storm.

The volume (V_F) associated with the infiltration hydrograph (shown superimposed on the inflow graph with Figure 6-21) may be determined by calculating the peak rate of percolation associated with the swale (QpF) and multiplying by the value of the rainfall duration plus the extra time required until the receding leg of the inflow hydrograph and the infiltration hydrograph intersect each other. For lack of a better term this expression is shown as (D_F) in the figure. Mathematically the equation for the relationship may be written:

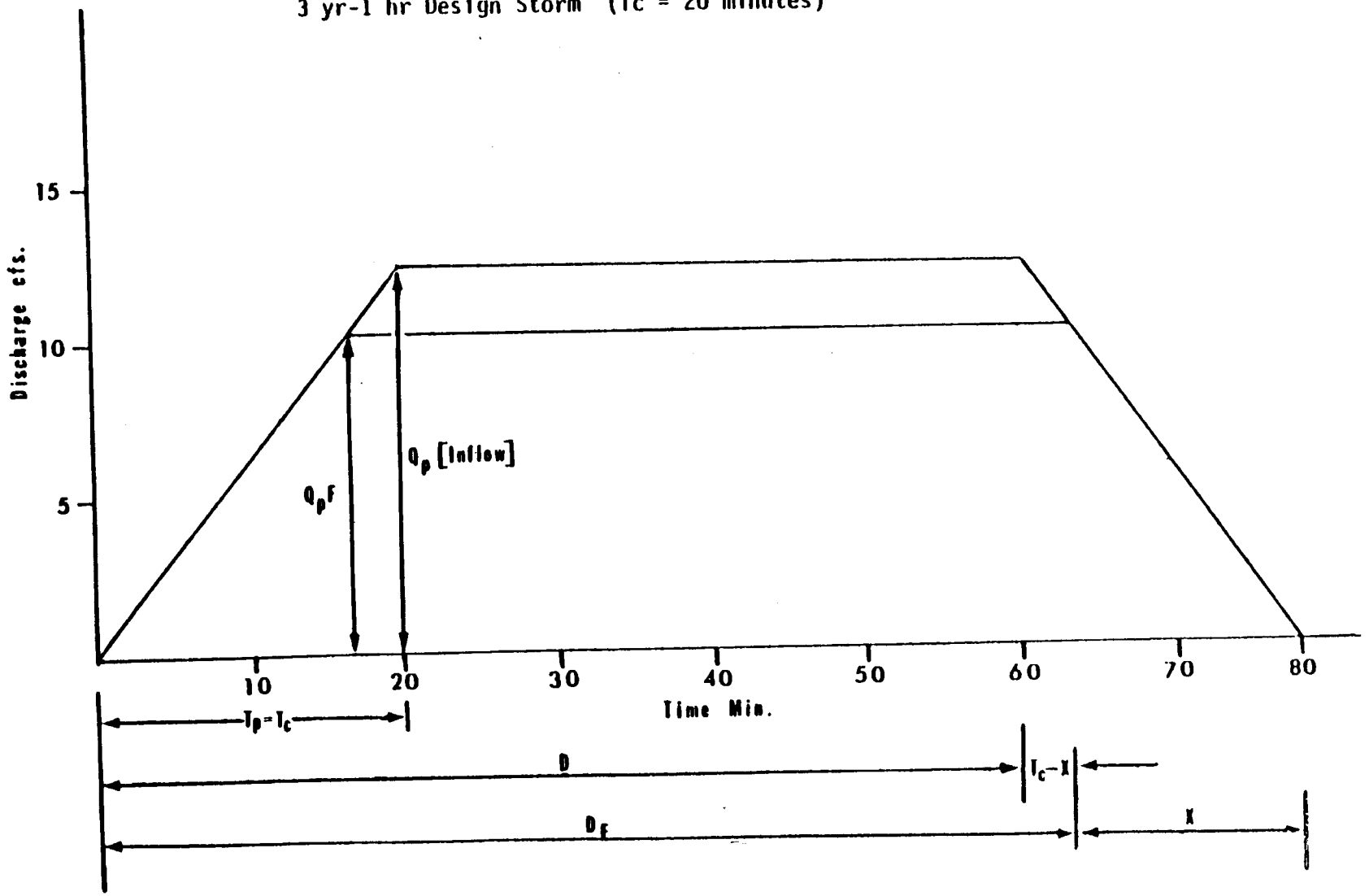
$$V_F = (QpF \times D_F \times 60)$$

Where all terms are as discussed above and 60 is a conversion factor for minutes to seconds.

The value of D_F may be considered equal to (D+Tc-x) as shown. In this example problem the values of D and Tc are known to equal 60 minutes and 20 minutes respectively. The value of (x) may be determined from the principle of proportional triangles as follows:

FIGURE 6-21

Typical Simplified Inflow and Infiltration Hydrograph for the 3 yr-1 hr Design Storm (Tc = 20 minutes)



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$$\frac{x}{QpF} = \frac{Tc}{QpI} \quad \text{or} \quad x = \frac{Tc\ (QpF)}{QpI}$$

Therefore; substituting this value into the two relationships discussed above,

$$D_F = (D + Tc - x) = D + Tc - \frac{Tc\ (QpF)}{QpI}$$

and;

$$V_F = QpF \times D_F \times 60 = [QpF]\ [D + Tc - \frac{Tc\ (QpF)}{QpI}] \times 60$$

Where,

V_F = Volume of Infiltration (ft^3)
QpF = Peak rate of Infiltration (ft^3/sec)
QpI = Peak rate of inflow (ft^3/sec)
D = Duration rainfall (minutes)
Tc = Time of concentration (minutes)
60 = Conversion factor

In the above expression all values except QpF are known or have been previously determined. QpF may be calculated assuming the percolation rate of the soil is known and the swale area has been predetermined.

Example

Assume the project is 10 acres as noted earlier. Further presume that the watershed is relatively square, 660 ft on each side and the design calls for swales (6 ft wide) along both sides of each of three streets through the subdivision. A total of 3,960 ft (660 x 6) of swales is planned for the project.

Question: Will 3,960 ft of swale be sufficient to percolate 80% of the three year one-hour storm, assuming the SCS soil permeability is listed at 6-12 inches/hr.?

The rate of percolation (K) to be used is: 6 inches or 0.5 ft/hr

Maximum swale area (A) available for percolation equals length (L) x wetted perimeter (P). In equation form this relationship may be expressed as follows:

$$A = L \times P$$

In this instance the swale length is (L = 3960ft)as noted above. The appropriate value for P is dependent on the geometry or swale shape that the designer proposes. Vee shaped and parabolic swales are commonly used in residential areas. Trapezoidal shapes are used by the Florida Department of Transportation along roadsides.

The trapezoidal shape is the most proficient from an infiltration standpoint. More soil/water contact area (A) is available per given unit of top width and depth when using this swale configuration. However, as noted in previous sections of this discussion trapezoidal shapes tend to revert to parabolic or "V" shaped conveyances. The available surface area associated with parabolic swales is intermediate and should be used given these circumstances.

The following equations may be used to calculate the appropriate value for the wetted perimeter (P).

$$P = 2\sqrt{1+Z^2}\ d \quad \text{(Vee Shaped)}$$

$$P = b + 2d\sqrt{1+Z^2} \quad \text{(Trapezoidal)}$$

$$P = T + 8d^2/3T \quad \text{(Parabolic)}$$

All terms are the same as discussed earlier. For an illustration see Figure 6-16 regarding the individual shapes.

In this example assume the swale system is a parabolic design as discussed previously.

$$T = 6 \text{ ft and } d = 1 \text{ ft}$$

Therefore:

$P = T + 8d^2/3T = 6.44$ ft

$A = Lx\ P = 3960$ ft x 6.44 ft = **25,502 sq.ft.**

Infiltration Rate (QpF) = KiA.
Assume i = 1 (conservative assumption) then
$QpF = 0.5$ ft/hr x 1 x 25,502 ft^2
$= 12{,}751\ ft^3/hr$ x 1 hr./3600 sec.

$QpF =$ **3.54 ft^3/sec.**

Volume of Infiltration

$$V_F = [QpF][D + Tc - \frac{Tc\ (QpF)}{QpI}] \times 60$$

Where $QpF = 3.54\ ft^3/sec$
$QpI = 12.5\ ft^3/sec$ (Step 3-1, Example)
$D = 60$ minutes (1 hour storm)
$Tc = 20$ minutes (Step 3-1, Example)

$$V_F = (3.54)\ (60 + 20 - \frac{20\ (3.54)}{12.5})\ (60)$$

$V_F =$ **15,789 ft^3**

Is the value of V_F, 80% or more of V_I (from Example: Step 3-1)?

$$\frac{V_F}{V_I} \times 100 = \frac{15{,}789}{45{,}000} \times 100\% =$$ **35%**

As may be seen in this example the designer has not provided enough swale area to accomplish the treatment requirements specified by Chapter 17-25 F.A.C. With the possible exception of those areas of Florida where the percolation rate is extremely rapid it is highly unlikely that any swale can be designed to infiltrate eighty percent of the rainfall excess from a three year one-hour storm event. Since this design is short on area or percolation capacity it would be permissable to incorporate small check dams into the swale system or elevate the culverts crossing the swale at driveways so that storage is provided for the difference in volume between 80% V_I and V_F. Likewise, since swales are primarily conveyance systems which remove pollutants by percolation, a tile drain beneath the channel or other means of providing drainage could be considered.

Our example system could not provide sufficient storage even if it were completely blocked and built on a perfectly flat gradient. In these circumstances it would usually be advantageous for the engineer to consider the system as a linear retention/detention facility. In this manner it is possible to use check dams and/or other structures such as elevated outlets or spillway pipes in order to hold the first half inch of runoff. Thereby, the swale area may be capable of

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satisfying other general permitting provision contained in Chapter 17-25 F.A.C. pertaining to retention or detention with filtration.

Planning a Swale System or Waterways

Surveys Required: As noted earlier sufficient topographic, vegetative cover and soil survey information is needed to determine drainage area size, runoff magnitude and velocity, significant changes in elevation or direction of flow; the location of natural draws and depressions; and the percolation rate at the site.

Equipment Needs: If tne swale or waterway must be crossed or maintained with large equipment, consideration should be given to the need for increased width and flat cross section. Large mowing equipment may require a significant increase in width over that needed for hydraulic capacity and freeboard. This problem deserves careful study in each project area so that the proper modifications are made in swale width and side slopes to meet the needs of equipment common to the locality.

Construction

Equipment: Many kinds of farming and construction equipment are adapted to the construction of waterways and swales. However, it may be necessary to use equipment that can load and transport the excavated material to locations where it is needed. These points of need might be low spots in the surrounding area or washes in the conveyance that need filling. Small scrapers that can be pulled by farm tractors are satisfactory units for construction. However, large scrapers, bulldozers and motor patrols are excellent types of equipment for constructing these systems and may be used when needed.

Site Preparation: The waterway should be staked for construction. All trees, stumps, brush and similar material should be removed from the site and disposed of in such manner as to not interfere with proper functioning of the system. Design and construction survey notes should be kept according to standard engineering practice.

Excavation: The soil removed from the waterway should be deposited where it will not interfere with flow of water into the waterway. Normally it can be used to fill low spots or build diversions to keep runoff from the swale during vegetation establishment.

The topsoil should be saved and spread in the constructed waterway if necessary for obtaining a good vegetative cover. When this is done, the

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waterway should be over-excavated to allow for replacement of the topsoil without encroaching on the design cross section.

Establishing Vegetation: Vegetation is established usually by seeding or by planting the roots or other vegetative parts of the selected plants. In the more critical sections of some waterways it may be desirable to provide immediate protection by transplanting a complete sod cover.

Jute, plastic, or paper mesh and straw or hay mulch may be used to protect the center portion or entire width of a waterway or swale until the vegetation becomes established.

All seeding, planting and sodding should conform to sound agronomic recommendations (see ES BMP 1.65, 1.66 and 1.67).

The swale and its outlet shall be protected against erosion by vegetative means as soon after construction as practical and before diversions or other channels are connected to them. Consideration should be given to sodding the channel to provide erosion protection as soon after construction as possible. The following steps will help to ensure good vegetative cover:

1) Grade and smooth as needed and feasible to permit the use of conventional equipment for seedbed preparation, seeding and mulching.

2) Install other needed erosion control practices such as berms, diversion or interceptor ditches to protect the area during establishment of vegetation.

3) Apply fertilizer and lime in accord with applicable standards as determined by a soil test.

4) Prepare a good smooth seedbed. Incorporate fertilizers and lime into the top two or three inches of soil. Firm with cultipacker before seeding.

5) Select a suitable plant species. Apply seed uniformly with a cyclone seeder, drill cultipacker seeder or hydroseeder. If hydroseeder is used the slurry will contain the seed and fertilizer.

6) All vegetative channels or outlets should be mulched. See MULCHING (ES BMP 1.75).

7) Where feasible, temporary diversions or other erosion control practices should be used to dispose of runoff water during period of establishing vegetative cover.

8) If soil moisture is deficient when planting, apply adequate water for seed germination and plant emergence. Continue to irrigate as needed until plants are well established and have provided adequate ground cover to protect the area.

Operation and Maintenance

Timely maintenance is important to keep a swale in good working condition. Fertilizing and mowing should be done frequently enough to keep the vegetation in vigorous condition. The cut vegetation should be removed to prevent the decaying organic litter from adding pollutants to the discharge from the swale.

Vehicular traffic should be excluded from the waterway. Following heavy rainfall always inspect the area for failures and make necessary repairs, replacements, or re-seeding within the planting season. If complete re-seeding is necessary, apply half the original recommended rate of fertilizer with a full rate of seed.

Many residents in areas which use swales find these areas to be convenient sites for the disposal of leaf litter, grass clippings, and other types of refuse. The proper operation of these facilities from both a hydraulic and treatment standpoint is dependent on the integrity and knowledge of the residents the system serves. A few careless individuals can result in an outlet getting plugged with debris. These circumstances lead to abnormally high levels of organic material being delivered to downstream waters, and sometimes flooding of a neighbors property. Public education programs should be undertaken, as necessary, to ensure that swales are not used as trash disposal areas.

SWALE BLOCK DESIGN

These appurtenances may appear to be simply mounds of soil piled across a swale. However, for proper operation and stability the use of suitable procedures for sizing and spacing is imperative. A swale block system that is not designed to store the runoff from the appropriate design storm (three year one-hour) and which does not consider overflow will not only fail to provide for the intended level of treatment; but, it is also sure to lack structural integrity. Such facilities may be expected to wash out after several consecutive storms. Consequently, the over-all performance of the swale system in terms of its capacity to percolate runoff, promote improved sedimentation, and thus remove pollutants is highly dependent on the proper

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design and installation of these rather innocuous structures. Several researchers at the University of Central Florida have worked to develop design procedures which may be used to assist in swale block sizing and spacing (Rehmann-Koo, 1984; Wanielista et.al., 1985; and Wanielista et.al., 1986). Essentially, rainfall excess as well as the geometry of the swale, its' slope and the infiltration capacity of the soil will determine the size and the distance between swale blocks.

Calculating the Volume of Storage:

The volume of storage that must be provided can be determined in one of two ways. The first was illustrated in the example problem discussed previously. As noted earlier, the method consists of estimating the volume of runoff associated with the three year one-hour storm. Its' eightieth percentile value is then compared with the amount of water which can be infiltrated by the swale during the course of the design event. The excess runoff (i.e., 80% runoff volume minus the swale infiltration volume) must be stored behind swale blocks for percolation following the storm.

In similar fashion, the second procedure also involves compiling an estimate of runoff (R) for the design rainfall. However, a swale volume runoff coefficient (Cv) is used to translate the watershed runoff volume into swale discharge according to the following equation:

$$S = C_V R = 3630\ C_V cPA$$

where:

S = swale volume of discharge (cu.ft.)
C_V = swale volume runoff coefficient (dimensionless)
R = 3630 cPA
c = watershed area runoff coefficient from Table 5-1 (dimensionless)
P = rainfall depth (inches)
A = watershed area (acres), and
3630 = conversion factor (ac.in. to cu.ft.)

The value of (S) is subsequently subtracted from the value of (R) to determine the volume of swale infiltration (F).

$F = R-S$; or
$F = R - (C_V R) = R(1-C_V)$

The volume of storage (V_S) which must be provided in the swale block pool may be determined as follows:

$Vs = .8R-F$
$Vs = R(.8 - (1-C_V))$

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Therefore, swales with a volume runoff coefficient (C_v) exceeding a value .2 will require some degree of storage (Vs).

Selecting the Appropriate Swale Volume Runoff Coefficient (C_v):

Experiments clearly indicate that the higher the value of the beginning water content of the soil profile, the smaller the value of the infiltration rate. Therefore, the coefficient (C_v) increases as the moisture content increases, and the coefficient of discharge decreases as the length of swale is increased.

Unfortunately, very little data is available to the design engineer that is suitable for the purpose of obtaining an accurate estimate of C_v. Since there is a wide variety of watershed conditions, each location must be examined individually. The results of ten field experiments to evaluate the water flow characteristics for several (three) swale areas in central Florida (Wanielista, 1985) show values of C_v ranging from 0.0 to 0.74. The median and mean value recorded were 0.59 and 0.52 respectively. A conservatively high value of C_v = 0.70 was recommended for subsequent design problems pertaining to road-side swale systems.

Spacing Between Swale Blocks:

Since the slope of the channel is generally fixed by the topography the spacing of swale blocks is predominantly determined by the longitudinal slope(s) along the proposed route of the channel and the maximum depth of storage (d) determined at the descretion of the designer. Values of d are generally limited to two feet or less for reasons of safety in residential developments. Similar restrictions are normally followed for both public safety and road bed protection reasons when swales are associated with highway construction.

Therefore, as an example if the slope or grade of the swale is equal to .5 feet/100 feet (i.e., s = .005 ft./ft.) and the maximum depth is limited to (d = 2 ft.), the optimum spacing (i.e., greatest amount of storage per structure) would be achieved when the distance between structures (L) is equal to 400 feet. This value is determined as follows:

$$L = d/s$$

where:

L = optimum length of swale pool (ft.)
d = depth of storage (ft.)
s = longitudinal slope or grade of the swale (ft./ft.)

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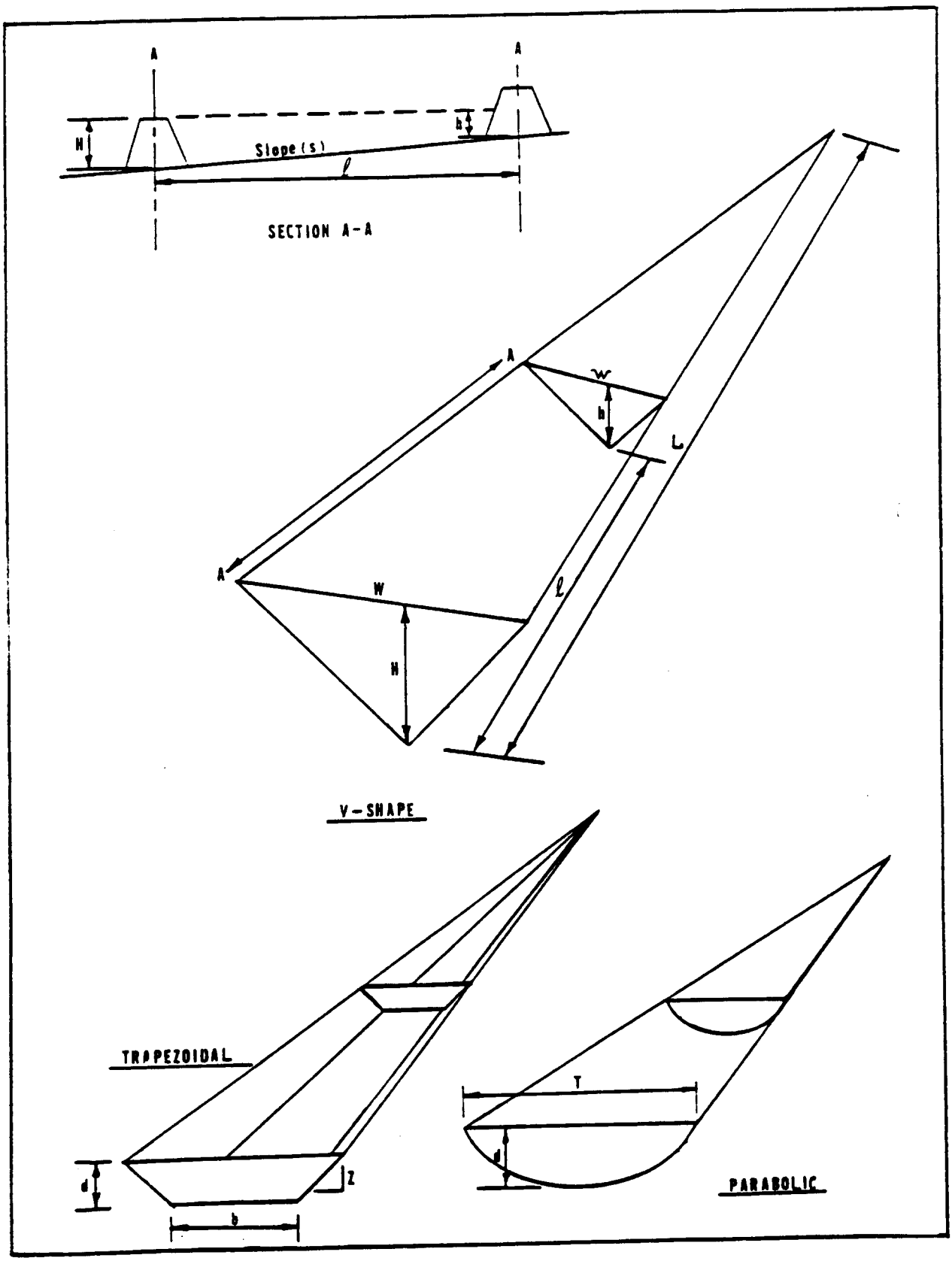
FIGURE 6-22

SWALE BLOCK ISOMETRIC FOR CALCULATING STORAGE VOLUMES



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By substituting the previously derived values for slope and depth into the equation:

$$L = 2/.005 = \boxed{400 \text{ ft.}}$$

Estimating the Number of Swale Blocks Required:

Depending on its spacing, a swale block is viewed to produce a pool of water similar in shape to either a pyramid or a frustum of a pyramid (see Figure 6-22).

The available storage can be estimated for various cross sections and slopes of swales using the equation given below:

$$S = (\ell/3)\ (A + a + Aa)$$

where:

ℓ = truncated length of swale block (feet)
L = total or optimum length (feet)
S = Volume at end of swale (cubic feet)
A = Cross-sectional area at berm (square feet)
= (W) (H)/2 "V-Shape", bd + Zd^2 Trapezoidal", and 2/3 Td "Parabolic"
a = Cross-sectional area upstream of berm if obstructed upstream (square feet)
W&T = Top width of swale at berm (feet)
H&d = Maximum depth of swale at berm (feet)
b = bottom width of swale (feet)
Z = side slope ratio feet horizontal/foot vertical rise

Example Problem:

Continuing to expand on the hypothetical situtation and data generated in the preceding section, the use of this design procedure is illustrated in the following discussion. However, since it has already been established that the previous swale system has no possibility of providing the level of storage required, for illustration lets presume that the swale cross-section is expanded and that the longitudinal slope is much more flat. In this instance suppose the swale is parabolic but that the top width (T = 12 ft) and depth (d = 2 ft) are double their earlier values.

Assume the longitudinal slope of the swale system is 0.5% or .005 ft/ft as discussed earlier in this example. Further presume that runoff is split evenly between the six branches of the system, and that swale

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blocks are planned at the outflow and in the middle of each reach. A total of twelve swale block pools will be created and each must handle an equal proportion of the total runoff (i.e., 45,000/12 cu.ft.) as calculated in the previous problem. Since each reach is a constant slope with similar landuse and other hydrologic conditions the designer can design the structures for one branch and this configuration will also be applicable to the other five sections of the system. The value (R = 3750 cu.ft.) may be used to size each of the twelve elements in this project.

Experience shows that it is desirable to limit the swale block height (d) to no more than 1.5 feet from a safety and maintenance viewpoint. To begin the analysis the designer should first determine the maximum length (L) of the swale block pool given the desired depth or height of the swale block. As noted earlier:

$$L = d/s$$

Where;

d = height of the swale block

= 1.5 ft (presumed)

s = longitudinal slope

= .005 ft/ft (given)

Therefore:

$$L = \boxed{300 \text{ ft.}}$$

Since the value of (L) is less than the spacing desired (i.e., 330 ft) the swale pool is not truncated and ($L = \ell$). Using a swale volumetric runoff coefficient Cv of 0.70 as recommended in the previous section of this document the following calculations for swale design result.

Volume of storage (Vs) which must be provided in the swale block pool for each cell:

$$Vs = R\ (.8 - (1 - Cv))$$
$$Vs = 3750 \text{ cu.ft. } (.5) \text{ or}$$

$$Vs = \boxed{1875 \text{ cu.ft.}}$$

The Volume of Storage (S) Available:

$$S = (L/3)\ (A)$$

Where; $A = 2\ Td/3$ and,

$T = 6d$ (as specified by rule)
$d = 1.5$ ft.

$A = 9$ sq.ft.

$L = 300$ ft (previously calculated)

By substitution:

$S = (300/3)\ (9)$ or,

$S =$ **900 cu ft**

The result shows that the proposed configuration does not provide sufficient storage to satisfy the designer's objectives. There are other options, however. The most simple course of action is to reduce swale block spacing and increase the number of cells within each reach.

Suppose, that four swale blocks are used. Each pool would be (660 ft/4 = 165 ft) in length. The volume of storage which must be provided in each pool is one-half its former value or ($Vs = 1875/2 = 937.5$ cu.ft.). Since the spacing is now less than optimum where (L = 300 ft) each pool will be truncated forming a frustrum of a pyramid in shape. The designer must determine the upstream area (a) to determine available storage (S) in comparison to (Vs) required.

The upstream depth (d2) must first be determined. It may be calculated as follows:

$$d_2 = d_1 - (\ell \times s)$$

Where;

d_2 = upstream depth (ft)
d_1 = height of swale block
= 1.5 ft.
ℓ = truncated length
= 165 (ft)
s = longitudinal slope
= .005 ft/ft

$d_2 = 1.5 - (165 \times .005) =$ **0.675 ft.**

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The area (a) may now be determined.

a = 2 Td/3 as before,

Where:

T = 6d and
d = d_2 = .675 ft.

Therefore;

a = (2) (6 x .675) (.675)/3 or,

a = **1.82 sq.ft.**

Solve the Storage Equation to Determine (S)

$S = (\ell/3)(A + a + Aa)$

Where:

ℓ = 165 ft (from above)
A = 9 sq.ft. (calculated previously)
a = 1.82 sq.ft. (from above)

Therefore:

S = **1496 cu.ft.**

Since the value of (S = 1496 cu.ft.) is greater than the storage volume required (Vs = 937.5 cu.ft.) the designer may use this design. However, this system exceeds design capacity by a substantial amount. Consequently, the engineer may wish to continue these iterations until a more optimum configuration is derived.

Details for Swale Block Construction

Swale blocks may be constructed using a variety of materials including wood, concrete, asphalt, metal, natural soil or a mixture of each. The most common application is the use of native in place soil fashioned in the form of a low berm. Regardless of the material or materials chosen to form the restriction the designer should take proper precautions to ensure that the facility is not subject to undercutting and erosion especially along its toe.

A typical cross section of a berm type system is shown below. (See Figure 6-23). Research conducted by the University of Central Florida indicates that three swale block systems constructed in accordance with the specifications shown still existed for more than two years after their

construction. Wash out did not occur even though three storms greater than three inches were recorded during this period.

These researchers suggest that swale block height should be limited to 1.5 feet for public safety and roadway subgrade protection. It is also recommended that the following guidelines be applied to ensure good structural integrity and easy maintenance (mowing).

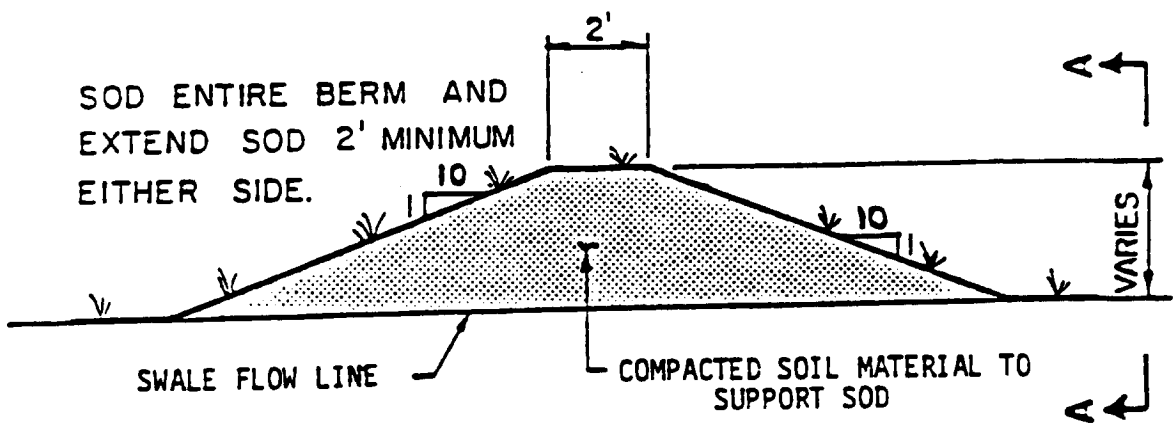
1) The front and back slope of the structure should not be steeper than ten feet horizontal to 1 ft vertical unless pavement or other equally stabile material is used to protect the berm from erosion during overflow conditions.

2) Berms should be constructed of clean stable material suitable for the construction of embankments. The material should be free from tree roots, construction debris and other extraneous material. Clayey sand, Unified Soil Class (SC) which was mechanically compacted was used by the UCF researchers. Inorganic silts, (ML and MH), organic silts (OL), and organic clays (OH), as well as peat or other highly organic soil (PT) should not be considered. The designer should also be aware that cover (i.e. grass) may be hard to establish when using material of high permeability in classes (SW) and (SP) for example.

3) Sod should be used to protect these embankments from erosion. Protection should be provided extending at least two feet from the toe of the berm along both the face and back slope of the structure.

Figure 6-23

TYPICAL SWALE BLOCK CROSS SECTION (NOT TO SCALE)



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SW BMP 3.05

PARKING LOT STORAGE

Definition

Providing temporary surface storage and controlled release of stormwater runoff on paved (impervious) parking areas or within parking lot landscaped islands.

Purpose

To reduce the adverse impact of runoff from impervious parking surfaces on receiving waters.

Conditions Where Practice Applies

Where portions of large, paved parking lots can be temporarily used for stormwater storage without significantly interferring with normal vehicle and pedestrian traffic. Shopping centers and large employee parking areas are likely places for use of this measure. Wherever parking lot landscaped islands are required.

Planning Considerations

Paved parking areas can have a significant impact on downstream receiving waters. The impervious surface which often replaces natural vegetative cover causes increases in the volume and peak rate of runoff and also provides a place for traffic-generated residues and airborne pollutants to accumulate and become available for washoff.

Detention of stormwater on paved parking surfaces or within recessed landscaped islands is a technique used in many localities to deal primarily with the problem of increased runoff peaks from relatively minor storms. This practice in itself can also contribute to a decrease in nonpoint source pollution for the following reasons:

1) In areas with combined sewers, the reduction in peak runoff rate can contribute to a reduction in the frequency and magnitude of sewer overflows.

2) In areas without combined sewers, the reduction in runoff peak can contribute to decreased stream channel erosion and subsequent sediment pollution downstream.

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3) By temporarily ponding runoff there is an increased opportunity for particulate matter to settle out.

4) The first flush or shock loading effect of the polluted runoff is decreased because the stormwater is released over a longer period of time.

5) By placing raised storm sewer inlets in recessed landscaped areas, some infiltration and settling will occur before the stormwater is conveyed by the storm sewer.

Parking lot ponding is usually accomplished by using specifically designed or modified inlet structures which cause stormwater to temporarily pond in specially graded areas of a parking lot. An illustration of a typical parking lot storage system cross-section is shown in Figure 6-24.

The effectiveness of parking lot storage for nonpoint source pollution control can be increased by routing ponded water over infiltration areas and/or trenches. An easy way of promoting infiltraiton is to place raised storm sewer inlets within recessed landscaped areas. Curb cuts will allow runoff to enter the mini-retention/detention area where infiltration can occur before the stormwater rises to the elevation of the inlet. Infiltration allows a certain amount of the ponded water to be purified by the soil. Before using infiltration techniques in conjunction with parking lot storage a determination must be made as to the possible effect upon groundwater. The Exfiltration Section (SW BMP 3.03) contains relevant information on this topic. Other infiltration practices such as porous pavement, concrete grid and modular pavement, grassed waterways, filter strips and seepage areas can also be used in conjunction with parking lot storage to reduce nonpoint source pollution.

Design Criteria

Wherever they exist, local criteria for the design of parking lot storage systems should be followed. If no local criteria exist, the following may be used as design guidelines:

Storage Volume and Release Rate: Design of the storage volume and release rate is dependent upon the purpose of the system. In parking lot detention systems, the storage volume is usually limited by the size and grade of the parking lot and the proximity of ponding areas to structures and traffic routes. There will seldom be enough storage volume to control moderate or major flooding downstream unless additional storage volume is provided.

For nonpoint source pollution reduction, a slow release rate is needed (i.e., 0.1 inch per day to 1 inch per day). Detention times in excess of 30-40 hours are most effective. Unfortunately, stormwater detention for such long

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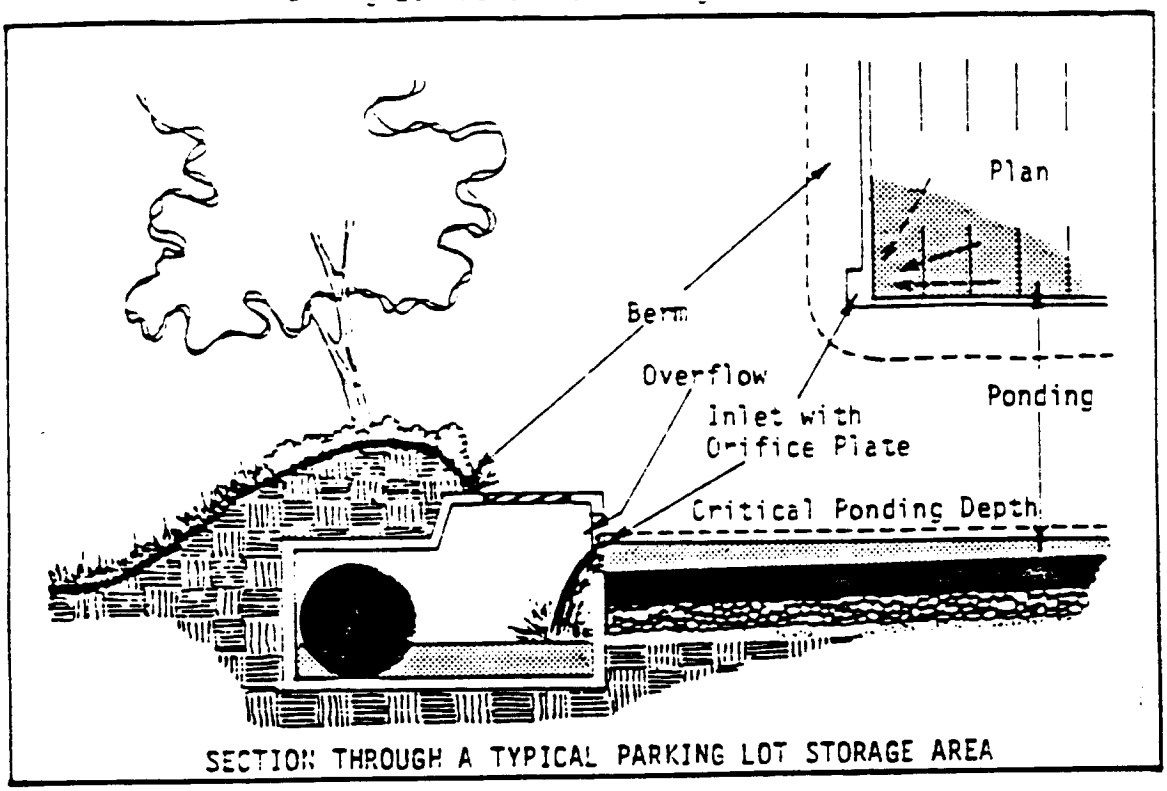
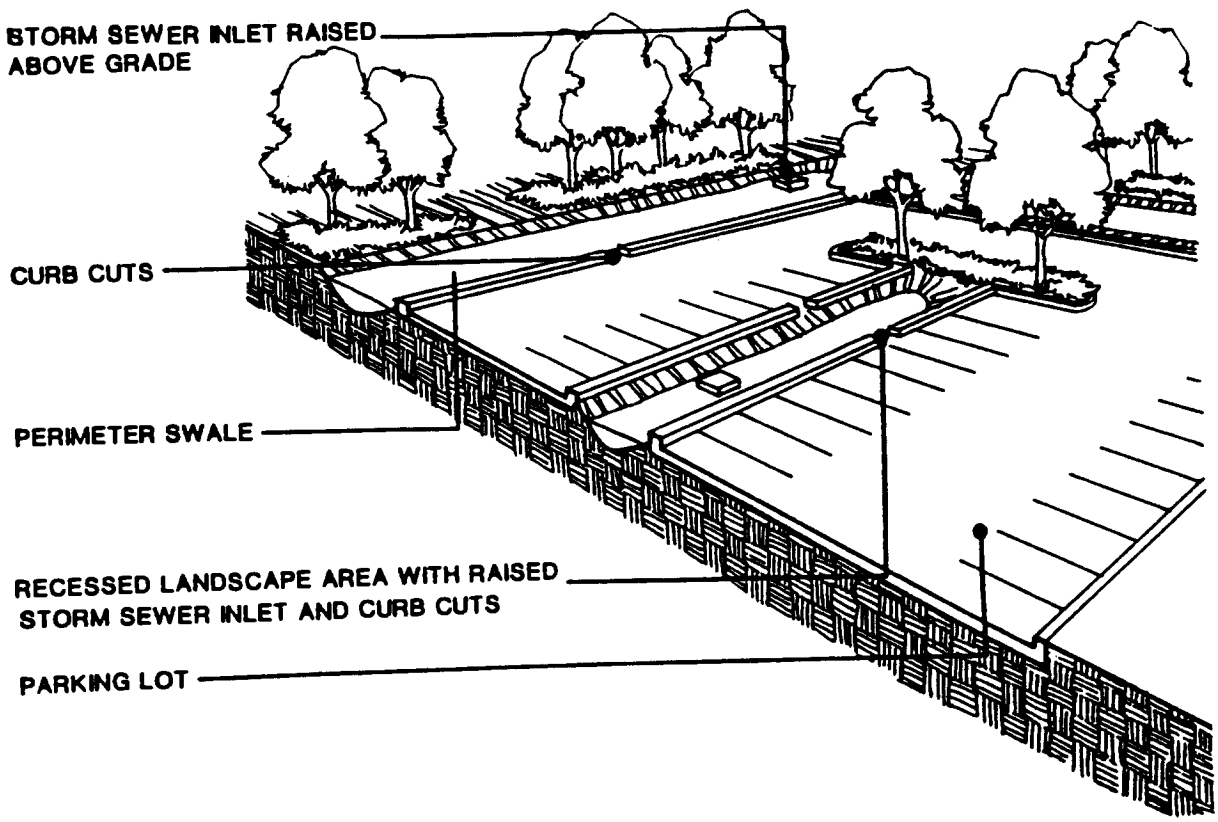
FIGURE 6-24

Parking Lot Detention Configurations





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periods of time is not desirable on a parking surface. A good alternative is to design the parking lot storage system in conjunction with a subsurface retention/detention system such as infiltration trenches and/or pits. The subsurface system can be designed to collect a small initial volume of runoff while the surface ponding system can be designed to control a specific design storm at a pre-development level.

Minimum Slope: The storage area should have at least 0.5 to 1 percent slope toward the outlet to assure complete drainage following a storm.

Maximum Depth: The maximum depth of water within the pond area is not recommended to exceed 7 inches.

Location: The portion of the parking lot where runoff storage is planned should be located so that there will be minimum interference with pedestrian and vehicular traffic during a storm. Remote perimeter areas of large parking lots are usually best suited.

Overflow: The parking lot storage system should be designed so that overflow from storms larger than the design storm will not cause excessive damage or inconvenience. Specifically, there should be no potential for flooding of nearby buildings, major throughfares or other important facilities.

Warning Signs: Ponding areas should be well marked with signs or pavement markings advising users to avoid these areas during storms in order to protect their vehicle brake linings from wetting and to prevent inconvenience to themselves.

Maintenance

Discharge control structures should be inspected periodically and following each storm. Accumulated debris and litter should be removed as necessary to assure proper functioning.

Parking lot surfaces must be cleaned following storms to provide a reasonable level of pollution control and reduce accumulation of litter, debris, traffic-generated residues and other nonpoint source pollutants. Sweeping or vacuuming is recommended.

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SW BMP 3.06

POROUS PAVEMENT

Definitions

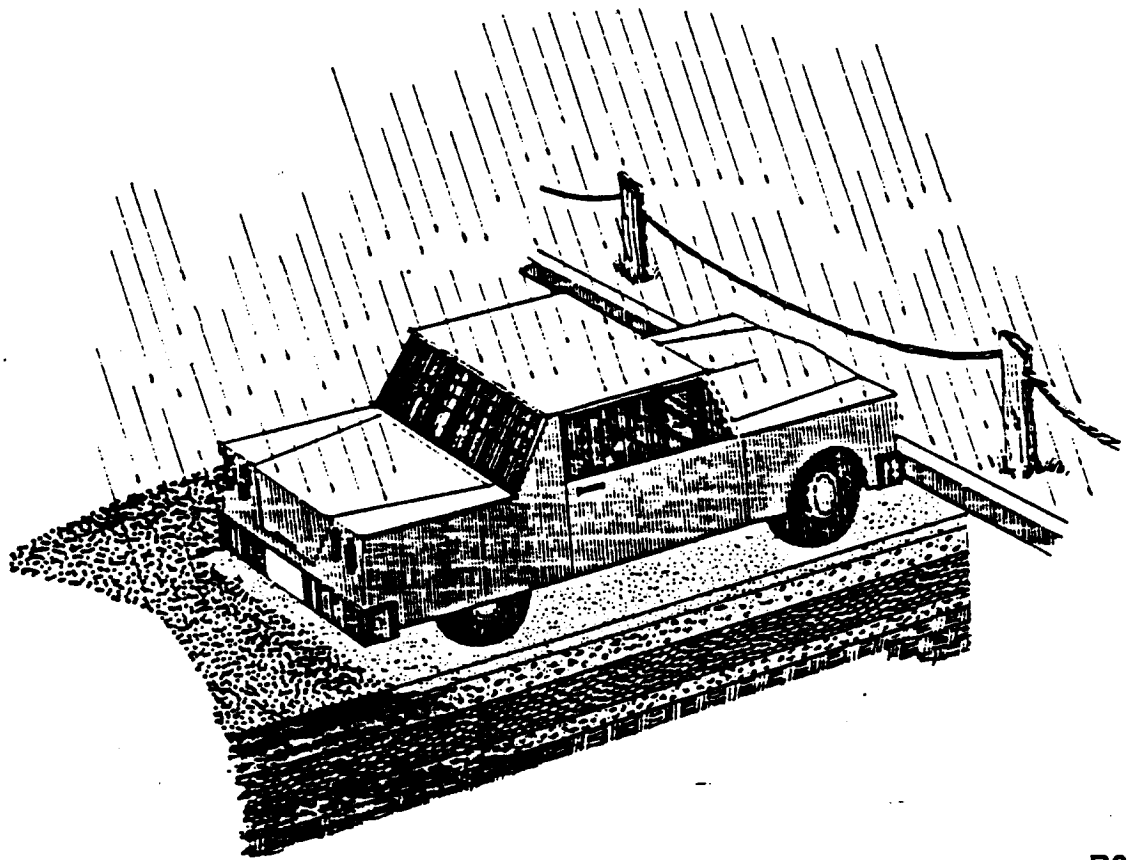
The use of a porous asphaltic paving material and a high-void aggregate base that allows for rapid infiltration and temporary storage of rain falling on or runoff delivered to paved surfaces. As described herein, porous asphaltic paving material consists of an open graded coarse aggregate cemented together by asphalt cement into a coherent mass, with sufficient interconnected voids to provide a high rate of permeability to water.

Pervious concrete consists of specially formulated mixtures of Portland Cement, uniform open graded coarse aggregate (FDOT #8 or #89, 3/8 inch to no. 16 or no. 50 recommended), and potable water. This material may be combined with certain water reducing and retarding or accelerating admixtures along with air entraining agents. When properly handled, and installed pervious concrete has a high percentage of void space which allows rapid percolation of liquids through the pavement.

Purpose

1) To reduce volumes and peak rates of runoff normally associated with urban-type development, thereby reducing the potential for combined sewer overflows and for downstream channel erosion and subsequent sediment pollution.

2) To improve water quality by filtration and bacterial action.



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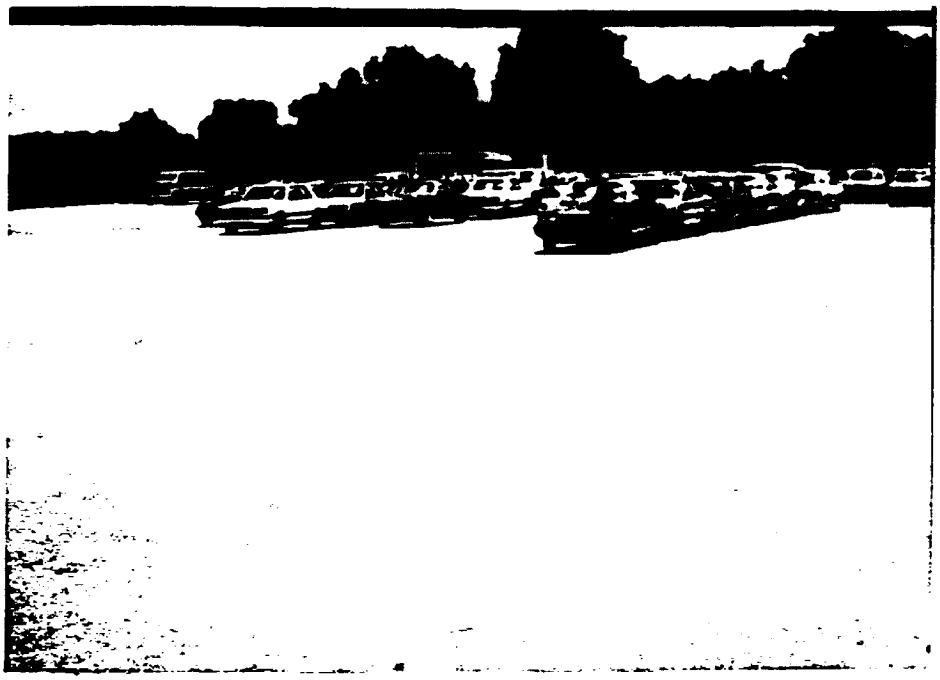

Parking Lot of Pervious Concrete Near Tampa International Airport

Conditions Where Practice Applies

Theoretically, applicable as a direct substitute for conventional asphalt and concrete pavements wherever on-site detention is necessary to control runoff rates, volumes, and/or quality. However, this practice is most popular for low-volume traffic areas such as parking areas, where stable subgrade soils having at least moderate permeability exist. The practice should have a wider range of application in areas with very sandy soils.

Planning Considerations

The use of porous pavement in place of conventional impervious paving material is quite new and represents a significant departure from conventional pavement design. Extensive laboratory testing and some limited field testing and experience seem to indicate that this practice has good potential for a wide variety of applications. However, a number of

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questions have been raised concerning the potential benefits verses possible shortcomings of these materials which require further consideration and analysis. The following is a discussion of some of the major factors which should be considered in determining the applicability of this practice.

Possible Problems

1) Wet Subgrade: A wet subgrade is inherent to porous pavement. If the subgrade soil cannot support the design load under saturated conditions, this practice would not be applicable without first replacing the subgrade with a suitable material.

2) Water Stripping (Asphalt): Generally, open-graded mixtures may be considered more prone to water stripping than conventional dense aggregate mixtures because of water access. However, tests have shown that if the aggregate is dried adequately and the asphalt is properly designed and mixed, stripping should not be a problem. Stripping prevention is discussed later under Construction and Materials Specifications.

3) Pressure Head on Slopes: Rapid subsurface drainage on steep slopes may create water pressure at low points of the pavement. This problem can be alleviated through the use of spaced collection pipes which can capture subsurface flow on slopes and direct it away from the pavement.

4) Pore Clogging: On pavements with high-volume traffic and heavy use or those located in particularly dirty environments, such as near a sandy beach, particulate matter as well as grease and oil may clog void spaces quite readily, thus reducing the infiltration capacity of the pavement and restricting its intended function. Clogging can be prevented through periodic vacuum cleaning. This problem is not as evident on low-volume, light use pavements. To preclude premature clogging porous pavement should not be placed into service until all areas that contribute stormwater runoff to the on-pavement retention system have been effectively stabilized.

5) Groundwater Pollution: The asphaltic oils that could be leached from hot-mix asphalt pavements during the first several weeks following placement as well as motor oil drippings and gasoline spillage have the potential to pollute groundwater. However, these systems may be less prone to problems than more conventional retention ponds or trenches since the pollutants are not collected in a small area for treatment. Stormwater along with the pollutants it carries should wash through to nature's own treatment plant, the soil.

Organic materials and any other biodegradable waste should then be metabolized by soil bacteria.

Possible Benefits

1) Reduced Stormwater Management Requirements: Under most conditions, porous pavement can significantly reduce or eliminate surface runoff from the areas it covers. Where separate storm sewers already exist or are to be installed, use of porous pavement could produce substantial cost savings. With existing separate sewers, the use of porous pavement could alleviate the need to install additional capacity when the present storm sewer capacity is fully utilized. For future installations, the use of porous pavement would allow reduction in the design capacity of the storm drainage collection system installed. Catch basins could be reduced in size or number. Consequently, the volume of septic sludge which builds up in them would be reduced, lowering the cost of having them cleaned periodically.

2) Safety Improvement:

   a) Skid Resistance: Porous pavement overlays (friction courses) on conventional surfaces have been found successful in preventing wet skidding or hydroplaning. Other research has shown that conventional dense paving material consistently exhibits dry skid resistance better than or equal to that of porous pavement installation, but porous pavements are clearly superior under wet conditions. In fact, conventional pavements exhibit a decline in their coefficients of friction when wet, while porous pavements seem to exhibit an increase in their coefficients of friction when wet.

   b) Enchanced Visibility: Visibility of pavement markings during rain is expected to be improved because of rapid removal of water and because of the marking material penetrating the voids to present an oblique view. Research has shown white marking paint slightly superior to yellow paint on these surfaces. Enhanced visibility of pavement markings could be an important factor in accident mitigation during storms.

3) Water Quality Improvement: A permeable subgrade and a sufficiently deep water table below the pavement surface provide an opportunity for a significant amount of infiltration to occur. Depending upon soil type and water table depth, this increased infiltration can lead to a significant reduction in the annual pollutant load associated with these surfaces versus non-porous pavement.

4) Preservation of Vegetation: Plants and vegetation along conventional roads, particularly in areas of high pavement densities, are often starved for water because the dry soil under the road tends

to rob their supply. Porous pavement would restore natural moisture, to the benefit of roadside vegetation.

5) Reduced Puddling: Use of porous pavement eliminates inconvenient surface puddling and provides for pavement drainage with no crown slope necessary. The pavement can be laid perfectly level, presenting a pleasing appearance.

6) Color Infusion: Porous pavement is adaptable to color infusion through the use of colored aggregate or colored roofing granules applied to the surface.

7) Noise Reduction: Porous pavements have been found to be slightly less noisy than conventional pavements.

Potential Regulatory Conflicts

The sizing of storm sewerage systems is determined by ordinance in most municipalities. However, porous paving is a relatively new development, and few local regulations contemplate its use. Consequently, flood control authorities may not permit any reduction in the size of storm drains or other drainage structures. Such restrictions eliminate the economic advantage of porous pavement. Local regulations may need to be revised to permit the use of practices like porous pavement that may have wide-ranging environmental benefits.

General Design Criteria

Porous pavement installations should be designed and constructed according to applicable standards and specifications of local, state or national standard-setting agencies or organizations such as the Federal Highway Administration, the Florida Department of Transportation, the local Water Management District, the City or County Public Works Department, the Asphalt Institute, the National Crushed Stone Association, the National Sand and Gravel Association and the Florida Concrete and Products Association. The following guidelines should also be used.

Retention Storage Volume Needed to Satisfy State Stormwater Quality Regulations

In order to provide a level of pollutant removal equivalent with other practices recommended for use in Florida the pavement must have the necessary reservoir capacity to store and percolate the first half-inch of untreated runoff from the parking lot or roadway and any other contributing area within a 72-hour time period. The ability to store and percolate at least 80% of the runoff from a three year one-hour design storm may also be used to demonstrate equivalency in lieu fo the former criteria.

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To satisfy state criteria the storage volume required (Vr) may be calculated in the same manner as other retention devices. The mathematical expression is:

$$Vr = (1/2 \text{ inch} \times A \times 43{,}560 \text{ sq.ft./ac} \times 1 \text{ ft}/12 \text{ in.}) \text{ or,}$$
$$Vr = 1815\ A$$

where:

Vr = Volume of Storage Required (cu.ft.)
A = Size of the facility plus any additional contributing area (Ac)

The nature of each individual site will determine the design of the porous pavement to be placed on it. A thorough prior examination of the site is of primary importance to the proper functioning of the pavement. Each case is different depending upon site and particularly soil conditions, the wear expected on the surface itself, and the objectives of the designer in regard to the particular use for the porous surface.

Estimating Available Storage

Calculation of Void Space: Void space should be calculated according to the testing procedure recommended in Federal Highway Administration Report No. FHWA-RD-74-2. The volume of the sample should be measured mechanically rather than calculated from a water displacement method because a great deal of water is absorbed. This error might affect the computation of reservoir capacity.

As of this printing a consistent statewide policy has not been established in reference to credit for storage volume within the voids in the pavement and the coarse aggregate base (when used). The Department (FDER) normally allows an applicant to consider storage within the pore spaces of both. This policy is consistent with that for other subsurface retention facilities supported by open graded material (e.g. exfiltration trench storage criteria). The agency will also count the capacity to hold water over the pavement if the facility is curbed and all potential outlets are elevated for storage.

Most other local, regional and state permitting authorities will also allow up to 6 inches of available surface storage credit for flat parking areas ringed with curb and gutters under similar circumstances. However, most agencies differ in their opinion as to the appropriate percentage of credit to be given for storage below the surface. The level may range from 0% to 100% depending on jurisdiction.

When designing these facilities the engineer is urged to contact the appropriate agency for a determination. FDER or the appropriate local Water

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Management District with delegated stormwater permitting autnority should be contacted for water quality treatment purposes. Tne city, county, water management district or FDOT snould be consulted for drainage connection purposes.

In defense of the various agencies that have failed to reach a concensus regarding this technology, the designer should realize that the major concern with porous pavement is that its' quality, and permeability appear to be very sensitive to batching and installation techniques. Among other factors, the water to cement ratio which is used in the mixing operation and how carefully the material is placed by the contractor will impact the available void space associated with the pavement. Consequently, it is difficult for the designer or review authority to predict the exact amount of storage space which will be available within the matrix of the material.

Couple these uncertainties with a tendency for the void space to become filled over time with sand, silt and clay carried and deposited on the pavement by automobiles, and one can begin to understand the reason for the divergence of opinions that the designer must currently cope with. Counting only storage which can be achieved on top of the pavement alleviates this problem.

However, the storage available (Vs) would be calculated in the following manner presuming that the designer were to be given credit for storage available within the pavement and the open graded aggregate subgrade material (if used):

$$Vs = A \times d_1 \times p_1/100 + A \times d_2 \times p_2/100$$

where:

Vs = Available storage in the pavement and subgrade matrix (ft^3)
A = Area of the pavement (sq.ft.)
d_1 = Thickness of pavement (ft.)
d_2 = Thickness of subgrade base if used (ft.)
P_1 = Percentage pore space or voids in pavement
P_2 = Percentage pore space or voids associated with the subgrade if used.

Example:

Suppose a developer is building a 20 acre shopping center. The soils are fine sand and the topography is flat. Assume that project is 85% buildings and parking lot and that 10 acres or 50% of the project is paved with porous pavement. How much storage is available within a six inch thickness of pavement plus an open graded subgrade course of equal dimension?

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Assume that field testing of the pavement mix to be used had been performed and were available from the supplier. The results indicate that the void space could be expected to range from 12% - 22%. Presume that the subgrade was estimated to have 40% pore volume.

The storage volume may be determined as follows:

A = 10 ac x 43,560 sq.ft./ac or $\boxed{A = 435,600 \text{ sq.ft.}}$

The pavement depth and subgrade depth are said to be equal. Each is noted to be six inches thick. Therefore, $\boxed{d_1 = d_2 = .5 \text{ ft.}}$
The pore space or percentage voids in the pavement (p_1) ranges from 12% to 22%. Be conservative, use $\boxed{P_1 = 12\%}$

The subgrade coarse is presumed to contain 40% voids by volume in this problem. Consequently the value of (p_2) is known

$\boxed{P_2 = 40\%}$

Substituting these values into the equation:

$$Vs = 435,600 \times .5 \times 12/100 + 435,600 \times .5 \times 40/100$$

$\boxed{Vs = 113,256 \text{ cu.ft.}}$

This value (Vs) would be compared with the 1/2" storage volume required (Vr). Should the relationship (Vs - Vr) be a negative number the designer would need to provide on pavement storage for the remainder or increase the pavement or coarse aggregate base thickness to provide the additional storage.

In this instance, presume the entire 20 acre project contributed runoff via the parking lot. The storage required may be determined as noted earlier [Vr = 1815A = 36,300 cu.ft.]. The value (Vs - Vr) is not negative. Therefore, the facility would have much more capacity than needed.

Storage Volume Recovery

In accordance with state criteria these facilities must be capable of recovering their storage volume (primarily through percolation) within 72 hours following a storm.

This capacity is evaluated in the same manner as other retention facilities by a simultaneous solution of "Darcys" and the "Continuity Equation".

$$Q = KiA$$

where:

Q = Rate of recovery (cfs)
K = Hydraulic conductivity or percolation rate of the soil (in/hr)
i = Hydraulic gradient (usually assumed = 1, conservatively)
A = Area of the pavement (Ac)
[NOTE: 1 Ac in/hr = 1 cfs]

The value determined for (Vr) is subsequently divided by the value of (Q) from the preceding equation to determine the recovery period (Td) in seconds.

$$[Td = Vr/Q]$$

Assuming that $Td/3600 \leq 72$, the design would be acceptable.

SITE SURVEYS AND INFORMATION REQUIRED

The type of surveys and information required is similar to other retention facilities. At a minimum a soil survey and drainage area map should be prepared. The topography of the site before development and after construction is completed will be of interest and should be provided. Similar to other retention areas the location should be examined to provide permitting authorities with an estimate of the seasonal high groundwater elevation as well as any sensitive geologic conditions that could result in groundwater contamination due to inadequate treatment. The latter is discussed more thoroughly in RETENTION (SW BMP 3.07).

Survey and Investigations

Soil Borings: Test borings should be taken to determine the character and permeability of the soil. The ability to transmit the water passing through the pavement is crucial to the treatment efficiency of these systems. In some cases, where soil permeability is poor, an alternative approach to the removal of water from the base reservoir is required.

Percolation Tests: The double ring infiltrometer test would normally be the method of choice for this type of installation. However, when substantial excavation is contemplated, the testing procedure that is used should be capable of characterizing the infiltration capacity of the appropriate soil layer on which the pavement will actually rest when completed.

DESIGN AND PLANNING CONSIDERATIONS

Subgrade: Water continually in contact with silty or clay types of subgrade soils will saturate and decrease the strength of the subgrade and, in turn, lower the load-carrying capability of the roadway. Therefore an ideal soil for use as a subgrade must have adequate load-bearing capacity wet and dry. The ideal soil must be well-drained; that is, the water table must be so far below the surface that the rise of water by capillary action will not come close to the surface. The soil must be permeable to water so that water is transmitted relatively quickly down through it. Finally, it must be quite porous so that it has the capacity to imbibe large quantities of water in its surface layers.

Likely soils to meet these requirements would be a sand to sandy clay loam some distance above the water table. Soil types classified under the Soil Conservation Service hydrologic soil group (HSG) category A or B are recommended for consideration. The particles for this type of soil ranges from sand to clay, but the clay content must be low enough to leave good void size and permit capillary flow downward at a suitable rate. If too clayey, the soil compacts very well and carries the load when dry, but porosity is lacking and transmission of water through the clay is very slow. Likewise, clays may also absorb more than enough water to fill their voids, thereby swelling and becoming very low in load support value. This situation is relatively common following excavation into HSG-B soils in North Florida.

Drainage: If tests indicate that the subgrade is too impermeable to drain the base course reservoir within a reasonable amount of time, it will be advisable to provide a supplementary stormwater system. There are a number of popular stormwater practices capable of adequately removing the water remaining in the base course. These include:

1) **Rock Filled Trench:** This system uses coarse open-grade rock in trenches that are interconnected with the base (reservoir) course which supports the pavement (see Figure 6-25(a,b,c). Drains are located along the edges or in laterals spaced evenly beneath pervious parking areas or roads. The subgrade (soil) is sloped toward the trench such that excess water is conducted

laterally through the coarse aggregate base and possibly via the pavement surface to the collection system.

Although not illustrated in Figure 6-25(a), these appurtenances would usually be directly connected to the primary drainage system (e.g., drainage ditch, canal or stormsewer) by a positive outfall pipe covered with hardware cloth or other type wire mesh screen. The screen is intended to prevent the coarse aggregate from washing into the pipe. A perforated underdrain pipe (Figure 6-25b, c) sometimes covered with a filter fabric sock is another popular means to provide for recovery of the base reservoir storage capactiy within the time frame desired by the designer.

The latter would usually be sized by using techniques for estimating the diameter of tile drains required given a specified rate of removal (see UNDERDRAIN, SW BMP 3.10). The former may be sized in the same manner as estimating orifice area required for drawdown (see DETENTION SW BMP 3.05).

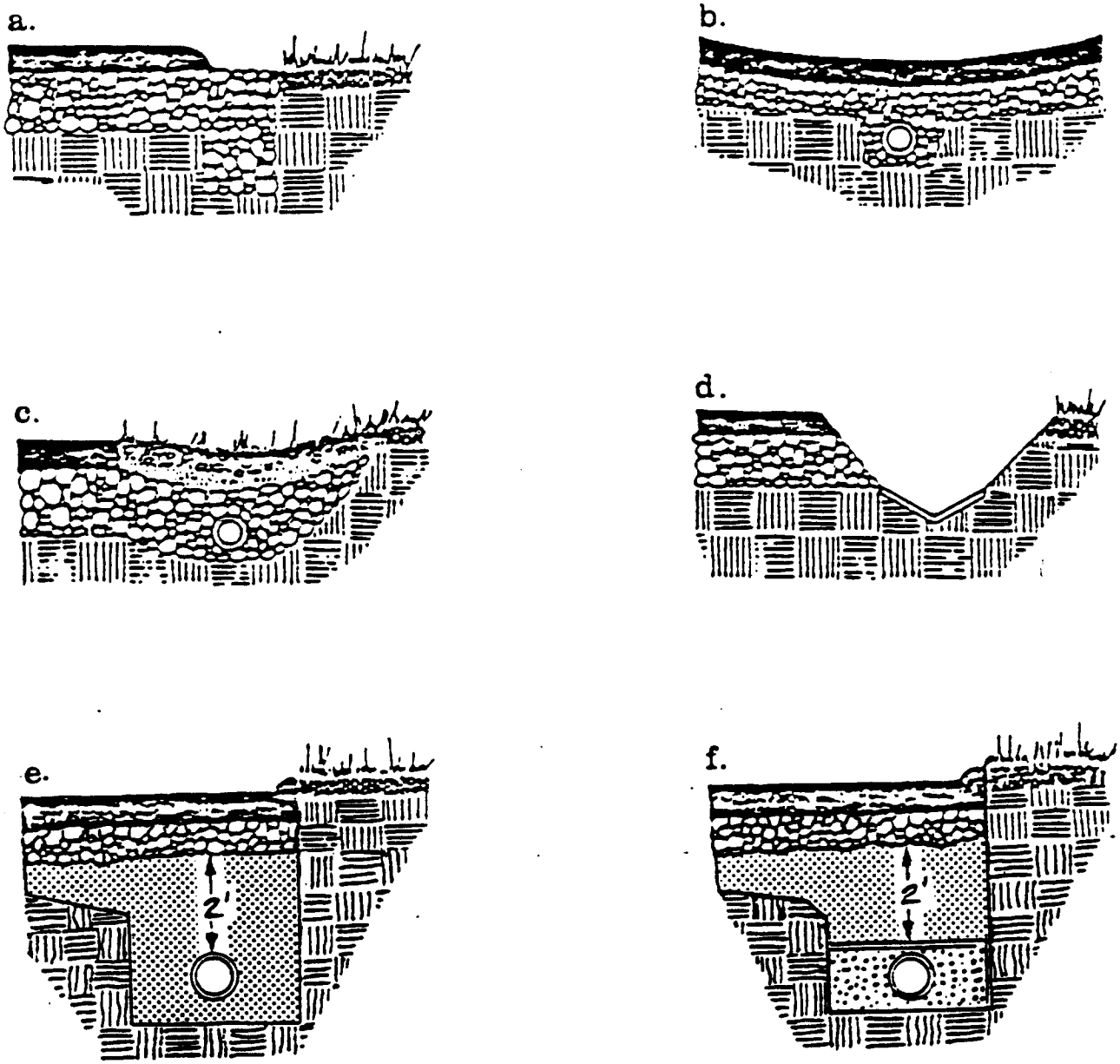
In either instance, the designer should be aware that these systems only provide for temporary attenuation of runoff. **These positive drainage systems will not provide a substantial improvement in the quality of water discharged versus conventional pavement. Consequently, these systems must be emptied into a properly designed wet detention pond or other suitable treatment system prior to discharge off-site.**

2) V-Trench Water Removal to Pond: Another positive method of removing water from the base reservoir is to use the base material as a drain for transport to a relatively shallow V-trench at a low point in the cross-section of the roadway. If a heavy volume of water is expected or an appreciable gradient is involved, it would be advisable to pave the trench or size the facility such that the erosive velocity for the soil and cover is not exceeded. (See SWALE SW BMP 3.04). The V-trench shown in Figure 6-25(d) must also be emptied into a wet detention pond or other suitable treatment system prior to off-site discharge.

3) Sand Underdrain: With this type system a sub-base is provided as a filter medium. The coarse open rock drain layer (base) is underlain by a suitable filter layer (sub-base) such as clean concrete sand, approximately 6 inches in depth. The subgrade (soil) is sloped toward a single peripheral or a series of evenly spaced trenches beneath the pavement. Water is collected by a perforated pipe installed near the bottom of the trench. Provided that the minimum distance that water must travel through the sand before reaching the perforated pipe (Figure 6-25e) or reaching

FIGURE 6-25

Examples of Porous Pavement Drainage Systems



Source: Investigation of Porous Pavements for Urban Runoff Control, Thelen et al

(after Virginia State Water Control Board, 1979. "Urban Best Management Practices Handbook")

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the gravel envelope surrounding the underdrain (Figure 6-25f) is 2-feet or more, these systems currently would not require additional treatment. Methods for sizing underdrain systems and the state criteria pertaining to sand filters are discussed in SW BMP 3.10. The designer should be thoroughly familiar with the requirements and drawbacks associated with stormwater filtration devices before making the decision to use this type of system for stormwater management.

Aggregate Gradation and Quality: The gradation required to obtain a porous asphalt or concrete pavement is of the "open" graded type as contrasted to the "dense" graded type which is capable of close packing. However, not just any coarse aggregate of suitable grade will work well. Experience with some locally available material consisting of crushed limestone has not been completely satisfactory.

Designers should avoid using relatively "soft" aggregate especially in pervious concrete applications. The capacity of this material to absorb substantial quantities of water seems to result in difficulties obtaining an acceptable and consistent water to cement ratio. As a consequence several applications experienced raveling that was so severe that the original treatment scheme was abandoned in favor of a more conventional approach.

The aggregates selected for porous pavement construction should be of the recrystalized type which will not hydrate. It should be hard and durable. The material should not contain phosphate or calcium florappatite within its matrix. The appropriate (ASTM) testing standards for these purposes are listed in the section entitled "Construction and Materials".

Factor of Safety in Design: Some pavement designers have suggested that because open graded mixes are not as strong as dense graded mixes, the pavement thickness needs to be increased. However, with normal and proper construction practices, sufficient subgrade compaction should be achieved so that with a well-drained subgrade a California Bearing Ratio (CBR) of six or seven could be used quite safely. These CBR values would permit pavements to be considerably thinner than normally specified.

The design of porous pavement roadways equivalent to conventionally constructed roads has been found to depend primarily on the load-bearing capacity of the subgrade, the expected traffic volume and the reservoir capacity of surface and base. Specifications of the Asphalt Institute have been used to design the porous pavement roadways illustrated in Table 6-10. Most, if not all, applications in Florida thus far have been for "light" duty service as mentioned earlier.

Because of the low load-bearing capacity of a wet subgrade, a very poor subgrade (CBR = 2) has been assumed in establishing these designs. Traffic volumes are indicated by the Design Traffic Number (DTN), which is the average number of equivalent 18,000 pound single-axle loads per day expected in the heaviest traffic lane during the design period (normally 20 years). The method of calculating the DTN is given in detail in

the Asphalt Institute Manual Series No. 1, "Thickness Design." The classifications are as follows:

DTN	TRAFFIC CLASSIFICATION
1 - 10	Light (parking lots, residential streets)
10 - 100	Medium (city business streets)
100 - 10,000	Heavy (highways)

TABLE 6-10

THICKNESS REQUIREMENTS FOR SURFACE AND BASE COURSE FOR POROUS PAVEMENT

CBR[a]	DTN[b]	SURFACE THICKNESS (INCHES)[c]	BASE THICKNESS (INCHES)[c]	RESERVOIR CAPACITY (INCHES OF RAINFALL) SURFACE	BASE	TOTAL
2	1	4	6	.60	1.80	2.40
2	10	4	12	.60	3.60	4.20
2	20	4-1/2	13	.66	3.90	4.56
2	50	5	14	.75	4.20	4.95
2	100	5	16	.75	4.80	5.55
2	1000	6	20	.90	6.00	6.90
2	5000	7	22	1.05	6.60	7.65

[a] California Bearing Ratio, a measure of the soil support value.

[b] Design Traffic Number, a measure of traffic volume.

[c] Asphalt Institute specifications assume a dense graded mix.

Source: Investigation of Porous Pavements for Urban Runoff Control, Thelen, et,al.

Porous pavement must be designed and built to support the heaviest traffic volumes and loads for a particular application. By increasing the depth of the base course, loads are spread conically over large areas, thus reducing the loading intensity until the subgrade will support the load without undue deformation.

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Volume of Retention Storage Available

The base course depth can and will provide for the load and also act as a water reservoir. The reservoir capacity figures given in Table 6-10 are based upon an assumed average void space of 15% for the surface course and 30% for the base course. These are average values from a number of test results. The percent pore space and the resultant reservoir capacity can be quite variable as mentioned earlier. Consequently, when estimating available storage the engineer should use the lowest percentage voids associated with any particular pervious cement or asphalt and aggregate mixture offered by the supplier.

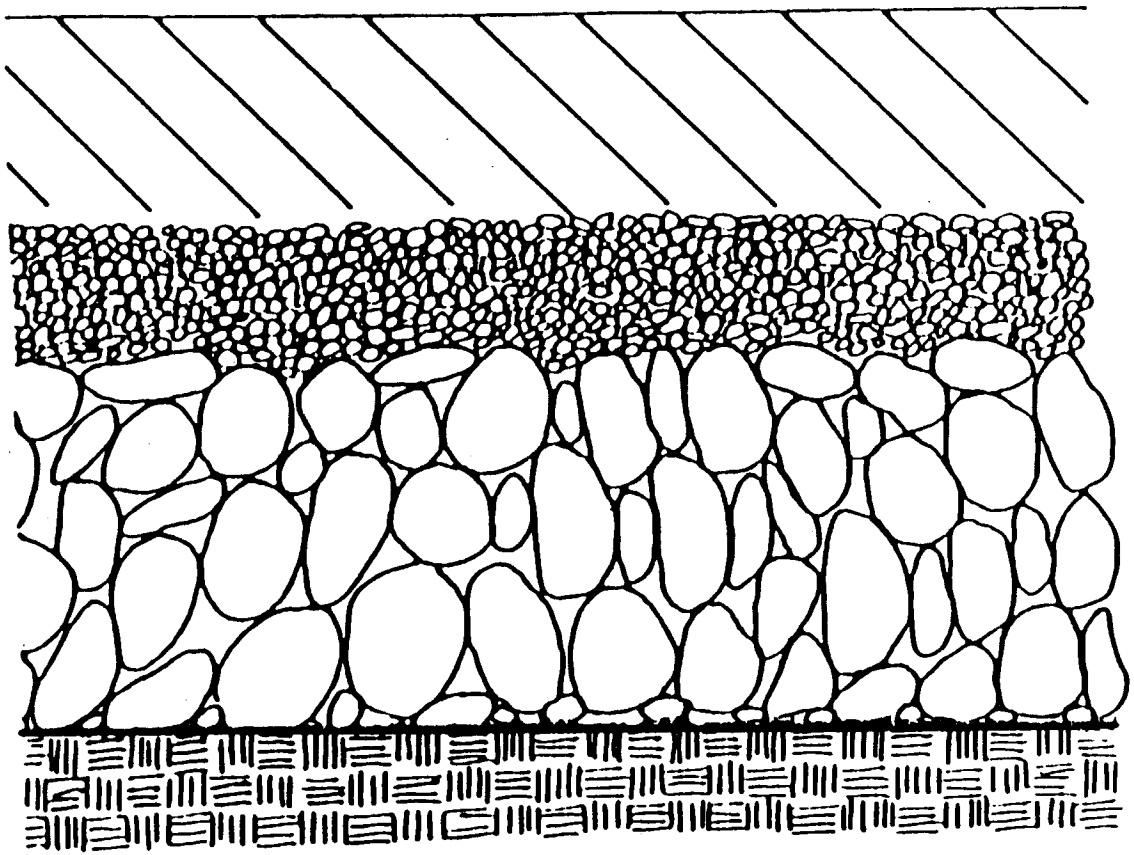
The owner or manufacturer should retain an independent testing laboratory. The testing laboratory shall conform to the applicable requirements of ASTM E-329 "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used In Construction" and ASTM C-1077 "Standard Practice for Testing Concrete and Concrete Aggregates for Use in Construction, and Criteria for Laboratory Evaluation". A minimum frequency of one test for each day of placement is recommended to verify the rodded weight of material as delivered. The test shall be conducted in accordance with ASTM C172 and C-29. The mix shall be within (±5) five pcf of design unit weight. If outside this range, mix proportions shall be modified to comply.

CONSTRUCTION AND MATERIALS SPECIFICATIONS

General: The following section provides construction standards and materials specification associated with each of the two basic categories of porous pavement currently being used in Florida. The section begins by presenting information associated with the installation of porous asphaltic paving material. These standards are followed by recommendations associated with the manufacture and placement of pervious concrete. Requirements associated with other forms of pervious pavements (e.g., turf block) may be found by referring to CONCRETE GRID AND MODULAR PAVEMENT (SW BMP 301).

Porous Asphalt

Thus far the application of porous asphaltic paving material has been minimal in Florida. Only a very limited number of installations have been reported to date. The technology remains predominantly untried, therefore, the standard discussed herein represent suggestions obtained from other regions of the United States where the procedure has had more popularity. This technique has been most extensively used in Maryland. The following discussions and recommended standards were established by the state of Maryland to help ensure the longest possible function of these facilities. The reader should refer to (Figure 6-26) for an illustration



POROUS ASPHALT SURFACE COURSE
1/2" to 3/4" Aggregate
asphaltic mix

2.5 to 4" thickness typical

FILTER COURSE
1/2" Aggretate
2" Thickness

RESERVOIR BASE COURSE
1" to 2" Aggregate
Voids volume is designed for
runoff Retention

Thickness is based on storage
required

FILTER FABRIC

EXISTING SOIL
Minimal compaction to retain
porosity and permeability

FIGURE 6-26

POROUS ASPHALT PAVING TYPICAL SECTION

Modified after Diniz, 1980 and City of Rockville, Maryland, 1982

showing the types of materials used in these installations, their relative location within the matrix and the thickness associated with a typical cross-section of porous asphalt pavement.

The design shown is typical of most installations permitted by the City of Rockville, Maryland. The material is composed of four layers as described below:

1) Minimally compacted subbase consisting of undisturbed existing soil. Auxiliary drainage structures (French drains, pipe drains, etc.) may also be required for soils with slower infiltration rates.

2) Reservoir base course consisting of one to two inch diameter stone aggregate. The thickness of this reservoir layer is determined from runoff storage needs, the soil load bearing strength and the traffic load.

3) Two inches of 1/2-inch aggregate to stablilize and fair the reservoir base course surface.

4) Porous asphalt concrete surface course with a thickness that is based on bearing strength and pavement design requirements. For most applications, light duty applications 2-1/2 to 4 inches have been found to be sufficient.

In addition, a layer of engineering filter fabric is recommended between the soil and the reservoir base course, as shown in the typical porous asphalt pavement cross-section presented in the figure.

Porous asphalt paving is used to recharge groundwater supplies and reduce stormwater runoff and water pollution from paved, low-volume traffic areas by providing a bearing surface having adequate strength to accommodate vehicles while allowing infiltration of surface water and filtration of pollutants.

Subgrade Preparation

1) Alter and refine the grades as necessary to bring subgrade (soil profile) to required grades and sections as shown in the drawings.

2) The type of equipment used in subgrade preparation construction shall not cause undue subgrade compaction. Use tracked equipment or oversized rubber tire equipment - DO NOT use standard rubber tired equipment. Traffic over subgrade shall be kept at a minimum. Where fill is required, it shall be compacted to a density equal to the undisturbed subgrade, and inherent soft spots shall be corrected.

Aggregate Base Course (Reservoir Course)

1) All stone used shall be clean, washed, crushed stone, meeting Florida Department of Transportation specifications.

2) The aggregate shall be of two sizes. The reservoir base course shall be to depth as noted on drawings of 2-inch to 1-inch aggregate (FDOT No.3) or equivalent. A two inches deep top course of 1/2" aggregate (FDOT No. 7) is also recommended.

3) Aggregate base course shall be laid over a dry subgrade covered with engineering filter fabric to a depth shown in drawings, in lifts to lay naturally compacted. The stone base course shall be compacted lightly. Keep the base course clean from debris, and sediment.

Porous Asphalt Surface Course

1) The surface course shall be laid directly over the 1/2" aggregate base course and shall be laid in one lift.

2) The aggregate selected for porous asphaltic pavement construction should meet requirements of the standard specification for "Crushed Stone, Crushed Slag, and Crushed Gravel for Bituminous Macadam Base and Surface Courses of Pavements", ASTM D-693-71, with one exception and one addition. The exception requires the gradation to be of the open graded type for the reasons described previously. The addition should be a requirement for a soundness test as specified in ASTM D-694-62, "Crushed Stone, Crushed Slag, and Crushed Gravel for Dry-Bound or Water-Bound Macadama Base Courses." This is required to determine if the aggregate is susceptible to disintegration by water.

   The aggregate grading shall be of a type (FDOT No. 7 or similar) wherein the majority (60% by weight) of material is concentrated in the 1/2" to 3/8" size range. All stone used shall be clean washed crushed stone containing less than 2% silt clay and organic matter. Any material finer than No. 4 shall be of uniform distribution.

3) The asphalt grade shall meet AASHTO Specification M-20 for 50 to 65 penetration road asphalt as a binder in the southern United States. The suggested viscosity grade of asphalt cement to be used is AC-20 of AASHO M-226-73 I. This grade is to be considered a tentative starting point because test results obtained from the design process may indicate an advantage or a necessity to alter the asphalt grade.

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4) For road paving durability and to prevent too rapid hardening of the asphalt, it is desirable to have the highest asphalt content possible in the mix. Too much aspnalt would separate out under traffic, so that maximum asphalt content is generally limited by that factor. Experience has shown that 5.5% by weight is the minimum recommended aspnalt content. Asphalt content should be determined according to the testing procedure recommended in Federal Highway Administration Report No. FHWA, RD-74-2, Design of Open-Graded Asphalt Friction Courses.

5) The mixing plant shall certify the aggregate and the asphalt content in the mix. The asphaltic mix shall be tested for its resistance to stripping by water using ASTM D 1664. The asphalt-coated aggregate should retain an estimated 95% of the coated area after water immersion of the mix for 16 to 18 hours at 77°F (25°C). If this standard is not met, then anti-stripping agents are added to the asphalt. Many designers, however, feel that this specific testing procedure is not very reliable. Federal Highway Administration Report No. FHWA-RD-74-2 includes a test for resistance to water (Immersion Compression Test) which may also be used for determining whether stripping might be a problem. However, the best insurance for avoiding stripping problems is the use of aggregates and asphalts that are compatible with one another.

6) To ensure that the individual aggregate particles are completely surrounded by asphalt, and that the asphalt is tightly bound to each particle, temperature of mixing at the hot mix plant must be rigidly controlled. Too low a mixing temperature will result in inadequate asphalt binding and coverage of the aggregate, while too high a mixing temperature will allow asphalt to drain from the mix, resulting in a lower asphalt content and decreased strength. Suitable mixing temperatures range from 230° - 260°F, with the recommended temperatures at the lower end of that range (230° - 240°F).

   The minimum air temperature of 50°F, is recommended to make sure that the surface does not cool prior to compaction.

7) Compaction of surface course shall be done while the surface is cool enough to resist a 10-ton roller. One or two passes by the roller is all that is required for proper compaction. More rolling could cause a reduction in the surface course porosity, damage the aggregate, and break the bonding between particles which would shorten the pavement life.

8) Transporting of mix to site shall be in a clean vehicle with smooth dump beds that have been sprayed with a non-petroleum release

agent. The mix shall be covered during transportation to control cooling.

9) Experience has shown the need for close control of contractor vehicles on newly installed areas or porous pavement. Damage to pavement porosity results chiefly from abuse during the early life of the pavement. Normally, paving is done while heavy construction or earth moving is continuing in an area. The new pavement is thus subjected to mud and dirt from contractor vehicles for up to several months, and the continual passage of these vehicles compacts the dirt into the pores. Only if caked mud is cleaned from vehicle wheels and the pavement is cleaned daily by sweeping and high-pressure water washing can porosity be retained. Clogging can be further minimized by proper use of curbing to prevent surrounding soils from washing onto the pavement surface.

CONSTRUCTION AND MATERIAL SPECIFICATION (CONTINUED)

Pervious Concrete

Introduction: Pervious concrete contains a large percentage by weight of aggregate larger than the number four sieve (0.185 inches). Pervious concrete is also referred to by several other names such as open graded mix, gap graded mix, draincrete, popcorn mix, no fines mix or porous concrete. Pervious concrete has a high void space, at least 15% is required and a coarse surface texture. The water-cement ratio is low, 0.20 - 0.40, and the slump is extremely low, often zero.

Excessive amounts of water yield a paste which is too fluid and flows off the aggregate particles, reducing cohesion and filling the voids in the lower part. Too little water results in a paste which does not adhere to the aggregate particles, leading to insufficient cohesion. The quantity of cement paste and water is considered sufficient when it coats the coarse aggregate with a shiny film, giving it a metallic gleam. A typical mix provides a permeability of about 2.3 gallons per minute per square foot. Higher percolation rates are possible with higher void contents, but higher void contents also produce lower strengths.

Compressive and flexural strengths of pervious concrete are somewhat lower than those of conventional portland cement concrete, due to the higher void content and lower unit weight. Compressive and flexural strengths are dependent on the water-cement ratio, aggregate-cement ratio, unit weight, void content and aggregate shape and size. The flexible nature of this pavement means that the subgrade condition is extremely important to the performance of the pavement.

The method of handling and placing are different from other types of concrete. Only concrete firms and contractors familiar with the intricacies of porous concrete should be used and then only if a Professional Engineer,

with training and experience in porous concrete, is present during tne time of paving. Pervious concrete is placed into location and not poured as is conventional concrete. Tne time lapse between batching and placement should be kept as short as possible. Due to its low water-cement ratio, hydration of the cement will proceed faster and strengths may be impaired from delays in placement. Pervious concrete is placed with a minimum of handling. Best results have been obtained by using a vibratory screed, or vibratory bullfloat for small jobs. These may have to be modified by adding extra weight. For uniform compaction it is advisable to have an inch of material along the base of the screed, while moving it over the concrete surface. Hand troweling or finishing is neither required nor desirable, as this will close up the voids and impair the drainage characteristics.

When a vibratory screed is used, its forward movement over the concrete should not be stopped unless the vibrating mechanism is also stopped. Otherwise, there will be variations in the surface texture of the concrete. A straightedge for manual screeding should be available on jobs using a vibratory screed. In the event of machine breakdown, this will permit uninterrupted unloading of the mixer trucks and avoid extended mixing with attendant loss in voids and change in consistency.

The screeding operation must be followed by two passes with a garden roller. This is to assure that any loose particles are becoming well embedded in the pavement surface.

Curing is a very important factor with pervious concrete. With the high void percentage, rapid drying is a far more serious problem because the dry paste fails to bond the aggregate particles together. Therefore, adequate moist curing is essential. The pervious concrete should be sprayed shortly after screeding, with a light mist so as not to wash the cement paste off the aggregate. It is then covered with impervious sheets for at least the first three days, and preferably for a longer period.

A typical cross-section of porous concrete as installed in south Florida is illustrated by Figure 6-27. These installations are different from pervious asphaltic pavement, primarily due to the type of cementing agent that is used in the surface course (e.g., portland cement as opposed to asphalt). However, it is also noticeable that the pavement is placed direclty on the shaped and graded existing sandy soil (pervious subgrade).

Retention storage of up to six inches maximum depth is provided on the surface of the pavement as well as within the voids in the concrete. The load bearing 1/2-inch aggregate base, the open graded coarse aggregate subbase, and filter fabric that were shown with the pervious asphalt cross-section (Figure 6-26) are often not used. When a subbase is required for stability, up to six inches of clean durable quartz sand (FDOT 902 Fine Aggregate) or equivalent is substituted for crushed stone. The concrete is then placed directly on this lightly compacted subbase.

However, the manufacturer of the patented porous concrete paving process includes both the 1/2-inch bearing course and the open graded subbase in

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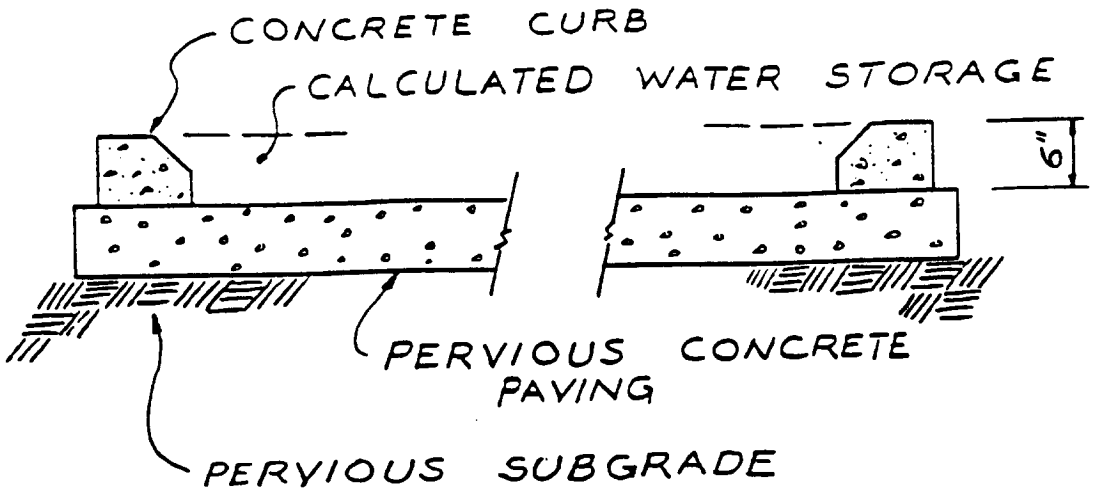
FIGURE 6-27

PERVIOUS CONCRETE PAVEMENT
TYPICAL SECTION





A close-up view of no-fines concrete

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their design. A layer of compacted sand is used between the subbase and the existing soil to prevent the migration of fine material in the surrounding media from migration into the subbase. Certainly this design would provide for more strength and stability and would be preferred in anything exceeding light duty applications.

A manual relating to mixing, hauling, placing, testing and suggested design procedures for use of pervious concrete is available through the Florida Concrete and Products Association at a nominal fee. This comprehensive Manual will assist material suppliers, contractors, specifying agencies and design professionals in the proper procedures used to place portland cement pervious pavements.

At a minimum the following interim specifications should be followed for the manufacture and placement of pervious concrete pavement.

1) Materials:

Locally available materials having a record of satisfactory performance are recommended.

a) The cement used for these facilities shall be Portland Cement Type I or II conforming to ASTM C-150 or Portland Cement Type IP or IS conforming to ASTM C-595. Fly ash conforming to ASTM C-618 may be used in amounts not to exceed 20% of total cementitious material. Ground iron blast-furnace slag conforming to ASTM C-989 may be used in amounts not to exceed 50% by weight of total cementitious material.

b) Use Florida Department of Transportation (FDOT) No. 8 coarse aggregate (3/8 inch to No. 16) ASTM C-33 or No.89 coarse aggregate (3/8 inch to No. 50) ASTM D-448. For designs incorporating fine aggregate, it shall conform to FDOT Specifications 902. Other gradation of aggregate may be used, subject to approval.

c) Air Entraining Agent: Shall comply with ASTM C-260.

d) Admixture: Type A water reducing

Type D water reducing and retarding
Type E water reducing and accelerating
In accordance to ASTM C-494

e) Water: Potable or shall comply with FDOT Standard Specifications, Section 923.

2) Proportions:

a) For pavements subjected to other than light vehicular traffic, the total cementitious material shall not be less than 600 lbs. per unit.

b) The volume of aggregate per unit shall be equal to 27 cu.ft. when calculated as a function of the rodded unit weight determined in accordance with ASTM C-29.

Fine aggregate, if used, should not exceed 3 cu.ft. (rodded unit weight in accordance with ASTM C-29) and shall be included in total aggregate volume.

c) Admixtures shall be used in accordance with the manufacturer's instructions and recommendations.

d) The quantity of mix water shall be such that the cement paste displays a "wet-metallic" sheen, without causing the paste to flow from the aggregate. Insufficient water will result in a dull appearing paste of inadequate consistency.

3) Subgrade Preparation and Formwork:

a) The top six inches of the subgrade shall be composed of granular or gravely soil that is predominantly sandy with no more than a moderate amount of silt or clay.

b) Prior to placement of Portland Cement Pervious Pavement, the subgrade shall be tested for rate of permeability by double ring infiltrometer, or other suitable test of subgrade soil permeability.

c) Subgrade Support: Material shall be placed and compacted in layers of a thickness that can be compacted to a minimum density of 94 ± 2% of maximum density as determined by AASHTOT-180. A minimum Limerock Bearing Ratio (LBR) of 20 ± 2 shall be obtained in the top six inches of the subgrade.

d) Subgrade Moisture: The subgrade shall be in a moist condition with no free standing water prior to pavement placement.

e) Forms: Forms may be of wood or steel and shall be the depth of the pavement. Forms shall be of sufficient strength and stability to support mechanical equipment without deformation of plan profiles following spreading, strike-off and compaction operations.

f) If required, control (contraction) joints shall be installed at 60 foot intervals to a depth of 1/4 the pavement thickness. No raveling of the surface will be permitted during the joint installation procedure. Isolation (expansion) joints will not be used, except when pavement is abutting building slabs or other adjoining structures.

5) Testing and Inspection:

a) It is strongly suggested that the owner retain an independent testing laboratory. The testing laboratory shall conform to the applicable requirements of ASTM E-329 "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction" and ASTM C-1077 "Standard Practice for Testing Concrete and Conrete Aggregates for Use in Construction, and Criteria for Laboratory Evaluation" and shall be inspected and accredited by the Concrete Materials Engineering Council, Inc., or by an equivalent recognized national authority.

The agent of the testing laboratory performing field sampling and testing of concrete shall be certified by the American Concrete Institute as a concrete field testing technician Grade I or by a recognized state or national authority for an equivalent level of competence.

b) A minimum frequency of one (1) test for each day of placement shall be conducted to verify the rodded weight of material as delivered. The test shall be conducted in accordance with ASTM C-172 and C-29. The mix shall be within (±5) five pcf of design unit weight. If outside this range, mix proportions shall be modified to comply.

c) At seven (7) days from placement, a minimum of three (3) cores for each placement shall be taken in accordance with ASTM C-42. The cores shall be used for verification of pavement thickness. Subsequent to thickness verification, core ends shall be trimmed to facilitate volume determination. Core unit weight shall be calculated based on weight results when tested in accordance with ASTM C-140 paragraph 14.1 (disregard suspended weight).

Pavement acceptance shall be based on the average unit weight of cores being within ±5 pcf of design weight. The thickness of the pavement recommended is five (5) inches for light traffic loadings. Additional thickness will be required for pavement subjected to frequent heavy axle loadings.

4) Mixing, Hauling and Placing:

a) Truck mixers shall be operated at the speed designed as mixing speed by the manufacturer for 75 to 100 revolutions of the drum.

b) The portland cement aggregate mixture may be transported or mixed on site and should be used within one (1) hour of the introduction of mix water, unless otherwise approved by an engineer.

c) Each mixer truck should be inspected for appearance of concrete uniformity according to preceding Section (2d). Water may be added to obtain the required mix consistency. A minimum of 20 revolutions at the manufacturer's designated mixing speed shall be required following any addition of water to the mix. Discharge shall be a continuous operation and shall be completed as quickly as possible.

d) Placing and Finishing Equipment: Unless otherwise approved by the Owner or Engineer in writing, the Contractor shall provide mechanical equipment of either slipform or form riding with a following compactive unit that will provide a minimum of 10 psi vertical force. The pervious concrete pavement will be placed to the required cross-section and shall not deviate more than $\pm$ 1/4-inch in 10 feet from profile grade. If placing equipment does not provide minimum specified unit weight, a full width roller or other compaction device that will provide a compactive effort to meet unit weight requirement will be used immediately following strike-off operations. After mechanical or other approved strike-off and compaction operation, no other finishing operation will be allowed. If vibration, internal or surface applied, is used, it shall be shut off immediately when forward progress is halted for any reason. The Contractor will be restricted to pavement placement widths of a maximum of fifteen (15') feet unless Contractor can demonstrate competence to provide pavement placement widths greater than the maximum specified to the satisfaction of the Engineer.

e) Curing procedures shall begin within twenty minutes after final placement operations. A fog mist shall be applied prior to covering all surfaces and exposed edges with a 6-mil thick polyethylene sheet for a period of five days. Covering shall be held down securely to prevent dislocation due to high winds or adjacent traffic conditions.

Maintenance

Routine maintenance involves removal of debris that is too coarse to be washed through the pavement system. Vacuuming pavements is required to remove particulates that are fine enough to be carried into the pavement but too large to pass through, thus clogging the void space. Porous pavements require no more repair maintenance than conventional pavements, so maintenance problems can generally be reduced to better "housekeeping" practices on the part of area residents and more efficient street cleaning procedure in municipalities.

To preserve the high filtration rate of the pervious paving, routine inspection and maintenance is required. The surface should be routinely visually checked (preferably after a prolonged storm event) for evidence of debris, ponding of water, clogging of pores and other damage. Any debris should be immediately removed. An annual cleaning program should be instituted that requires a street sweeper with a vacuum to thoroughly cleanse the surface.

Cleaning: It has long been recognized that maintenance and cleaning of porous pavements to prevent or alleviate clogging would be a factor in the application of such pavements. Sections of porous pavement which have been clogged have been cleaned by various methods. No method has been satisfactory on fully clogged pavements, however, and, only a superficially clogged section showing a water penetration rate of 0.1 inches per second compared to a normal water penetration of 0.38 inches per second can be restored to normal operation. The best method for cleaning is brush and vacuum sweeping followed by high pressure water washing of the pavement. In Maryland it has been determined that vacuum cleaning alone, once the pavement is clogged, will be largely ineffective. The oils, especially in porous asphalt, bind dirt, and, only an abrading and washing technique can be effective in its removal. Clogging to a depth of 0.5 inch is sufficient to prevent water penetration.

If, during visual inspection, any ponding or clogging is noticed, the following program should be followed to correct the problem. First, a street sweeper with a vacuum would be used. If ponding persists, steam cleaning with a biodegradable substance can be applied, then vacuum. If the clogging is at a depth greater than 1/2-inch, holes, 1/4-inch in diameter and one (1) foot on-center, can be drilled through concrete pavement. Hand drilling or tandem drill rigs may be used. All drilling debris should be vacuumed from the pavement.

Replacing Clogged Pavement: Once a large area of porous pavement is fully clogged and it cannot be adequately cleaned, the paving must be removed to a depth where the clogging is not evident and new porous paving filled in. In extreme cases, the affected area must be removed and new topping put down. Since these materials are relatively new, obtaining a patching mix suitable

to match the installed pavement may be difficult. Available patching material is usually dense graded at present. If the subbase becomes clogged, the pavement must also be saw cut and removed. Six to twelve inches of the subbase will usually need to be replaced with clean sand, then proof rolled. Pervious paving will then need to be filled in.

SW BMP 3.07

STORMWATER RETENTION BASINS

Definition

The use of infiltration basins (usually dry) to retain stormwater on site thus reducing pollution and improving downstream water quality.

Purpose

To incorporate pollution control and groundwater recharge concepts into the design and construction of storage areas for the percolation of stormwater runoff so that the adverse impact of urban type development on receiving waters can be reduced.





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Conditions Where Practice Applies

Applicability of this practice is primarily dependent upon the availability of an adequate site for a retention area or for modifications of an existing system. Geologic, topographic and soils conditions must be considered in determining site suitability. The most significant limiting factor in many cases is the availability of sufficient land area to provide the necessary storage volume. This is particularly true in densely urbanized areas where land is scarce and property values are high.

The soil and water table conditions must also be such that the system can, in a maximum of 72 hours following a stormwater event, provide for a new volume of storage through percolation and/or evapotranspiration. Retention systems do not release stored waters for surface discharge.

Planning Considerations

Retention ponds are often designed and constructed for a number of purposes other than nonpoint source pollution control. The purpose may be recreation, water supply, recharge, flood protection, aesthetic improvement or any combination. Incorporating pollution control concepts into the design and construction of such impoundments or in modifying existing impoundments can provide added benefits in improved downstream water quality. All elements of any impounding structure must be designed, modified, and/or constructed and operated in conformance with good engineering practice.

Basins are generally open excavated depressions of varying size. They can be located in excess land areas within a road right-of-way, within open land areas of developments, within recreational sites such as playgrounds or athletic fields and within natural or landscaped depressions. Designed for storage and infiltration, these basins can be a practical and economical means of disposing of road or subdivision surface water. Their principle drawback is that they require considerable space. However, where space is available, they may be the least expensive recharge system to construct per unit of water handled.

Retention systems are suitable over much of Florida, but they are particularly desirable in areas with deep sandy soils. Areas in which impermeable or semi-impermeable lenses protect underlying sources of groundwaters may be equally suitable locations. Tests performed as a part of the statewide and regional nonpoint source management programs during the late 1970's show that a substantial amount of the pollutants carried in stormwater including suspended solids, oxygen demanding materials, heavy metals, bacteria, some varieties of pesticides and nutrients such as phosphorus are removed as runoff percolates through the vegetation and soil profile.

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Recently, the percolation of stormwater using on-site retention systems has gathered acceptance. Their appeal is heightened by a widely recognized need to promote the recharge of groundwater to prevent salt water intrusion in the rapidly urbanizing coastal areas of the state. The impact on the quality of underlying groundwaters is a prime concern of the Department. This potential impact must be fully considered in planning a retention system to prevent groundwater contamination. While only a handful of studies have found measurable effects on groundwater quality from infiltration systems, few if any studies have been conducted to evaluate the full range of constituents that may be found in stormwater runoff. Therefore, protection of groundwater remains a primary consideration in the design of retention systems.

As stormwater percolates through the soil into underlying geologic formations, the form and concentration of pollutants will be subject to alteration by a variety of physical, chemical and biological processes. Unless these interactions are well understood and considered in the design of infiltration and seepage facilities, the possibility of groundwater contamination and/or surface water degradation through lateral transmission is always a threat.

The following recommendations should be followed when planning and designing a retention system:

1) Lateral distances between seepage structures and surface waters should be maintained as large as possible (e.g., at least 100 ft. or more) depending upon site conditions.

2) Treatment practices should take greater advantage of the unsaturated zone for attenuation of pollutants. Where feasible, swale conveyances are preferable to curb and gutter systems.

3) "Source controls" of stormwater runoff and its associated pollutants should be used whenever possible. These are easier to maintain and have less potential for problems than do large structural treatment and storage devices which concentrate runoff at the downstream end of a project prior to discharge. As the name implies, source controls are designed to control pollutants before they enter the storm sewer or other conveyance system. To ensure adequately diffused pollutant concentrations once they enter an aquifer it is wise to avoid configurations which concentrate pollutants. A number of small retention facilities would be preferable to a single large facility in areas where the aquifer is shallow and relatively unprotected from materials which can percolate down from the land's surface.

4) When possible, the bottom of retention facilities should be at least three feet above the mean high water table elevation and any limestone or other water conducting strata. This will ensure sufficient vegetation and soil to promote pollutant removal and improve the hydraulic capacity of the system.

5) Seepage systems should not be located in close proximity to drinking water supply wells. Chapter 17-22, F.A.C. requires stormwater treatment facilities to be at least 100 feet from any public water supply well.

6) Industrial and commercial land uses may have unusual contaminants in the stormwater runoff. This can lead to uncertainities about the amount and type of constituents this water is likely to contain and the control practices that may be necessary. Stormwater discharges that include synthetic organic compounds such as solvents (e.g., from marine maintenance areas, airport, etc.) should be monitored for several storms before final stormwater management plans are made. This is particularly important in any areas where the aquifer is shallow and must be protected. The presence or absence of pollutants that might not be treatable via filtration through the soil, sand or limerock should be established prior to designing a treatment system. In such instances the physical, chemical and hydrologic properties of the pollutant may be known and an effective scheme could be devised to increase the effectiveness of the system to treat it. For example, pollutants that may be soluble but volatilize rather quickly in aerobic conditions could be prevented from entering the groundwater system by increasing the turbulence associated with the conveyance system prior to reaching the retention facility.

7) The use of sinkhole depressions to provide stormwater treatment should be avoided. There are several areas in Florida where active subsurface erosion of the underlying geological formations is common. Experience shows that large deep impoundments may experience problems with sudden and unexpected collapse. The result is a direct discharge of stormwater pollutants directly to the aquifer. Therefore, using areas which are showing signs of Karst activity for stormwater disposal would be unwise. The state groundwater rule (Chapter 17-4.245, F.A.C.) specifies that stormwater must be treated to primary and secondary drinking water standards prior to direct discharge to groundwater.

Special Planning Considerations for Karst Sensitive Areas

The Floridian aquifer is the drinking water source for much of the population of Florida. In parts of the state the limestone that contains this aquifer is near the land surface, only a few inches or feet away from potential pollutant sources and possible contamination from stormwater containing metals, bacteria, and petroleum products.

The Floridian aquifer has a greater potential for contamination from surface pollutant sources in portions of some counties than within the rest of the state. The hydrogeology and geology is the basis of this sensitivity. These areas are sometimes referred to as "Karst Sensitive Areas". Karst is a geologic term used to describe areas where sinkhole formation is common and

the landscape or topography is strongly influenced by the solution of limestone.

The highly porous limestone formations which make up the Floridian aquifer are usually overlain by tens to hundreds of feet of sands, clays, and other material. This cover acts as a buffer, isolating the Floridian aquifer from surface pollutants. Surface water seeps through this material slowly which allows filtration, adsorption and biological removal of contaminants.

However, in the "Karst Sensitive Areas" the limestone which contains the Floridian aquifer exists at, or very near the land surface (Figure 6-28). The absence of cover material allows rapid movement of surface water into the aquifer with little treatment. These regions are areas of high recharge for the Floridian aquifer.

A factor which makes the "Karst Sensitive Areas" particularly prone to stormwater contamination is the formation of a unique type of geologic condition called a solution pipe sinkhole. Solution pipes are common in Florida and they form due to the collapse of surficial material into existing long, vertical cavities that have been dissolved in the upper portion of the limestone. In most cases, the solution pipes are capped by a natural plug of sands and clays as illustrated in Figures 6-28 and 6-29. However, if the cap is washed out or it collapses, the resulting solution pipe sinkhole (Figure 6-30) can act as a direct avenue for the movement of stormwater into the Floridian aquifer.

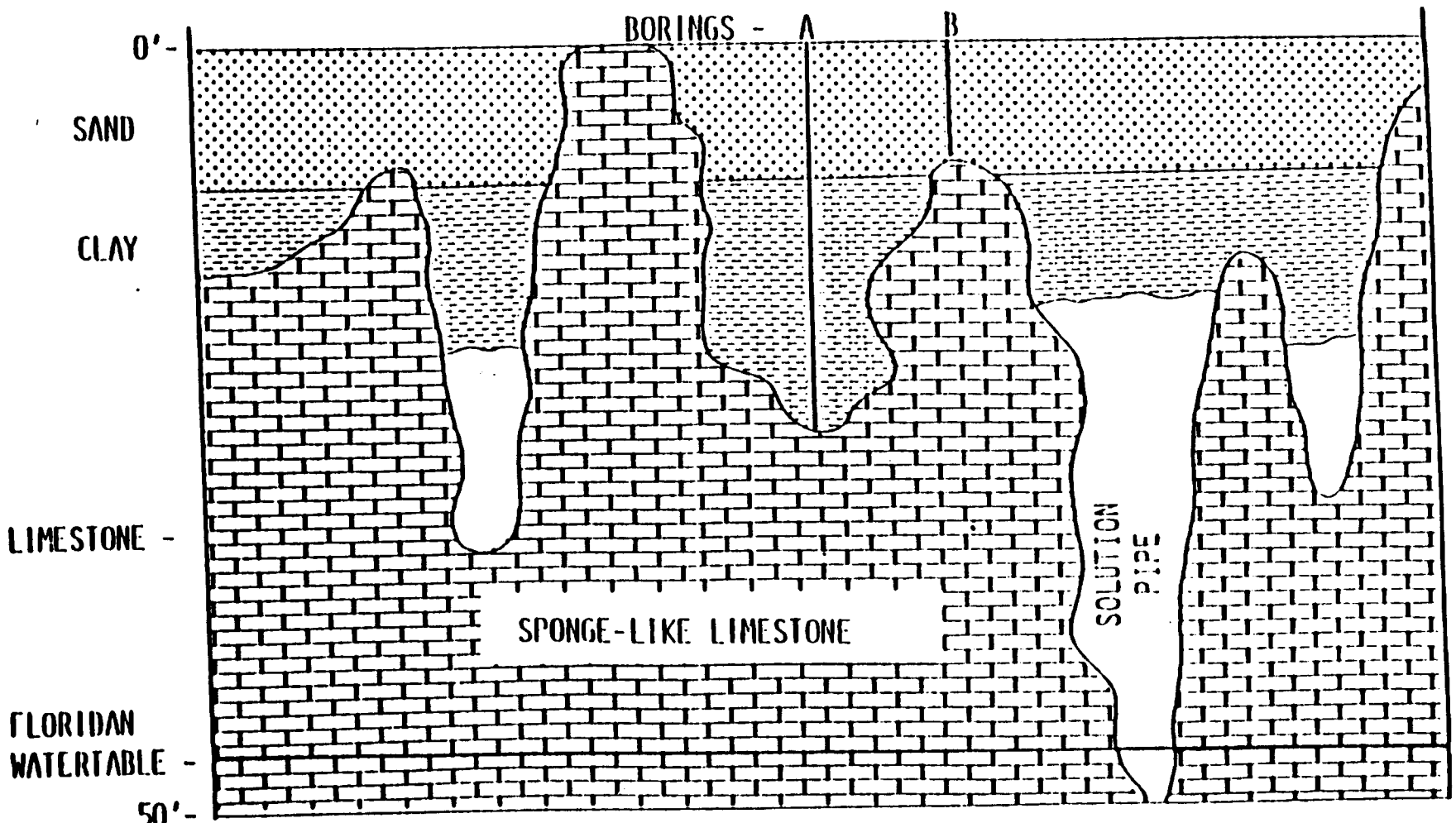
Solution pipe sinkholes often form in the bottom of stormwater retention basins where the capping plug is thinner due to partial removal. The storage of large quantities of stormwater in the basins can also cause a greater hydraulic pressure which can promote washing out the plug in the solution pipe. The resulting cavity acts as a natural drainage well capable of evacuating large stormwater basins within a few minutes to several hours following a storm.

Experience has shown that the installation of stormwater facilities in Karst areas requires special site information and design features to assure protection of the groundwater system. Additional site survey information recommended is discussed later in this write-up (see "Surveys and Investigations Required"). Special design considerations that should be followed are listed below:

1) A minimum of three feet of unconsolidated soil should be provided between the surface of the limestone bedrock and the bottom and sides of a retention basin. As a substitute the designer may wish to use an impermeable liner or excavate and backfill with suitable soil. These provisions can give reasonable assurance of adequate

FIGURE 6-28

Generalized Geologic Section in Karst Sensitive Area



Source: St.Johns RiverWater Management District, May 1988.

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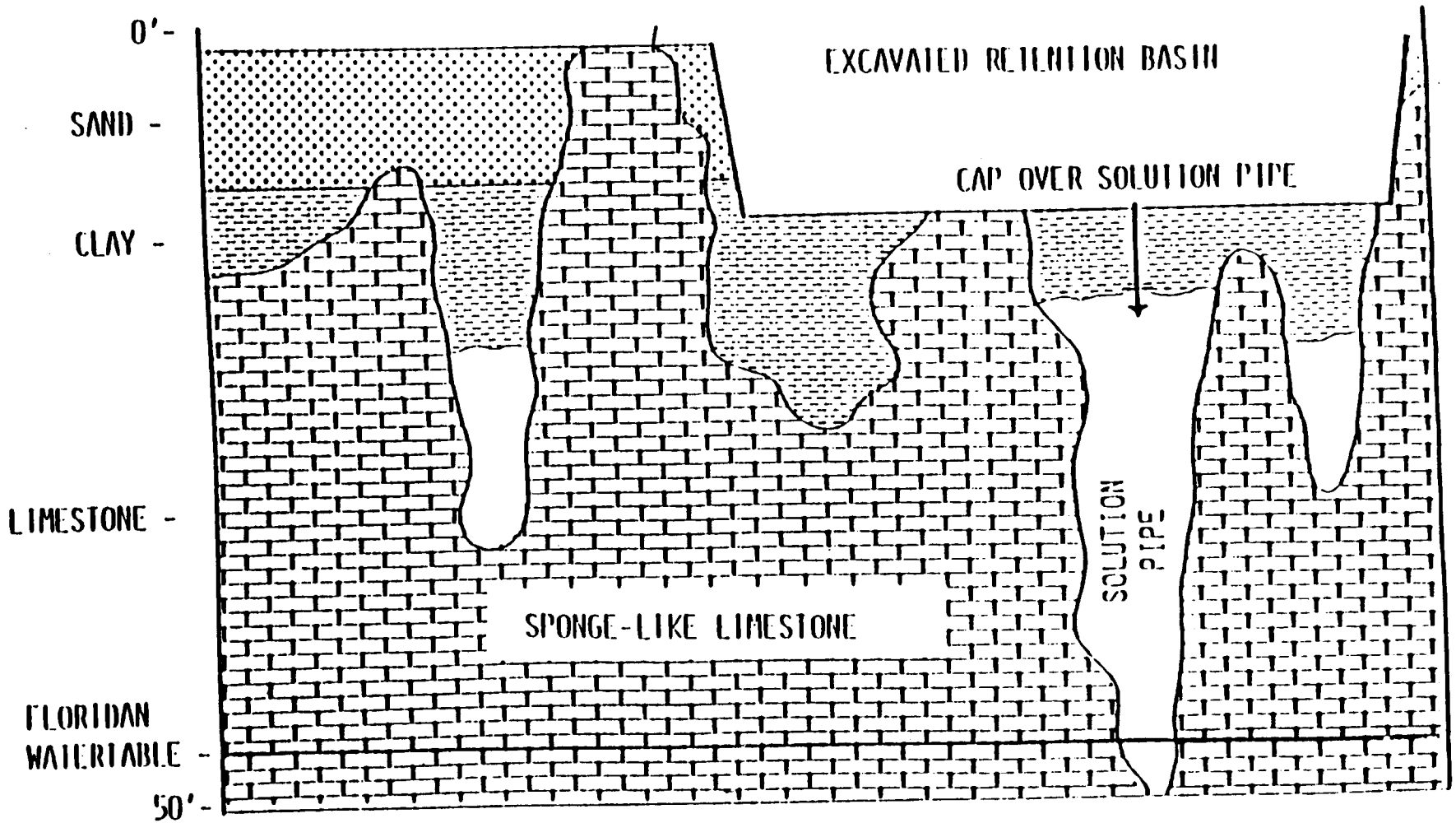
FIGURE 6-29

Karst Sensitive Geologic Profile Illustrating Conditions
Following Excavation of a Retention Basin



Source: St.Johns River Water Management District, May 1988.

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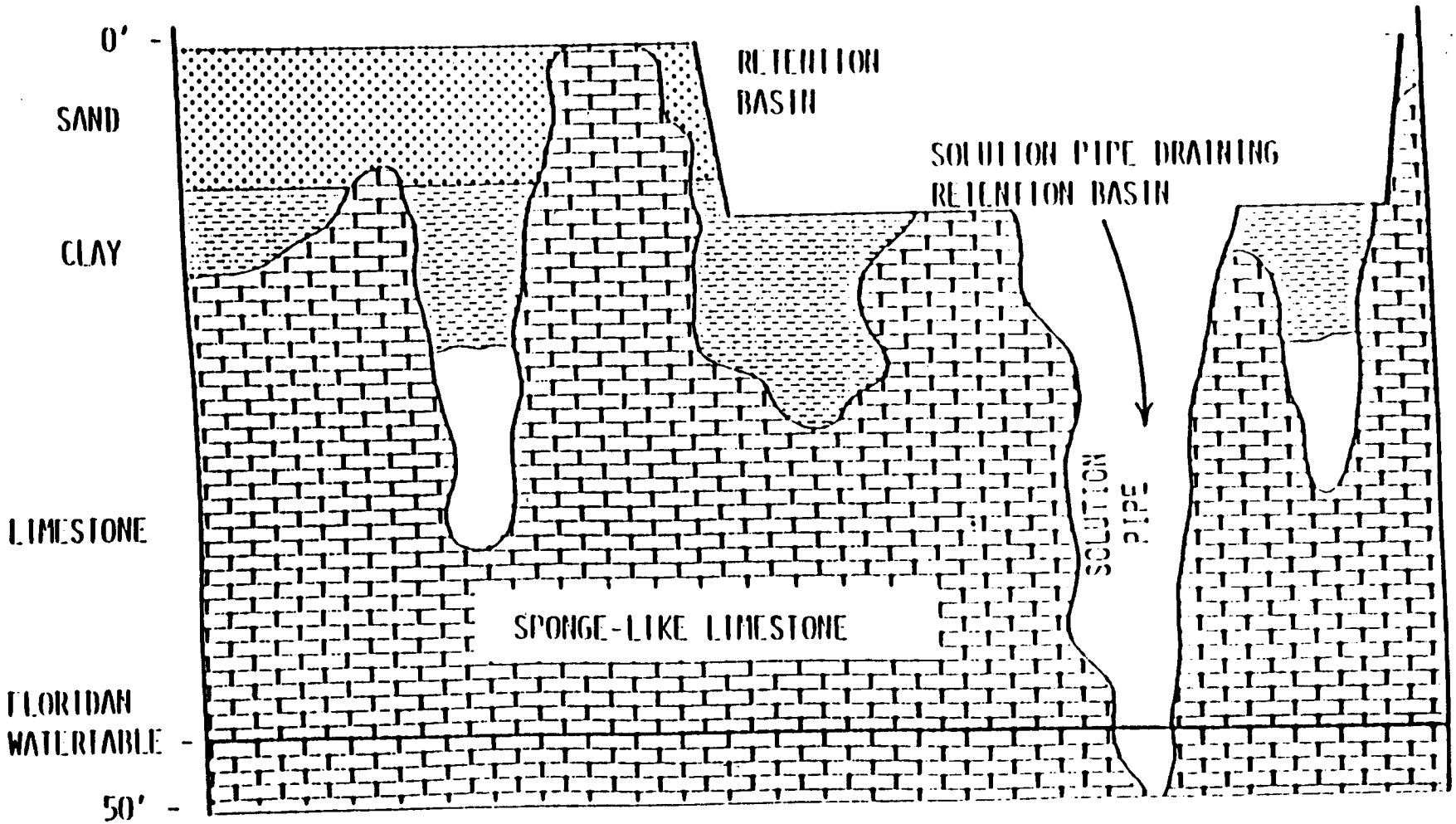
FIGURE 6-30

Generalized Geologic Profile Illustrating
Solution Pipe Sink Hole Formation Associated with Retention Pond Operation



Source: St.Johns River Water Mar ement District, May 1988.

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treatment of the stormwater before it enters the aquifer or ensure that the stormwater is isolated from the groundwater.

2) The basin depth should be as shallow as possible with a flat bottom (no deep spots). The maximum depth recommended is ten feet. This reduces the potential for solution pipe sinkhole formation caused by a large hydraulic head. If limestone bedrock is within thirteen feet of land surface the requirement listed in #1 above will apply. This criteria (#1) will restrict maximum basin depth to less than ten feet in many cases.

   In areas where peak discharge controls are also in effect to reduce the potential for down gradient flooding, a dual pond system is preferred. The first flush of runoff should be treated in shallow (generally less than two feet deep), grassed retention areas. These retention areas should be incorporated into a project's open space/landscaping. Rather than concentrating the runoff into one large retention area, several small retention areas should be used.

3) The side slopes and bottoms of all dry retention basins must be fully vegetated. Vegetation plays a critical role in the removal of contaminants from stormwater and stabilization of side slopes. However, in the "Karst Sensitive Areas" droughty, highly alkaline soils are common. These conditions may prevent successful establishment of commonly used grasses such as bahia.

   Saint Augustine grass can tolerate high alkalinity and brief inundation. However, it is <u>not</u> drought resistant and irrigation will be required to foster a healthy cover during dry periods between storms.

   Bermuda grass can grow in alkaline conditions, is drought tolerant, and can stand brief inundation. It is also a low maintenance species which provides excellent cover and soil stablilization. Bermuda grass grows in a thick mat, eventually covering all exposed soil. It recovers quickly after extended periods of low rainfall. Mowing is rarely required because bermuda creeps laterally rather than growing vertically. Seed is available commercially and is inexpensive.

4) Pretreatment for stormwater prior to entering the retention basin should be designed into the system whenever possible. Pretreatment of stormwater by using sheet flow, swales, off-line landscape infiltration areas, or other measures can remove a large percentage of the pollutants (up to 90%) that are contained in stormwater.

5) Projects in areas zoned for industrial land uses shall assure that industrial pollutants do not enter the stormwater system or come in contact with groundwater. Developments permitted in areas zoned for industrial land use should receive more detailed review to assure that they comply with these requirements.

Design Criteria

General: All facilities which either temporarily or permanently impound runoff waters shall be designed to be stable during construction, and operation. The facility should be safe against overtopping during the appropriate design flood (including consideration of wind and wave action) established according to the damage potential classification, size, height of embankment and so forth. The design procedures, criteria, and manuals currently used by the United States Army Corps of Engineers, the USDA Soil Conservation Service, the U.S. Department of Interior Bureau of Reclamation, or others approved by the Department or local Water Management District may be used for appropriate references in performing these analyses. Seepage forces through the embankment foundation and abutments should be evaluated to ensure against internal erosion and sloughing. Likewise, the design should include provisions to protect the upstream slope, crest and downstream slope of earth embankments from erosion due to rain, wind and wave action.

Calculating Retention Volume

Retention facilities built in accordance with Chapter 17-25, F.A.C. must have the capacity to store and percolate either the runoff from the first inch of rainfall or (a minimum of) the first one-half inch of runoff within 72 hours. Small watershed areas (e.g., those of 100 acres or less) are only required by the department to provide for the minimum first one-half inch level of retention. However, some local review agencies may require greater retention levels.

a) Storage and Treatment of the First One-Half Inch of Runoff: The use of a retention facility is usually associated with some sort of diversion system, usually controlled by hydraulic techniques, thus requiring no energy consumption. Since retention depends primarily on soil percolation rates, the soils in the vicinity of the pond must be tested to determine infiltration rates and to locate the water table depth. Procedures to determine the infiltration rate are discussed in Appendix 6-2.

Most often, the design of retention systems is based on a specified diversion volume. Based on extensive field investigations and simulations using 20 years of rainfall data, average yearly pollutant removal efficiencies were estimated for fixed diversion volumes for on-site (small) watersheds as presented in Table 6-11. The diversion depth is the depth of runoff water which must be stored and percolated from the total watershed (contributory

area) to achieve the treatment level.

Table 6-11
Efficiency Percent Vs Retention Volume

% Eff/Ret	Diversion Depth (DI) in.
99	1.25
97	1.00
95	0.75
90	0.50
80	0.25

Assuming that a retention basin will percolate stormwater before the next storm event, a volume of storage can be calculated using the following formulas:

$$V_m = \frac{A \times DI}{12}$$

where:

V_m = minimum basin volume (acre-feet)
A = contributing watershed area (acre)
DI = diversion volume from Table 6-11 (.5 inches as specified by 17-25 F.A.C.)
12 = conversion factor (in/ft)

Example Problem: What is the minimum retention volume in acre-feet for a watershed of 24 acres if the diversion depth is one-half inch?

The Volume is:

$$V_m = \frac{(0.5)\ (24)}{12}$$

V_m = 1 Ac.Ft.

b) Storage and Treatment of the Runoff From the First Inch of Rainfall (Rational Method): The previous procedure is used for small projects less than 100 acres in size where the value of DI required to satisfy state retention storage requirements is one-half inch. Larger projects with a runoff coefficient greater than (C=0.5) would calculate storage volume a

little differently. In tnese instances, the volume of storage may be computed from a modified form of the basic rational formula:

$$V_m = \frac{CAR}{12}$$

where:

V_m is the required volume of basin (acre-feet)
C is the rational runoff coefficient as defined in Chapter 5
A is the contributing drainage area (acres)
R is the total rainfall (inches)

To meet state stormwater rule requirements, the value of R is equal to one inch.

The two sizing procedures discussed above are simplistic, easy to use procedures. They provide the engineer with the minimum basin volume that is required to satisfy the intentions of state stormwater treatment standards. However, it should be noted that the procedures were developed quite sometime ago (1977-1978) during the initial phases of the state nonpoint source pollution control program. The initial evaluation of pollutant removal efficiency and diversion volume required to achieve water quality objectives was based primarily on statistical analyses of rainfall event magnitude and duration. The results, summarized and illustrated in Table 6-11, were viewed as a first indication that high efficiencies of pollutant removal were possible by diversion and retention of the first one-half inch of runoff or the runoff from the first inch of rainfall.

While it may outwardly appear that this high degree of treatment can be ensured by simply providing storage for the first inch of rainfall, it should be recognized that these efficiencies and criteria are valid only to the extent that all storms equal to or less than the stated amount will be stored and treated. Likewise, a facility must treat the initial runoff volume from those events exceeding the treatment level and only that amount in excess of this first flush may be discharged without treatment. A number of factors including the method of calculating runoff, antecedent moisture condition, the infiltration rate, the time variability between rainfall events, the size of the watershed and the basin depth (deep basins require a longer time to drain) affect the actual treatment efficiency and thus the storage volume required for a basin to actually achieve 80% treatment. Consequently, Dr. Wanielista, of the University of Central Florida later developed a series of design equations, based on water quality and quantity research actually conducted in the field. These procedures are suitable to estimate storage volumes needed to achieve 80 to 90% pollutant removal for a wider range of watershed sizes and conditions.

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c) Storage Volumes Based on Wanielista Design Equations: The following design equations were developed for shallow basins (5 ft. deep) and two removal efficiencies.

TYPE A SOILS

80% efficiency $V_I = 0.016\ A^{1.28}$ for impervious watershed

90% efficiency $V_I = 0.046\ A^{1.18}$ for impervious watershed

$V_5 = V_I(0.59 + 0.37\ CN/100)$ for composite land use

Volume requirements can be reduced for basins less than five deep. The following equation is based on values of V_5 for composite land use areas or V_I for totally impervious projects. It should be noted that the value of V_m for the appropriate treatment efficiency or diversion volume as determined from Tabel 6-11 must also be calculated when using the following equation:

$$V_D = V_m + \left(\frac{V_5 - V_m}{4}\right)(D-1) \text{ when } 1 \leq D \leq 5$$

$$V_D = V_m \text{ when } D < 1$$

where:

V_I = basin volume at 5 foot depth for impervious areas (acre-feet)
V_D = basin volume at depth D (acre-feet)
V_m = minimum basin volume (acre-feet)
V_5 = basin volume at 5 foot depth for composite land use area (acre-feet)
D = basin water depth (feet)
A = drainage area (acres)
CN = average curve number (soil moisture II condition).

Example Problem:

A project has 30 acres of watershed area and a composite CN number of 80. Using the Wanielista Design Equations, calculate the size (acre-feet) of a 5 foot deep retention pond necessary to provide up to 90% treatment.

Step #1: Determine the value of (V_I)
90%: $V_I = 0.046\ (30)^{1.18} = 2.55$ ac.ft.

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Step #2: Calculate (V_5) for tne composite land use situation

90%: $V_5 = 2.55\ (0.59 + 0.37\ (80/100)) =$ 2.26 ac.ft.

Similar equations were developed for Class D soils. However, tne data base used to derive this formula was severely restricted due to the inherent unpopularity these systems enjoy in areas where percolation is restrictive. In such circumstances, land area required to stay within drawdown limits usually will render such systems non-cost effective. Soil replacement with more permeable material, underdrains or stormwater filtration facilities, or wet detention systems are economically more feasible in most urbanizing situations with such soil conditions. As a result, the equations for this circumstance are not included in this write-up.

Dr. Wanielista's design equations for low runoff potential (Type A) soil conditions were used to evaluate how the "rational method" and "SCS CN Method" and the one-half inch treatment criteria compare in respect to providing the storage volume estimates needed to ensure 80 to 90% treatment capacity. The results are illustrated in the following table. The analysis was based on the assumption that a rational coefficient of .64 is equivalent to curve number (CN) of 75, AMC-II.

Storage Volume (Acre - Feet)

Area	(1) 80%	(2) 90%	(3) Rational Formula	(4) SCS CN Method	(5) V_m 1/2"
10	0.26	0.60	0.53	0.025	0.42
50	2.08	4.03	2.67	0.125	2.08
100	5.04	9.14	5.33	0.25	4.17

1) Vol. (Ac. Ft.) for 5' deep pond, composite land use, 80% efficiency Design Equation

2) Vol. (Ac. Ft.) 5' deep pond, composite land use, 90% efficiency Design Equation

3) Volume with Rational Formula (e.g., 0.64 x 10 ac. x 1 in. rain x 1 ft/12 in. = .53 Ac.Ft.)

4) Vol. = Runoff depth for 1 in. rainfall (R) x Area (Ac) x 1/12; where, $[R=(P-.2S')^2/P+.8S']$ & [S' = (1000/CN)-10] & [P = 1 inch] (e.g., .03 in. x 10 Ac. x 1 Ft/12 in. = .025 Ac.Ft.)

5) V_m = Retention volume associated with the first 1/2-inch of runoff (minimum basin volume)

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As can be seen, both the rational method and the half inch diversion criteria generally work to ensure 80 to 90% removal. However, as the watershed increases in size to the 100 acre cutoff, the half inch diversion requirement gradually begins to fall short on providing sufficient storage volume to satisfy the 80 to 90% treatment intended by Chapter 17-25 F.A.C.. Therefore, the half inch diversion volume procedure for sizing retention areas is allowable for drainage areas up to and including 100 acres in magnitude. Larger areas with (C) values in excess of (.5) must provide storage for the runoff from the first inch of rainfall as calculated with the rational method.

Use of the SCS composite curve number method for sizing these systems results in a greatly undersized basin as illustrated in the table. Therefore, this procedure is not allowable for these purposes.

The Wanielista Design Equations can be used for watershed sizes up to 500 acres in size. Beyond 500 acres a linear relationship can be used which relates size of retention in multiples of those calculated for 500 acres. The designer should also be advised that whenever the value of V_m, based on 90% treatment (e.g., DI = 1/2" from Table 6-11) exceed the value of V_I calculated using the design equation, the designer should consider V_m equivalent to the minimum basin volume allowed for any depth and abandon use of the equation in favor of the more simplified approach.

The Wanielista design formulas and the rational formula do not consider the shape or the time of concentration of a watershed. However, the spatial variation of time of concentration can be an important parameter in the routings of stormwater runoff, and the level of treatment expected given a specified diversion volume, especially for larger watershed areas. As the first flush of stormwater pollution from the upper reaches of a watershed mixes with runoff from the longer reaches, it is generally diluted. This is because the first flush from the lower reaches has already passed by and the runoff from the lower watershed area is now relatively "clean". The design of a stormwater drainage system should take into account the implications of routing of the first flush to the retention pond. This evaluation can also be beneficial in the site selection process of the pond itself.

Large narrow watersheds can be expected to have a long time of concentration compared to more compact drainage areas. They may also be expected to produce long, drawn out hydrographs. Due to the extended time it takes water from the upper reaches of the drainage area to reach the outlet, only a small percentage of the runoff waters are contributing to flow at any point in time. During a storm, such watersheds display the unit hydrograph characteristics illustrated for the curve marked K = 0.1 in (Figure 6-31).

Other watersheds are more effective in their delivery processes. At any point in time during a storm, the ratio of flow at the point of interest when compared to the total instantaneous runoff from the entire watershed or contributing area will be much higher than in the first instance. These

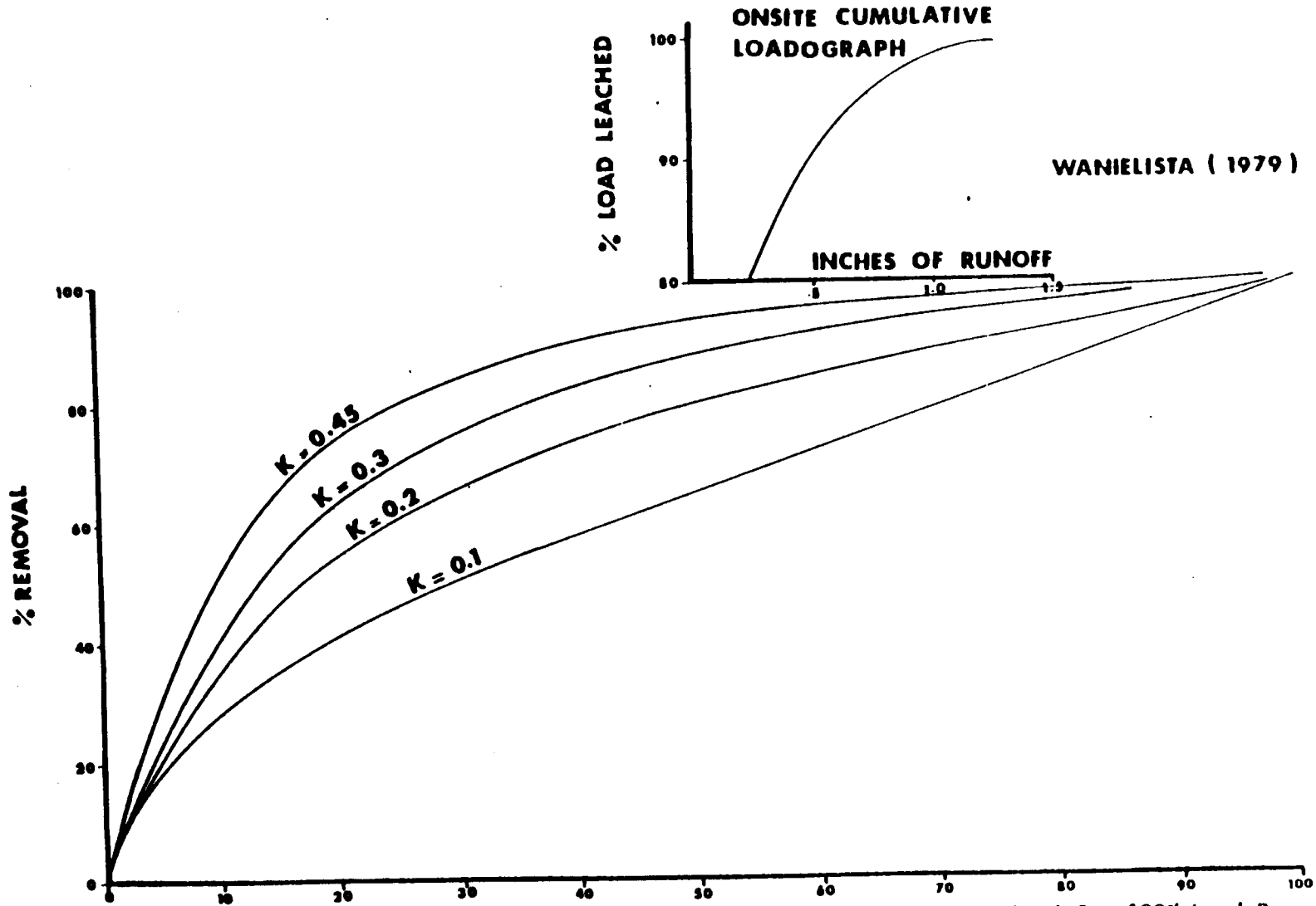

FIGURE 6-31

Variation in Potential Pollutant Removal Associated with Watershed Response and Unit Hydrograph Shape Factor (K)
(after Wanielista, 1981. "Stormwater Management Manual")

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watersheds have hydrograph shape characteristics similar to curve K = 0.45. Nearly 90% of the runoff from the entire watersned may be observed at the outlet during the first flush producing period.

The important point to consider in this discussion is the following:

> If it is determined that 80% pollutant removal must be acheived, then 75% of the first 1.25 inches of runoff (0.94 inches) must be retained for the watershed with the unit hydrograph described by K = 0.1 (Figure 6-31). However, for the watershed with a unit hydrograph described by K = 0.45 only 25% of the runoff (0.31 inches) must be retained to yield the same pollutant removal efficiency. This analysis is based on the assumption that nearly 100% of the pollutant mass will be removed by retaining 1.25 inches of runoff as illustrated in the small graph at the top of Figure 6-31.

Research is needed to develop design aids that will enable the engineer to easily determine the probable inflow unit hydrograph shape associated with any individual retention facility. In this manner, more detailed information similar to that illustrated with this figure may be developed for various land use types and regions of the state. Such data could be used to obtain a better estimate of storage requirements needed to accomplish an intended level of treatment.

Estimating and Evaluating Drawdown Time Requirements

The state regulation specifies that retention facilities must be capable of providing a new volume of storage within 72 hours following a storm. For facilities designed for multiple purposes (recreation, open space, etc.) this time should be a maximum of 24 to 36 hours, however.

For systems in which the water table elevation is below the bottom of the retention basin the drawdown time (T) may be estimated very simply. Percolation or infiltration in a retention basin produces an infiltration hydrograph (time-variable) which describes the draining of the basin. The rate of outflow will be in accordance with Darcy's Equation which is discussed in more detail in the FILTERS AND UNDERDRAINS (SW BMP 3.20). The equation may be written as follows:

$$Q = KiA$$

where:

Q = rate of seepage or percolation from the facility
K = hydraulic conductivity or percolation rate associated with the soil in the vicinity of the facility
i = hydraulic gradient or the loss of hydraulic head per unit distance of flow
A = area of the soil profile through which infiltration is occurring

When the water table is below the bottom of the basin, the entire surface area of the facility is available for percolation. The average area (A) may be determined by dividing the volume by the depth of the holding area. Assuming a hydraulic gradient of unity (e.g., i = 1), which is a conservative assumption, the rate of outflow may be calculated once the permeability (K) is established using appropriate field testing procedures. A discussion of these tests is included in Appendix 6-2. The final or constant rate established from these testing procedures must be used, not the initial rate encountered shortly after the beginning of a test run.

Subsequently, drawdown time (T) may be determined by dividing the storage volume required for the facility (e.g., one-half inch runoff volume or other appropriate value) by the rate of percolation (Q) from the facility as established from Darcy's formula. The appropriate expression is shown below where all terms are as previously discussed in this paragraph.

$$T = Vm/Q$$

Special Procedures for Estimating Drawdown Time in High Water Table Areas

There are many areas in Florida where retention is not an economically feasible alternative. The most common limitations are restrictive soil layers in combination with flat terrain, poorly defined surficial drainage systems, and limited elevation differences which severely restrict the movement of water. In most instances, designers elect to use wet detention systems or filters and underdrains to provide the prescribed level of stormwater quality treatment. However, there are always those who, for one reason or another, wish to try anything including retention in high water table areas. The following excerpts and figures from the document titled "Underground Disposal of Stormwater Runoff, Design Guidelines Manual," (FHWA, 1980) will serve to illustrate a method for evaluating outflow for lateral flow cases. It also, very vividly, demonstrates some of the problems one may expect to encounter in these situations.

> Darcy's Law and flow nets are two useful methods for analyzing potential infiltration rates when the permeabilities of the formations are reasonably well known. Some theoretical solutions to seepage problems may be too rigorous for the assumptions that are made in the derivations and may fit actual cases only approximately. Most engineers experienced in seepage calculation feel that it is far better to make use of an approximate method than to rely on a rigorous theoretical formula that is not easily understood and which represent only a crude approximation of true conditions due to questionable assumptions. Some simplified procedures illustrated in Figure 6-32 are discussed in the following paragraphs.

a. Vertical Flow Case

In Figure 6-32a an infiltration basin is shown in soil formations having a vertical permeability (K) of 1 ft/day (3.5×10^{-4} cm/sec). An impervious stratum is located at 20 ft. depth (6.1 m), and a natural water table at 10 ft. (3.05 m). What is the capability of the site for vertical discharge of water? From Darcy's Law, Q = KiA, the flow can be estimated from the vertical permeability of 1 ft/day (3.5×10^{-4} cm/sec) and a downward hydraulic gradient of 1.0 (conservative assumption). Hence; Q = 1.0 ft/day (1.0) = 1.0 ft/day/sq ft (3.28 m/day/m^2). For a 300-ft (91.5 m) wide basin, the possible Q is 300 cu ft/day/linear foot (27.54 m^3/day/m).

b. Lateral Flow Case

Many sites that are capable of relatively large disposal rates when the underlying water table is low, become relatively useless if the water table is high and flow is lateral. Figure 6-32b illustrates the flow conditions at the edge of a basin where the groundwater mound has risen to the bottom of the basin. The flow net gives the shape factor, n_f/n_d, which is used in the following expression to estimate lateral seepage:

$$q = kh(n_f/n_d)$$

The equation is the conventional formula for estimating seepage quantities with flow nets. The seepage quantity per linear foot is q, under net head h, while n_f is the number of flow channels in the flow net, and n_d is the number of equipotential drops. In this example, assuming a horizontal k = 5 ft/day (1.53 m/day), and a head of 20 ft (6.1 m), with the shape factor of n_f/n_d = 1.1/20, the seepage quantity is:

$$q = kh(n_f/n_d) = (5 \text{ ft/day})(20 \text{ ft})(1.1/20)$$
$$= 5.5 \text{ cu ft/day/foot } (0.50 \text{ m}^3\text{/day/m})$$

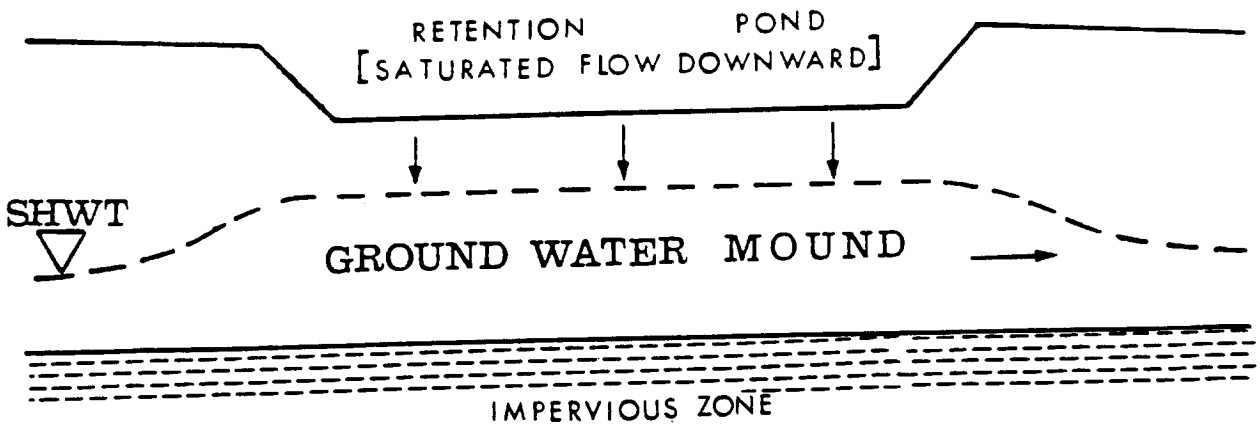
The potential for lateral flow from this basin is only about 2% of the vertical flow capability; even though the assumed lateral k is 5 times the vertical k. When estimates of infiltration are made, designers should recognize that they are only approximate and should try to use conservative assumptions so as not to overestimate the capabilities of infiltration systems.

Surveys and Investigations Required

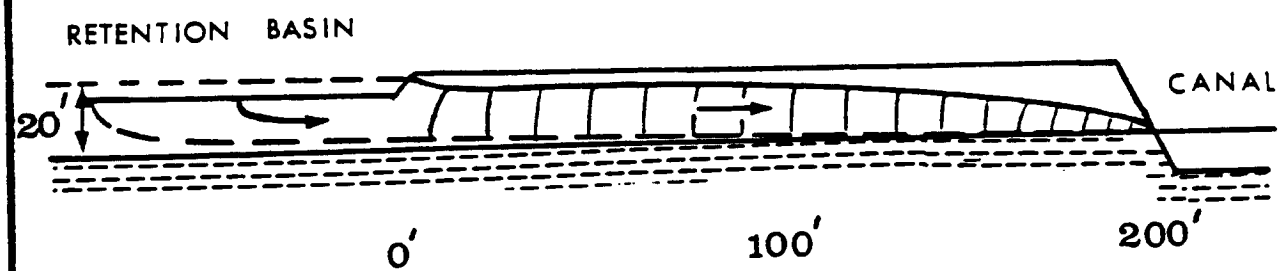
At a minimum it will be necessary to determine the infiltration rate of local soils using procedures defined in the Appendix 6-2 of this chapter. This

FIGURE 6-32

Schematic of Flow Characteristics
Associated with Infiltration From Retention Ponds
During Low and High Water Table Conditions (After Hannon 1980)



a) An example of downward flow from a retention basin in an area where the seasonal high water table (SH WT) is well below the pond bottom.



b) An example showing the flow net diagram associated with lateral flow during conditions when the water table is high and above the pond bottom.

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information is needed to evaluate drawdown time. Provided the location of the treatment facility is flexible, this type of data is also valuable for situating the facility where it may function the most advantageously.

For large watersheds, it is advisable to develop a discharge time relationship for the drainage area. In order for this task to be accomplished, sufficient topographic information and data pertaining to the type and condition of the vegetative cover at the site must be available in order to estimate the time of concentration of the watershed. This information is required in order to evaluate the effect which hydrograph shape may have on treatment efficiency as discussed in the preceding section of this write-up.

In areas of active sinkhole formation natural depressions should be used for stormwater management only when hydrogeologic evidence shows that the subgeologic structure and soils are stable and unlikely to form a conduit that creates a direct connection to the groundwater. Soil boring information and/or supplemental data such as ground penetrating radar may be required to verify the geologic stability.

A complete hydrogeologic survey is recommended for the entire site with emphasis on potential locations of swales and especially excavated basins. A map depicting limestone outcroppings, sinkholes, solution pipes, and general depth of soil to limerock can help to avoid problem areas when locating the components of the stormwater treatment system. Borings taken in potential locations of swales and basins should be made to the limestone and then an additional ten feet deep. The overburden material shall be characterized and this information should be used to site swales and retention areas in locations with the most protective soil profile and the "strongest" limestone.

The site survey should be in sufficient detail to allow the permitting authority to be able to fully assess the potential for groundwater contamination that may be associated with a proposed project. In most cases the applicant should be prepared to submit:

1) Geologic sections describing the substrate through the retention basin area.

2) A description of any existing limestone outcrops and any Karst features, (i.e., sinkholes or solution pipes) at the project site.

3) A description of all groundwater levels and flow at the site.

4) A description of the site's topography before and after the project construction including information on any surface water drainage features.

5) An inventory of existing wells within a 1000 foot radius of the stormwater basin.

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Construction and Design Considerations

General

Both surface and below ground retention systems are common in Florida. A schematic of an off-line retention pond with a diversion is shown in Figure 6-33. Exfiltration trenches (SW BMP 3.03) are the most common subsurface retention device currently used in various regions of the state.

Regardless of the type of infiltration system to be constructed, careful consideration should be given to the effects that the design work sequence, construction techniques, and equipment employed will have on future operation and maintenance of the system. Serious problems can be averted, or in large part mitigated, by the adoption of relatively simple measures during the design and construction phase.

Surface Percolation (Retention Pond) Construction and Design Considerations

The sequence of various phases of basin construction has an identifiable relationship to the overall project construction schedule. An ideal program would schedule rough excavation of the basin for the rough grading phase of the project to permit use of the material as fill in earthwork areas. The partially excavated basin may serve as a sedimentation basin to assist in erosion control during construction. However, basins near final stages of construction should never be used prematurely for runoff disposal. Stormwater from untreated, freshly constructed slopes within the watershed area will load the newly formed basin with a heavy concentration of fine sediment. Such circumstances seriously impair the natural infiltration characteristics of the site. Specifications for basin construction should state the earliest time that stormwater may be directed to the basin, and the means by which this delay in use is to be accomplished.

Runoff from surrounding land should be intercepted to prevent erosion of the side slopes. Establishment of turf on the basin sides and floor is recommended. A dense stand of turf will not only prevent erosion and sloughing, but will also provide a natural means of maintaining relatively high infiltration rates through the surface. When the basin is adequately maintained, removal of accumulated sediment is a problem only at the basin floor. Little, if any, additional maintenance is normally required to maintain the infiltration capacity of the slope areas.

In design, prevention of scour at the inlet is mandatory as it reduces maintenance problems and aids in establishing a cover crop. Reduction in water energy by providing hydraulic structures and an apron on which water can flow into the pond are effective in reducing scour. A paved stilling basin before discharge into the pond is also effective. If possible, after excavation or earth moving for pond construction, runoff waters should not be permitted to flow into the pond until a cover crop has been established.

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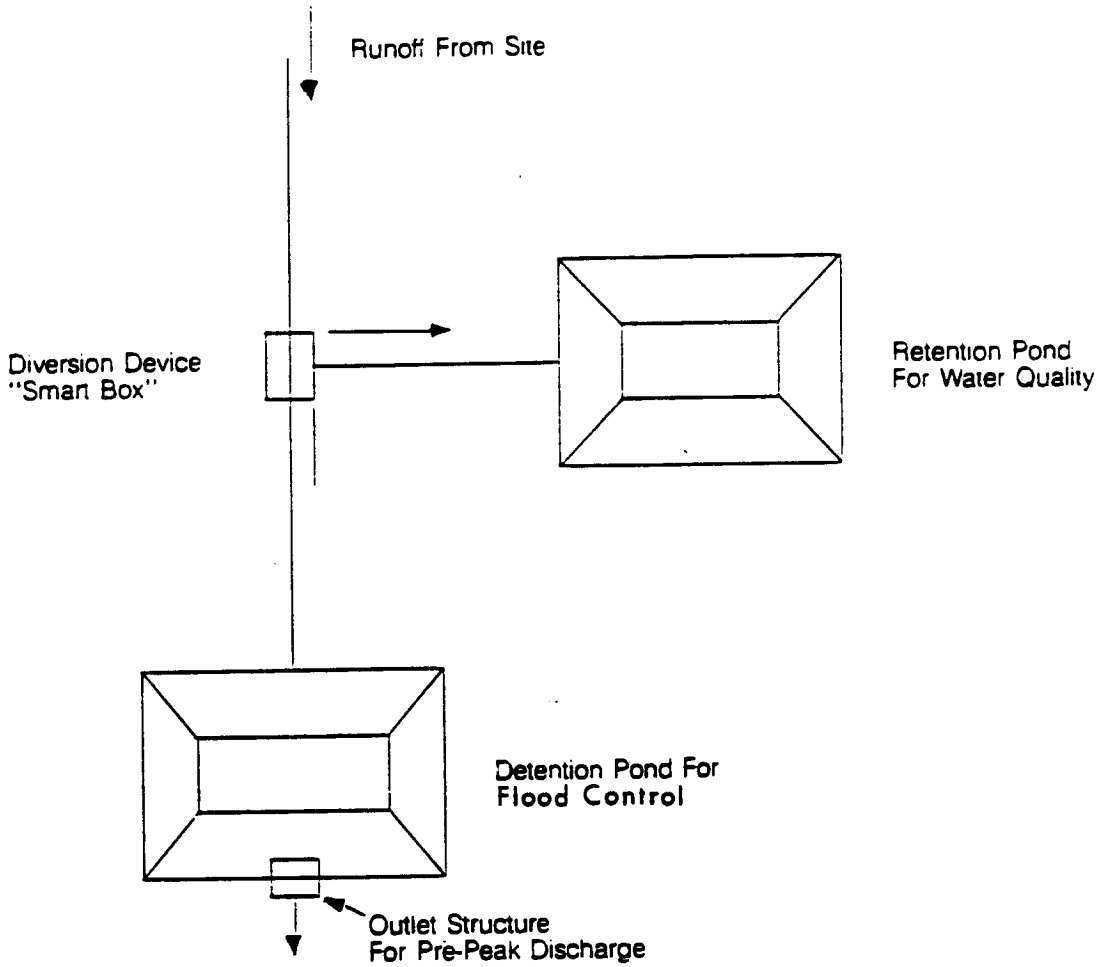
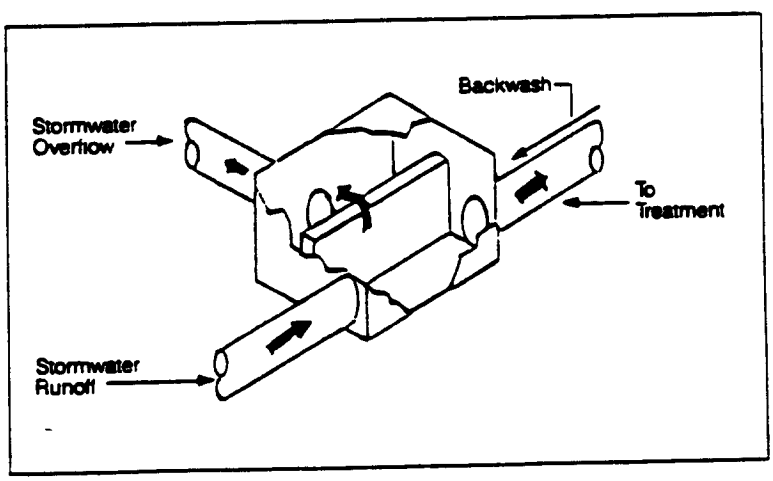
Off-Line Treatment System

Figure 6-33



"Smart" Box Schematic



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Maintenance of side slopes is important. Slopes greater than 2 horizontal to 1 vertical are time consuming, expensive, and dangerous to maintain.

Initial basin excavation should be carried to within 1 ft. (0.3 m) of the final elevation of the basin floor. Final excavation to the finished grade should be deferred until all slopes in the watershed have been seeded and protected with an interim treatment. The final phase excavation should be performed carefully to remove all accumulated sediment. Relatively light equipment is recommended for this operation to avoid deep compaction of the basin floor. After the final grading is completed, the basin floor should be deeply tilled with rotary tillers or disc harrows to open the soil pores and provide a well-aerated, highly porous surface texture for seeding or sodding.

Basin shape depends largely on the configuration of the available site. The shape providing the greatest area will infiltrate water most rapidly. However, an increase in basin floor area may not necessarily bring about a corresponding increase in the rate of infiltration. After operation begins, lateral drainage through the basin wall may become more rapid than vertical percolation should the bottom become less pervious as silt deposits build up.

Some designers tend to compensate by proposing to use deeper facilities since increased depth can provide greater lateral infiltration area. However, basin side slopes should be 3:1 or flatter to prevent erosion, improve appearance and promote easy maintenance. Moreover, deep installations in residential areas should be fenced, and the bank slope should be 4:1 or flatter to allow a point where exit would not be difficult should someone fall into the basin by accident.

As noted earlier, detention or sedimentation basins can be used prior to infiltration basins so that suspended solids will settle out before the water is released into the infiltration basin. These ponds must be large enough to hold storm runoff for a sufficient settlement time. This could vary from one or two hours to a day or more depending on soil type and particle size. In north Florida, where the soil contains considerable amounts of fine textured material of low settling velocity, a sedimentation pond may be larger and shallower than the actual infiltration basin.

Landscaping of infiltration basin facilities creates a pleasing appearance that should always be considered when ponds are located near residential areas. Without landscaping and maintenance, these devices will accumulate the inevitable old tires, shopping carts, broken glass, and trash thus becoming a community nuisance. The landscaped basin can be used as a park or recreation area. However, such a project requires plants, trees and shrubs capable of withstanding temporary inundation. Basin sides should be gently sloped to giave a park-like appearance.

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FIGURE 6-34

Typical Inline Landscaped Retention Area
Used in Conjunction with a Pond for Flood Control



A typical park-type installation is shown in Figure 6-34. It consists of a very shallow well landscaped basin for infiltration of stormwater followed by a detention pond for peak discharge control. During summer months, the grass in these park basins may need to be sprinkled and additional inflow may occur from domestic watering or irrigation.

Infiltration basins are sometimes lined with material to help prevent the build-up in impervious silt deposits on the soil surface. A 6-inch (0.15 m) layer of pea gravel on the basin floor can serve to effectively screen out suspended solids and keep infiltration rates high. The gravel layer can be replaced or cleaned when it becomes clogged. However, planting of grass is probably a more economical alternative. This practice has been shown to extend infiltration efficiency, keep the soil pervious, reduce maintenance due to clogging and prevent erosion.

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Grass serves as a good filter material, particularly the Bermuda variety which is extremely hardy and can withstand several days of submergence. Well established Bermuda on a basin floor will grow up through silt deposits forming a porous turf and thus preventing the formation of an impermeable layer. Bermuda grass infiltration works well with long narrow basins along the fringes of parking areas and highways. Bermuda requires little attention besides summer irrigation during the period of establishment.

Coarse organic material (such as cotton boll hulls, leaves, stems, etc.) is sometimes specified for discing or spading into the basin floor to increase the permeability of clayey soils. The basin floor should be soaked or inundated for a brief period then allowed to dry subsequent to this operation. This is thought to induce the organic material to decay rapidly, loosening the upper soil layer.

Maintenance and Inspection

General

All stormwater systems should be inspected on a routine basis to ensure that they are functioning properly. Major inspections can be on an annual or semi-annual basis, but brief inspections should always be conducted following major storms. Systems that incorporate infiltration are most critical since poor maintenance practices can soon render them inefficient. Procedures for maintenance of these systems are discussed in this section. It should be stressed that good records should be kept on all maintenance operations to help plan future work and identify facilities requiring attention.
In areas of active sinkhole activity a site inspection should be performed by field personnel when the retention basins is excavated to final grade. The objective is to visually inspect for exposed limerock or solution pipes. It is also advisable to follow up with a site visit to assure that vegetation (sod) is growing well and that all construction is according to approved design.

Retention Basins

Infiltration basin surfaces are sometimes scarified to break up silt deposits and restore topsoil porosity. This should be accomplished after all sediment has been removed from the basin floor. However, this operation can be eliminated or minimized by the establishment of grass cover on the basin floor and slopes. Such cover helps maintain soil permeability.

Algae or bacterial growth can also inhibit infiltration. While chlorination of the runoff water can solve this problem, it is more practical to make certain that the basin is permitted to dry out between storms and during summer months.

Holding ponds or sedimentation basins can be used to reduce maintenance in conjunction with infiltration basins by settling out suspended solids or removing oil and grease before the water is released into the infiltration basin.

Chemical flocculants can also be used to speed up settlement in tnese holding or sedimentation ponds. Flocculants should be added to the runoff water within the settlement pond inlet pipe or culvert where turbulence will ensure more thorough mixing. After suspended matter has flocculated and settled in the settling pond, the water may be released into the infiltration basin for disposal. Although chemical flocculants may be impractical for general use, they might well be considered in special cases.

Cleanout frequency of infiltration basins will depend on whether they are vegetated or non-vegetated and will be a function of their storage capacity, infiltration characteristics, volume of inflow and amount and type of sediment load. Infiltration basins should be thoroughly inspected at least once a year. Sedimentation basins and traps may require more frequent inspections and cleanout. These structures should have a prescribed sediment level at which they are cleaned.

Non-vegetated basins can be scarified on an annual basis following removal of all accumulated sediments. Rotary tillers or disc harrows with light tractors are recommended for maintenance of retention basins. Use of heavy equipment should be discouraged to prevent excessive compaction of surface soils. The basin floor should be left level and smooth after the tilling operation to ease future removal of sediment and minimize the amount of material to be removed during future cleaning operations. A leveling drag, towed behind the equipment on the last pass, will accomplish this.

Special Operation/Maintenance Conditions for Karst Sensitive Areas

To mitigate the potential for direct connections from on-site stormwater basins to the groundwater, the following recommendations are provided:

- Stormwater swales and retention basins should be monitored by visual observations following significant storm events. If open solutions or pipes and/or sinkhole-like depressions are noted, this information should be relayed to permitting authorities and appropriate corrective action should be taken.

- Where small, shallow depressions are noted, these may be filled to pre-existing grade with clayey sand materials, graded and vegetated.

- When, and if, chimney-type solution pipes are exposed within the retention basins, these may be plugged in accordance with acceptable water well plugging and abandonment procedures. Where

these features are small in diameter and of a limited vertical deptn, bridging of the pipe with indigenous limestone boulders is recommended. Once the bridge is in place, the pipe may be filled with clay and/or clayey sand back to the land surface and then vegetated.

- Remedial plugging activities should employ methodologies acceptable to the applicable regulatory agency.

SW BMP 3.08

ROOFTOP RUNOFF DISPOSAL

Definition

The disposal of rooftop runoff by systems and techniques that avoid or replace direct connections of roof drainage systems to storm or sanitary sewer systems.

Purpose

To reduce the adverse impact of rooftop runoff on receiving waters. When applied on an areawide basis this practice can:

1) Reduce the frequency and magnitude of combined sewer overflows in areas where such systems are used.

2) Reduce peak runoff rates and volume, thus contributing to decreased flooding frequency and lessened stream channel degradation downstream.

3) Reduce the amount of airborne pollutants which reach stormwater conveyance systems via direct connection to building drain spouts.

Conditions Where Practice Applies

Wherever direct connection of roof drainage systems to public sewer, storm sewer or stormwater management systems exists or is planned.

Planning Considerations

The rooftop runoff disposal techniques described are for application to individual structures. In order for these techniques to achieve the purposes stated, they must be applied on an areawide basis. Their use on one or just a few buildings will not have any measurable downstream effect.

In many urban areas, roof drainage systems are connected directly to sewer systems to reduce the inconvenience to property owners of excess surface runoff. Such connections may be permitted, or they may be illicit connections made for the convenience of property owners without consideration of the effects on public sewer systems. Water discharged from these connections takes up flow capacity in the sewers, especially in combined sanitary/stormwater sewers that are often subject to illicit connections.

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Flooding of street and road areas may result with accompanying hazards to health and safety.

Three techniques are described for handling rooftop runoff without direct connections. Depending upon the size of rooftops and local rainfall conditions, these techniques can be used singly or in combination to achieve desired results. The three are:

1) Surface Drainage

The simplest and most widely used technique for disposing of rooftop runoff is to allow it to disperse over the surface of the land. This technique is especially applicable where there is sufficient open space and permeable soils to allow infiltration of surface runoff to occur. This practice is often avoided where property owners fear flooding, excessive surface ponding, or erosion from concentrated runoff. However, if proper precautions are taken, the practice can usually be used without significant problems. Such precautions include:

a) Erosion Protection -- The use of properly designed splash blocks that spread the water at downspout outlet and other points of high velocity flow can reduce erosion potential. Also wherever possible, flow should be made to spread out over wide gently sloping areas instead of being allowed to concentrate. The dispersion can be accomplished by the use of energy dissipators and level spreaders. Surface drainage may cause erosion if the ground slopes quickly away from the downspout. Areas where flow is allowed to concentrate should be stabilized with sod, riprap, or other suitable means as necessary.

b) Flooding Protection -- Adequate drainage should be provided away from the base of the structure as specified in local building codes. As an extra precaution, flow from the rooftop gutters can be carried away from the house in tile drains before it is allowed to outlet to the land surface. Flow should always be directed to areas sloping away from the structure.

c) Minimizing Surface Ponding -- Surface ponding of runoff can best be minimized by using good landscaping techniques. Smooth even slopes will generally drain well. Permeable soils and water-absorbing vegetation or mulch are also key factors in preventing surface ponding.

2) Subsurface Infiltration

Where surface drainage of rooftop runoff is not feasible, the use of subsurface infiltration practices may become a suitable alternative.

Devices such as exfiltration trenches may be installed to dispose of rooftop runoff beneath the land surface. Of course, soils must have a relatively high permeability in order for these systems to function properly. As with surface drainage, adequate precautions should be taken to prevent flooding. Design, construction and maintenance criteria for subsurface retention devices can also be found in this manual (see SW BMP 3.03). Typical applications of subsurface infiltration techniques for rooftop runoff disposal are illustrated in Figure 6-35 and 6-36.

3) Runoff Collection and Storage

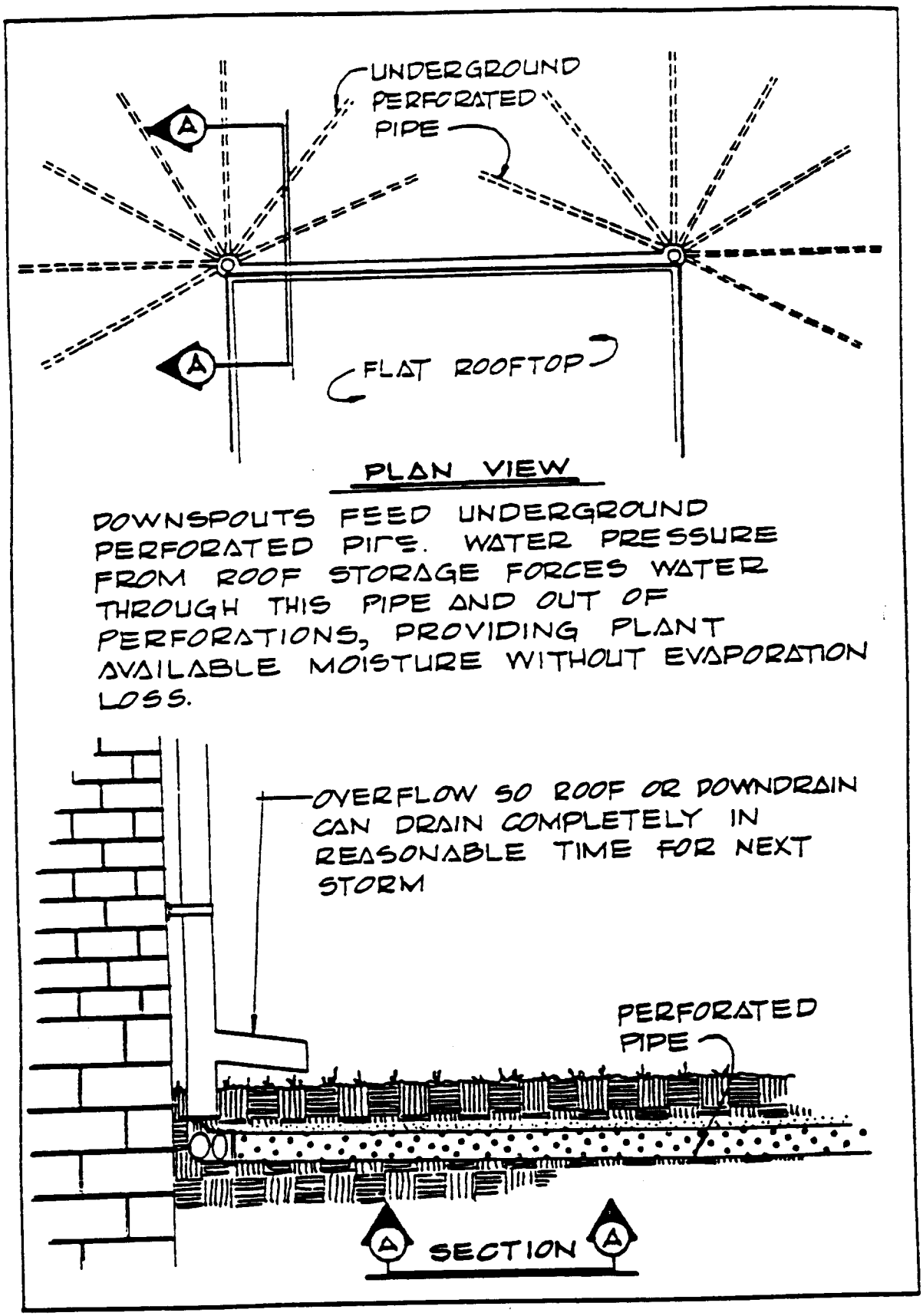
In certain circumstances, neither surface drainage nor subsurface infiltration techniques would be feasible because of poor soils or other site conditions. A suitable alternative may be to collect and store rooftop runoff for later release or use. Rain barrels at downspout outlets are an example of how this technique has been applied in the past. Above-ground storage facilities such as rain barrels, however, are generally not desirable in densely urbanized areas. One solution may be to install cisterns underground to collect the water. The stored water can be utilized for some purpose which does not require treated water, such as garden or lawn watering. A typical application of a cistern for rooftop runoff collection is illustrated in Figure 6-37.

Maintenance

Erosion prevention is important if one is directing the runoff onto the ground surface. Maintenance for infiltration and storage of runoff is covered in the discussion of EXFILTRATION TRENCHES (SW BMP 3.03).

FIGURE 6-35

INFILTRATION DRAINAGE OF ROOFTOP



Source: Virginia Soil and Water Conservation Commission

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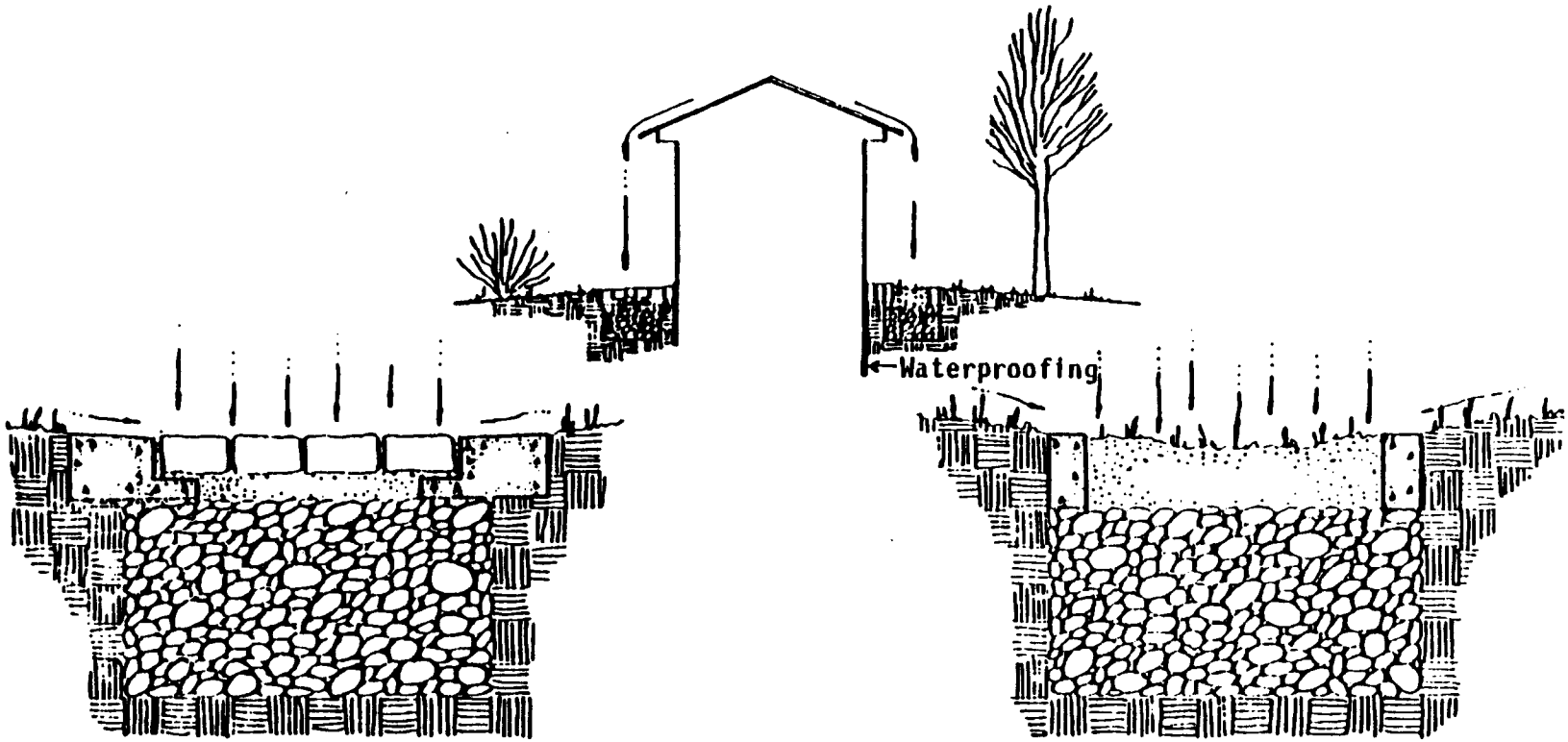

TYPICAL INFILTRATION TRENCH UNDER GUTTERLESS ROOF
FIGURE 6-36

Source: Virginia Soil and Water Conservation Commission

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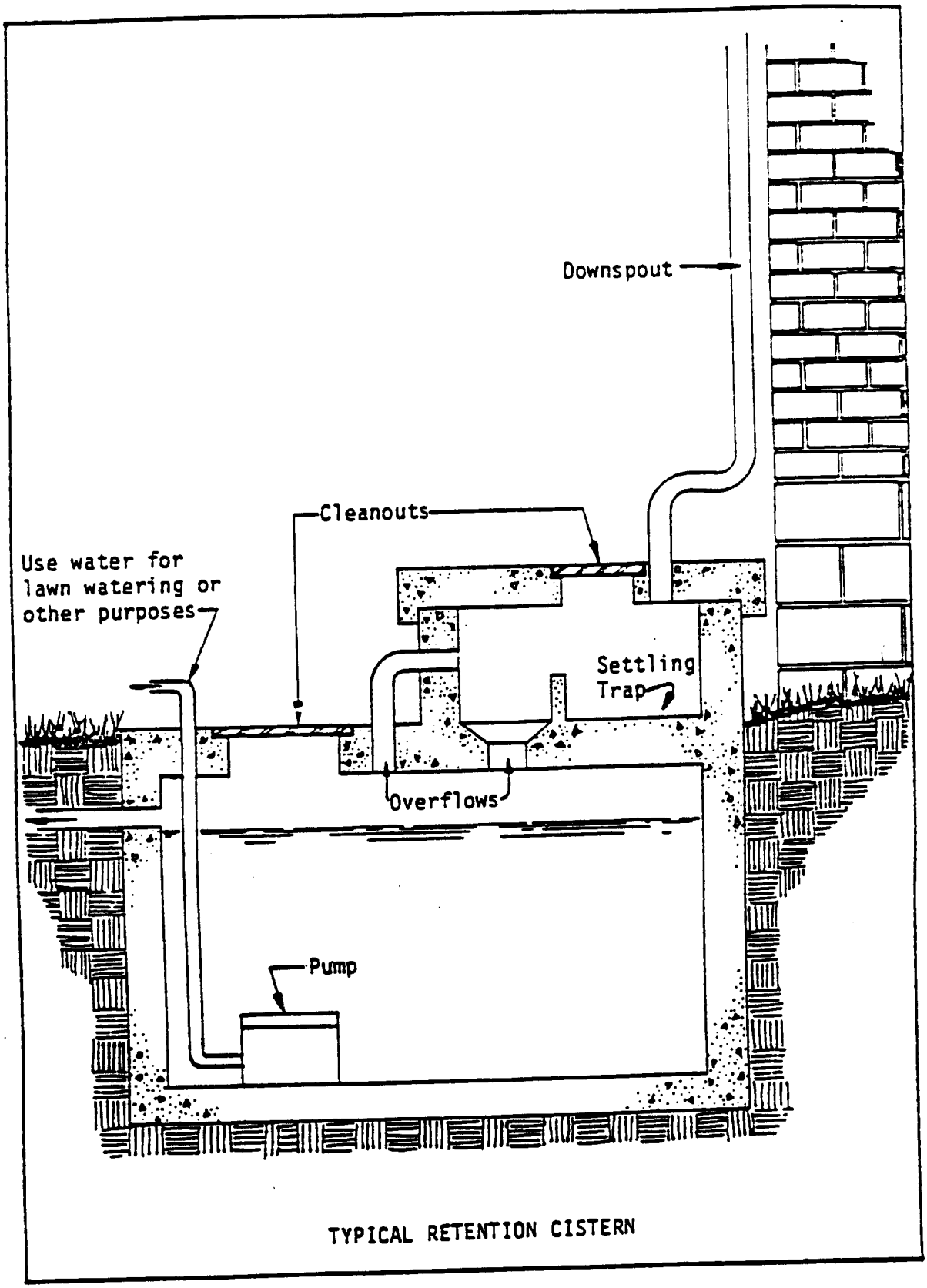
FIGURE 6-37



TYPICAL RETENTION CISTERN

Source: Virginia Soil and Water Conservation Commission

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SW BMP 3.09

STORAGE/TREATMENT

Definition

Unit operations that provide treatment of urban stormwater but are less involved and costly than treatment plant technology and can be either used independently or interfaced with other best management practices.

Purpose

To remove contaminants from collected stormwater.

Conditions Where Practice Applies

Where a level of contaminant removal greater than that achieved by other best management practices is desirable or necessary, but where treatment plant construction or use is not feasible. These techniques are particularly well-adapted for use in conjunction with stormwater detention and some conveyance systems.

Planning Considerations

There are several methods of physical and chemical treatment that have potential for increasing contaminant removal from stormwater. The physical treatment processes are particularly effective for removing flotable and settleable solids and are generally effective for BOD and COD removal. Physical processes are less effective for the removal of nutrients and organics than the more advanced treatment processes. The physical processes described herein are settling (sedimentation tanks) and screening. Swirl regulator/concentrators would also fall into this category. They will not be discussed here. This practice has not been used to any degree for stormwater treatment in Florida. However, designers should be aware that this technique is available and may be adapted for stormwater control.

Chemical treatment processes are seldom used by themselves but are generally used in combination with some physical process, especially to enhance settling. The process of chemical clarification through flocculation and settling is considered a potential best management practice in conjunction with sediment ponds and tanks preceding final polishing of the stormwater effluent, usually via a larger detention, filtration, or retention facility. Chemical clarification can provide increased removal of BOD, suspended solids

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and phosphorous. Chemical flocs can also provide effective removal of heavy metals.

Land application for the treatment of stormwater runoff can also be considered if an appropriate site is available for application of the runoff.

Sedimentation Tanks

Whenever liquid containing solids in suspension is placed in a relatively quiescent state, those solids having a higher specific gravity than the liquid will tend to settle, and those with a lower specific gravity will tend to rise. These principles are used in the design of sedimentation tanks for treatment of stormwater. The objective of treatment by sedi- mentation is to remove readily settleable solids and floating material and thus to reduce the suspended solids content and associated pollutant load.

Sedimentation tanks can be used as stormwater storage tanks, which are designed to provide a moderate detention period (10 to 30 minutes) for overflows from either combined sewers or storm sewers. The purpose is to remove a substantial portion of the organic solids which otherwise would be discharged directly to multiple purpose detention or retention facilities and could form offensive sludge banks. Short-period sedimentation in a tank produces a mixture of grit and organic solids called detritus. Sludge removal equipment may be provided or cleaning by hand may be employed. Such tanks have also been used to provide sufficient detention periods for effective chlorination of such overflows.

The physical construction of a sedimentation facility may vary from an excavation in the ground (often used for presedimentation of extremely turbid waters) to a basin or tank structure of concrete or steel. Such basins are constructed in a variety of sizes and shapes. Depths range from 7 to 15 feet, but 8 to 12-foot depths are most common. Circular tanks run from about 35 to 150 feet in diameter, although some are as large as 200 feet. Square tanks usually have sides less than 100 feet long while rectangular basins are normally 100 feet or more in length. The length-to-width ratio of rectangular tanks varies from about 3:1 to 5:1, the width being controlled in many instances by the size of the sludge-removal apparatus. Bottom slopes are from approximately 1% in rectangular tanks to about 8% for circular or square basins.

To minimize the effects of short-circuiting and turbulent flow, considerable attention has been directed toward effective hydraulic design of inlets and outlets. Inlets are expected to 1) uniformly distribute the influent over the cross-section of the settling zone; 2) initiate parallel or radial flow; 3) minimize large-scale turbulence; and 4) preclude excessive velocities near the sludge zone. Generally, the influent is dispersed across the width or radially from the center of the tank through entrance ports or pipes. Various methods of employing baffles or deflectors to dissipate the velocity

of influent jets have been devised. Considerable large-scale turbulence is often developed by inlet structures; however, by controlling overall tank dimensions, inflow distribution can be confined to a relatively minor volume of the tank.

Part of the volume in a sedimentation tank is ineffective for settling purposes because particles entering this zone become entrained in the effluent. To minimize this effect, a relatively long flow path is desirable. Long, narrow tanks are especially effective under such circumstances.

Outflows are normally controlled by weirs placed along the sides of outlet troughs located beside the walls of rectangular tanks or extending toward the center. In circular basins, weirs are conventionally located on the periphery of the tank. Various types of outlets are of little importance compared with inlet types for control of dispersion characteristics.

The use of flocculating agents may add as many as three ancillary functions to settling units by requiring 1) rapid distribution of the agent through the water to be treated; 2) adequate reaction time or time for floc growth; and 3) return of floc to the influent for the sake of promoting flocculation. These functions are best performed separately in units designed to meet the key purposes. Nevertheless, this is not always done. Large, open basins, constructed by diking off a low-lying area or cut-and-fill methods, for example, may not require refinements in design and separation of functions.

Screening

Screening consists of passing polluted water through devices with openings (generally of uniform size) so that coarse solid material is separated from the water. The screening element may consist of parallel bars, rods or wires, grating, wire mesh, or a perforated plate, and the openings may be of any shape (generally circular or rectangular slots). A screen composed of parallel bars or rods is called a rack. Although a rack is a screening device and its function is referred to as screening, the application of the term "screen" should be limited to elements employing wire mesh or perforated plates. The material removed from screening elements is referred to as screenings, although solids removed from racks are often called rakings. According to the method of cleaning, racks and screens are designated as hand cleaned or mechanically cleaned. According to the size of openings, screens are designated as coarse or fine. Coarse screens have openings of 1/4-inch or more, and fine screens have openings of less than 1/4-inch.

Screening is very effective in removal of coarse and medium grain solids. The efficiency of screens treating stormwater with a normal distribution of sizes will increase as the size of the mesh decreases and as the thickness of the screen mat increases. Screening facilities are not effective in reducing organic or oxygen-demaning material.

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Flocculation

The process of chemical clarification through flocculation and settling can provide a major portion of pollutant removal from urban stormwater runoff. Through the use of lime, iron or aluminium salts, polyelectrolytes, or combinations thereof, flocs or coagulated particles form and settle due to their increased weight relative to the liquid medium within which they are suspended. In the future it may become necessary to use flocculation in sediment ponds and tanks as well as at treatment plants. It is possible to adapt this process to automatic operation. It is feasible to consider recovering the flocculants for reuse.

Because stormwaters vary and fluctuate widely in quality, needed coagulation and flocculation are best determined in practice by trial. Required coagulant dosage is usually found by jar tests performed in a laboratory stirring device. Because coagulation depends on so many variables that are themselves interdependent, as many testing parameters as possible should be kept constant. The importance of pH in governing the nature of the coagulant or flocculent through the extent of hydrolysis and ionization and in determining the charge of colloidal impurities suggests that the pH also be kept constant. In this connection it is well to remember that pH is changed implicitly when a coagulant is added.

Coagulation may be improved by coagulant aids which are substances that increase the critical mass of colloids and speed up coagulation. Kinetically, for example, water with little turbidity may not coagulate as easily and as well as water of moderate turbidity. Coagulation may then be improved by adding turbidity or, more specifically, by adding colloids that carry a charge of the same sign as the natural turbidity of the water. Examples are bentonite, anionic polyelectrolytes, and activated silica. Because the critical mass of colloids interacting with coagulants is increased by additives of this kind, the coagulation process is accelerated. Occasionally, coagulant aids may reduce coagulant dosage by speeding the kinetics of the process. They may also improve the physical character of the flocs. In solutions containing metal ion coagulants, for instance, some anions, polysilicates, and other anionic polyelectrolytes may produce dense flocs that settle fast and respond well to filtration.

Disinfection

Disinfection refers to the selective destruction of pathogenic micro-organisms. Generally, not all of the organisms are destroyed during the process. Viruses, cysts, and bacterial spores are the most hardy. Disinfection may have some marginal application as a best management practice used in conjunction with sedimentation tanks, especially if the process can be adapted to automatic operation.

In applying the disinfectic agents or means, tne following factors must be considered: 1) contact tir 2) concentration and type of chemical agent, 3) intensity and nature of sical agent, 4) temperature, 5) numbers of organisms, 6) type of organisms, 7) nature of the suspending liquid and 8) feeder operation--manual or automatic.

Disinfection through the use of some form of chlorine is 98 to 99% effective in destroying pathogenic organisms with a contact time of only 2 to 4 minutes at 5 mg/l for combined sewage. Some authorities suggest that stormwater may need a dose of 20 to 30 mg/l with 15-minute contact time to make it safe for full-body recreation uses and that perhaps 50 mg/l is required to remove viruses.

Experimental work is being done with other disinfectants. Bromine and iodine can be considered in place of chlorine. Ozone is a highly effective disinfectant, but because it is a relatively unstable gas it must be generated on-site from air or pure oxygen.

SW BMP 3.10

UNDERDRAINS AND STORMWATER FILTRATION SYSTEMS

Definition

Stormwater underdrain and filtration systems usually consists of a conduit, such as a pipe and/or a gravel filled trench, which intercepts, collects, and conveys stormwater following infiltration and percolation through the soil, suitable aggregate, and/or filter fabric. Many of the principles established for "subsurface drains" discussed earlier in the chapter may also apply.

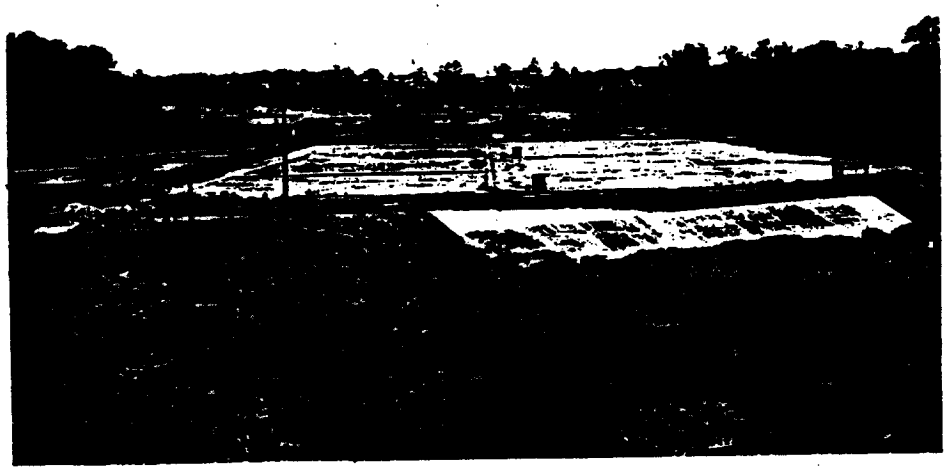
Purpose

In Florida, these systems serve one or more of the following purposes:

1) To filter a portion (normally 0.5 to 1-inch) of the stormwater runoff contained in detention facilities prior to discharge to surface waters or other receiving waters of the state.

2) To alter the soil environment in treatment areas when not suitable for desired vegetation; usually by regulating the period of inundation, the water table elevation, and/or the inflow of shallow groundwater.

3) To improve the infiltration and percolation characteristics of the soil in stormwater management facilities when permeability is restricted due to soil texture or high water table conditions.



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Conditions Where Practice Applies

Underdrain systems and filters are used in combination with a variety of stormwater management measures where space, soil permeability, and/or water table conditions dictate that sufficient pollutant removal cannot normally be achieved through natural percolation, sedimentation, or other means. A gravity outlet must be available or pumping must be provided. A pumped discharge will usually require a permit from the Department and/or Water Management District.

Planning Considerations

Underdrains and filter systems are very similar in design. They differ slightly in their function however.

An underdrain system is intended to improve the percolation rate of the soil and/or control the water table elevation over the entire area of a stormwater treatment facility. Examples include the installation of a tile drainage system in the bottom and along the banks of a detention pond, in the bottom of a grassed waterway, or under a site used for overland flow or landspreading of stormwater. Such a system would be needed when the soil has a good capacity for percolation but has high water table conditions that otherwise prevent the infiltration of the prescribed amount of stormwater through the soil profile of the treatment facility.

A filtration system may also function to lower the water table in its immediate vicinity to some extent; however, the system is not usually designed with this in mind. Filters are normally installed in the bottom or along the banks of detention ponds above the water table elevation. The trench or bed where conduits are installed represent only a small part of the area of the storage facility. The trench is usually backfilled to the surface with aggregate material that is much more permeable than the surrounding soil. Pollutant removal primarily occurs as the prescribed volume of stormwater passes through the sand, gravel, and filter cloth which usually surrounds the conduit.

Filter systems may be used in situations where underdrains are not suitable. For example, filtration is often used in combination with wet detention facilities. Likewise, filtration may be used in situations where the natural soil permeability is restrictive to percolation even when underdrained due to a high percentage of clay or other fine material.

The selection of suitable filter material is critical to the pollutant removal capacity of filter systems. When selecting backfill material the designer should consider its pollution abatement capability not just its hydraulic efficiency. Research has shown that a high percentage of the pollutants associated with urban stormwater may be absorbed on the fine and very fine solids portion of the sediment carried by runoff waters. Generally the more porous and highly permeable the filter fill material, the less efficient the system will be in removing many stormwater contaminants.

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In most cases percolation through the soil profile will provide better pollutant removal rates than filter material. However, in some poorly graded, very sandy soils, or in areas where facilities are excavated into highly porous limestone formations, a filter may be capable of providing more treatment than the natural base material. In these circumstances, detention ponds should be lined with impermeable material and the first one-half to one-inch of runoff filtered before discharge to surface water or percolation to groundwater.

Design Criteria

The design of underdrains and stormwater filtration systems involves several steps. The procedures are illustrated below through the use of several example situations.

PART-I

Conventional Underdrain System Design Using Spacing Equations (Normally Used in Conjunction with Dry Detention Facilities)

Suppose the designer has a project in which the area contributing runoff is a 10-acre office complex. Six acres are impervious and 4 acres are lawn. Based on the initial site survey and published soil survey information, the permeability (e.g., hydraulic conductivity) of the soil is estimated to be 10.0 inches per hour. The site has slow internal drainage due a restrictive layer of finer textured materials which occurs at approximately 80 inches below the surface. The slope of the project averages 0 to 2%. The soils are classified as sandy.

The task of the engineer is to determine the length of underdrain required to drain and filter the water from a detention pond within 72 hours as specified by state regulations. Assume the facility was designed to store the runoff from the first inch of rainfall prior to any direct discharge to surface waters. No additional local water quantity regulations have been adopted. The designer would like the holding area to be no more than 3 feet deep. The steps in sizing an underdrain system to satisfy the provisions discussed above are:

1) Calculate Storage Volume and Area of the Facility

Due to the small size of the project the detention volume (e.g. the amount of runoff to be temporarily stored for filtration through the soil and/or underdrain system) can be most appropriately estimated using a modified form of the Rational Formula.

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Volume of Rainfall Excess (Runoff)= CAR
where: C = Runoff or Rational Coefficient
A = Contributory Area in Acres
R = Rainfall

Converting the volume of runoff to cubic feet we find:
Runoff = C (A acres) (R inches) $\frac{1 \text{ ft}}{12 \text{ in}}$ (43,560 ft^2/Ac) or,

$$\text{Runoff} = CAR\ (3{,}630) ft^3$$

The contributory area (A) is 10 acres and the amount of rainfall (R) with which we are concerned is equal to one inch. However, the runoff coefficient (C) must be established in order to calculate the volume to be treated.

Runoff coefficients have been estimated for various land uses with some typical values shown in Table 6-12. The selection of the appropriate value is at the discretion of the designer and should be based upon experience. Designers generally use average values for pollution control and larger, more conservative values when sizing flood abatement structures.

In this instance the project will be composed of 4 acres of lawns and 6 acres impervious area with flat (0 - 2%) slopes and sandy soil. The procedure used to determine the average value of (C) for this project is illustrated in Table 6-13. The preparation of such a table is useful to the designer to help explain the basis for the coefficient used in runoff calculations. Such foresight may speed up approval from officials responsible for reviewing design plans to determine compliance with various water management regulations.

Substituting C = 0.60 into the equation:
Runoff = CAR (3,630 ft^3) = (0.60) (10) (1) (3,630) ft^3; or, 21,780 ft^3.

Therefore, in order to satisfy the requirements of the example problem the detention area must be capable of detaining and filtering approximately 21,800 ft^3 of runoff prior to discharge.

Since the holding area is being designed for a maximum depth of 3 feet, it will average approximately 7260 ft^2 in area (21,780 ft^3 volume divided by the 3 ft depth of the facility).

2) Determine Drain Spacing

The area over which a subsurface drain can be expected to function must first be estimated in order to determine the length of underdrain needed to lower the water level in the holding area to the desired elevation within a specified time interval. In humid areas such as Florida, both the depth and spacing of drains have been determined largely by experience and judgement

TABLE 6-12

Runoff Coefficients[a,b]

DESCRIPTION OF AREA	RUNOFF COEFFICIENTS	CHARACTER OF SURFACE	RUNOFF COEFFICIENTS
Business		Pavement	
Downtown	0.70 to 0.95	Asphalt or concrete	0.70 to 0.95
Neighborhood	0.50 to 0.70	Brick	0.70 to 0.85
Residential		Roofs	0.70 to 0.95
Single Family	0.30 to 0.50	Lawns, Sandy Soil	
Multiunits, detached	0.40 to 0.60	Flat, 0-2%	0.05 to 0.10
Multiunits, attached	0.60 to 0.75	Average, 2-7%	0.10 to 0.15
Residential, suburban	0.25 to 0.40	Steep, 7% or more	0.15 to 0.20
Apartment	0.50 to 0.70	Lawns, Heavy Soil	
Industrial		Flat, 2%	0.13 to 0.17
Light	0.50 to 0.80	Average, 2-7%	0.18 to 0.22
Heavy	0.60 to 0.90	Steep, 7% or more	0.25 to 0.35
Parks, Cemeteries	0.10 to 0.25		
Railroad Yard	0.20 to 0.35		
Unimproved	0.10 to 0.30		

[a]The coefficients in these two tabulations are only applicable for storms of 5 to 10 year return frequencies and were originally developed when many streets were uncurbed and drainage was conveyed in roadside swales.

For recurrence intervals longer than 10 years, the indicated runoff coefficients should be increased, assuming that nearly all of the rainfall in excess of that expected from the 10 year recurrence interval rainfall will become runoff and should be accommodated by an increased runoff coefficient.

The runoff coefficients indicated for different soil conditions reflect runoff behavior shortly after initial construction. With the passage of time, the runoff behavior of sandy soil areas will tend to approach that of heavy soil areas. If the designer's interest is long term, the reduced response indicated for sandy soil areas should be disregarded.

[b]From Design and Construction of Sanitary and Storm Sewers. ACSE Manual of Practice No. 37, 1970. Revised by D. Earl Jones, Jr.

Wanielista M.P. et.al. "Stormwater Management Manual", 1981

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TABLE 6-13

Example Procedure for Determination of Average Runoff Coefficient (C)

Acreage	Land Use	Values of C (Min) (Max) Table 1	Value of C Selected	Acreage x C Selected
4 Ac	Lawns (Sandy Soil, Flat Slope 0-2%)	0.05 to 0.10	0.075	0.30
6 Ac	Roofs, Asphalt, or Concrete	0.70 to 0.95	0.95	5.70
Total 10 Ac				Total 6.00

Avg. C = $\frac{\text{Total from Column 5}}{\text{Total from Column 1}}$ $\quad C = \frac{6.00}{10} = .60$

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for specific soil conditions. Optimum drain spacing for laterals is influenced by soil permeability, drain depth, optimum depth of water table desired after drainage, cover crops, depth to impervious strata, and the outlet elevation of the system. The minimum cover over the drain should be 2 feet in mineral soils and 2.5 feet in organic soils. The drain trench depth usually varies from 30 to 60 inches. Where practical, increasing the depth of the drain will permit the use of wider spacing and minimize the length of underdrain required for the facility.

In areas where drainage installations and knowledge of effective spacings are limited, the ellipse equation or other similar procedures may be used to determine underdrain spacing. As noted earlier, the procedures used to design the underdrain systems presented in this manual are largely based on techniques commonly used to design agricultural subsurface drainage systems by the Soil Conservation Service (SCS).

The "Ellipse Equation" is expressed as:

$$S = \sqrt{4K\ \frac{(m^2+2am)}{q}}$$

Where:
S = drain spacing (feet)
K = average hydraulic conductivity (in./hr.)
m = vertical distance, after drawdown, of water table above drain at midpoint between lines (feet)
a = depth of barrier below drain (feet)
q = drainage coefficient (in./hr.)
d = depth of drain (feet)
c = depth to water table desired (feet)
(refer to Figure 6-38)

NOTE: The units of K and q may be in "inches removed in 24 hours" or "gallons per square foot per day" but both must be in the same units in this equation. Where there is no barrier stratum present, a barrier should be assumed at a depth equal to twice the drain depth.

Underdrains are designed to remove a certain quantity of groundwater from a given area subject to a high water table due to poor internal drainage. They are used where lateral groundwater flow or movement toward the treatment area is expected to be insignificant. The quantity of water to be removed by the drain is equal to the storage volume which must be percolated within that given area. The objective of the system is to remove a quantity of water that will lower the water table to some predetermined level during the required period of time. The design is based on the spacing and depth required to maintain a certain minimum water level at the midpoint between drains. This is illustrated in Figure 6-38 which shows the configuration of the new water table established after drainage.

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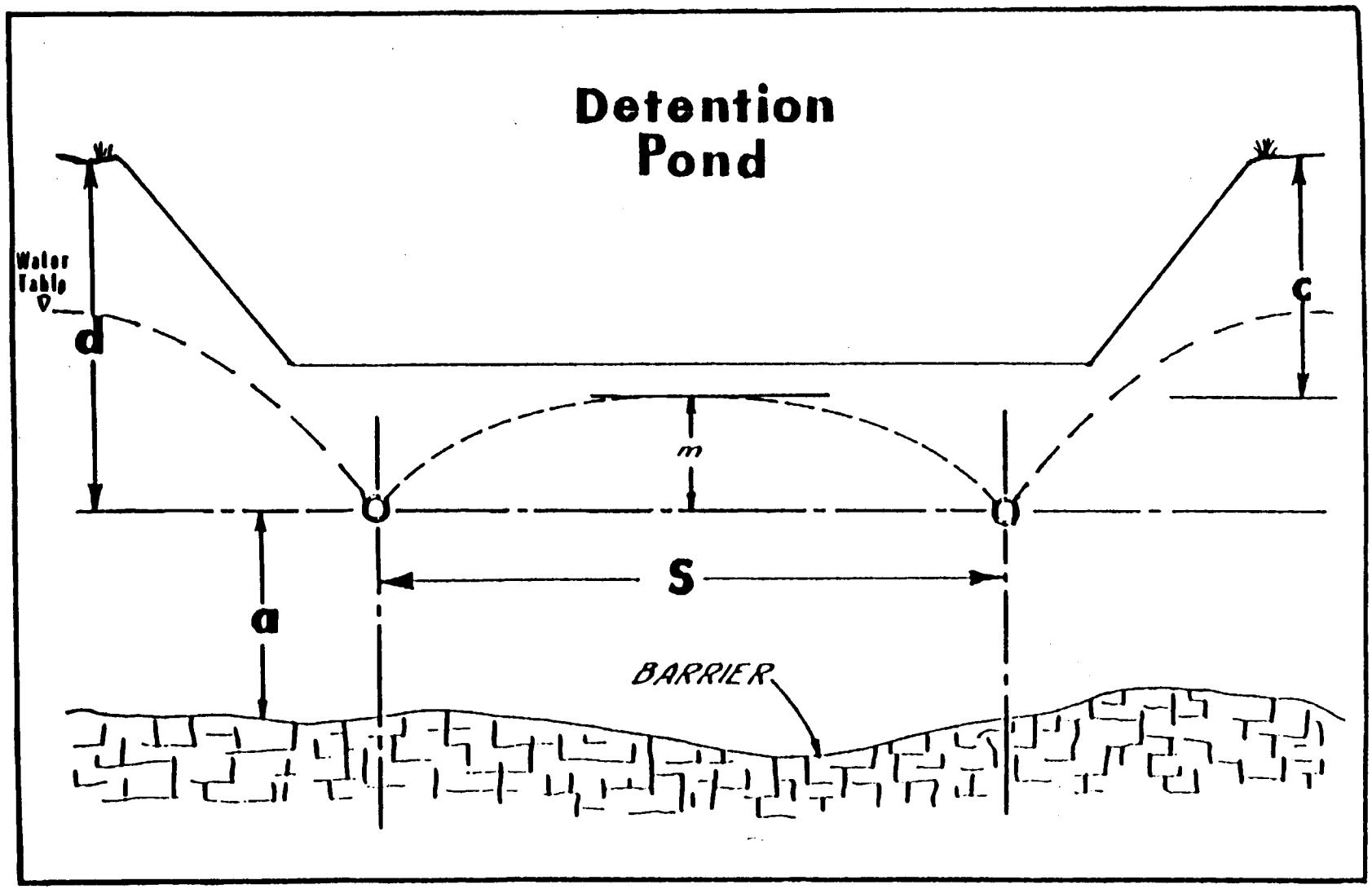
FIGURE 6-38

Cross-Section of Detention Facility with Underdrain System Illustrating Symbols Used in the Ellipse Equation



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The ellipse equation is based on the assumption that groundwater accretion from outside the given area is slight. Although it is known that this assumption is only approximate, it may approach actual conditions very closely under certain site conditions. For this reason use of the formula should be limited to the following conditions:

1) Where the hydraulic gradient of the undisturbed water table is one percent (0.01 feet per foot) or less. Under these conditions there is likely to be very little groundwater flow or movement from outside the facility.

2) Where soil and subsoil materials are underlain by a barrier at relatively shallow depths (twice the depth of the drain or less) which restricts vertical flow and forces the percolating water to flow horizontally toward the drain.

3) Where a gravel envelope or porous sandy backfill materials are used such that there is a minimum of restriction to flow into the drain itself.

The depth of the drain must be determined before the spacing may be computed by formula. As noted above, a minimum depth of 2 feet should be maintained for mineral soils such as those described for this example project. This is especially important for facilities where heavy mowing equipment or other large vehicles are likely to be used for maintenance.

The following illustrates the use of the equation. (NOTE: Variable (a) should not exceed the value of variable (d) to be within the limits of the assumptions associated with the use of the formula). Working through the various factors of the equation:

1) Assuming 6-inch diameter underdrains are to be installed at the minimum depth recommended for mineral soils (2 ft), the depth to the flow line of each drain would equal 5.25 ft. (d), since the desired pond depth is 3 feet and the radius of the pipe is 3 inches or 0.25 ft.

2) As specified earlier the soils information indicates a restrictive layer at a depth of 80" or six and one-half feet. Therefore, $a = (6.5 - d) = 1.25$ ft.

3) The system should be capable of lowering the water level to the pond bottom within 24 hours following storm events if improved grass varieties are to be used as a cover crop or if the storage area is to serve other purposes such as parks and recreation. Assuming the storage area is to be sodded with lawn grass, the depth to water table after drawdown in the vicinity of facility would be equal to the depth of the pond, therefore $c = 3.0$ ft and $m = (d-c) = 2.25$ ft.

4) The average hydraulic conductivity was specified earlier. (K = 10 in/hr).

5) The applicable drainage coefficient is:

$$q = c/t = \frac{3.0 \text{ ft.}}{da} = 1.50 \text{ in/hr.}$$

Substituting the values specified above into the Ellipse Equation:

$$S = \frac{[4(10)(2.25^2 + 2(1.25)(2.25)]}{1.5}$$

$$S = \underline{16.9 \text{ or } 17.0 \text{ ft.}}$$

In actual practice this value may be adjusted slightly to conform with tract dimensions. Suppose the dimension of the facility perpendicular to the direction of the underdrains is limited to 100 feet. Five drains equally spaced (20 ft) would slightly exceed the recommended spacing however, this spacing is within adjustment limits.

Based on the Ellipse Equation, Table 6-14 presents values of (S) or the width in feet over which a subsurface drain would be estimated to be functional given a number of drain depths, soil permeability rates (k) and drainage coefficients (q).

TABLE 6-14

Underdrain Spacing Chart
(based on Ellipse Equation)

q* (in/hr)	k (in/hr)	Drain Burial Depths(ft) 1 2 3
		(S) Spacing (ft)**
0.5	1	4.9 9.8 14.7
	10	15.5 31.0 46.5
0.33	1	6.0 12.1 18.1
	10	19.1 38.1 57.2
0.167	1	8.5 17.0 25.4
	10	26.8 53.6 80.4

*Drainage rates required respectively to drawdown 3-feet, 2-feet, and 1-foot

** $S = \left[\frac{4K\ (m^2 + 2\ am)}{q}\right]^{1/2}$ where:

S = spacing (ft.)
q = drainage rate from column #1 (in/hr.)
k = soil permeability rate from column 2 (in/hr.)
m = drain burial depth (ft.)
a = depth of barrier below drain equal to drain burial depth (ft.) (e.g., a = m)

R0071272

It should be noted that the values of (q) listed in Table 6-14 from top to bottom represent the drainage rates which would be needed to drain 3-feet, 2-feet, and 1-foot of water from the holding area over a 72-hour period. This is the maximum time frame allowed according to specifications adopted by the state. Such limitations are needed primarily for mosquito control purposes, and to ensure a high level of treatment of the average annual rainfall volume based on storm frequency analysis. As can be seen from the table, the deeper the drain, the greater the space over which it can be expected to remove the required amount of water. Likewise the spacing increases as the depth in the holding area is reduced and/or as the permeability of the surrounding base material (soil) increases.

3) Calculate the Length of Underdrain Required

A quick estimate of the length of underdrain can be determined by dividing the value of spacing (S) into the average area of the storage facility. The area was specified in step one of the design procedure ($A = 7260\ ft^2$). There- fore, the length of the underdrain system would equal 7260 square feet divided by the 20.0 foot spacing or 363 ft.

To prevent damage to the cover crop due to erosion and/or seepage, it is usually desirable to keep both the bottom and sides of the detention area dry. Using the top dimensions to determine the configuration of the underdrain can help ensure this function. Suppose the installation in the direction perpendicular to the underdrains is limited to 100 feet and the designer wants the pond to be a maximum of 3-feet deep. Assuming the slope of the sides and shape of the storage area are known, it is possible to determine the top width of the facility and the exact length of drain tile needed.

For example, suppose that the basin is to be rectangular shaped, 3-feet deep, 100 feet along the top, with 3:1 side slopes. A detention area with a top width equal to 88.8 feet, would be capable of storing the required volume of runoff ($21{,}780\ ft^3$). The area served by each lateral in the system would equal the spacing (S) times the length of the drain (L) plus one-half the spacing at each end 2(S/2). In equation form, $A = S(L+S)$. As illustrated in Figure 6-39 the length of each lateral (L) would be equivalent to the top width of the facility (88.8 ft) minus two times one-half the spacing (2)(S/2) or (20.0 ft) which gives **L = 68.8 ft/lateral.** Since five laterals will be needed as specified earlier, the total length of underdrain laterals (L) would equal 344 feet. In mathematical terms

Total Length of Laterals = Lx5 = 344 ft

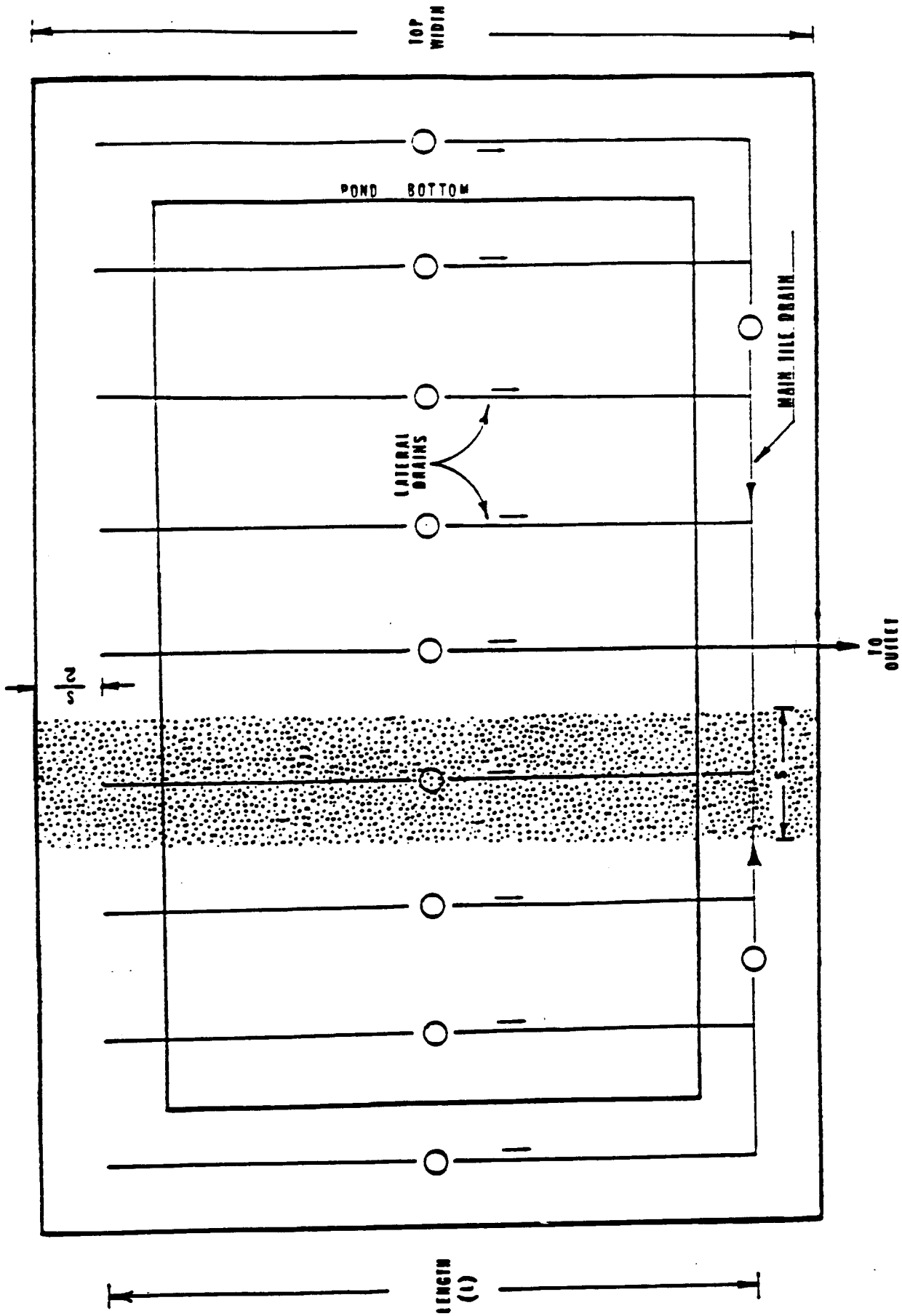

FIGURE 6-39
Sketch of Typical Underdrain System
Illustrating the Area Served by Laterals

R0071274

4) Estimate Design Capacity

The size of the drain may be found by determining the discharge using the following formula.

$$Q_r = \frac{q\ S(L + S)}{43{,}200}$$

Where:
Q_r = Relief drain discharge (c.f.s.)
q = Drainage coefficient (in/hr.)
S = Drain spacing (feet)
L = Drain length (feet)

In this example: (Assuming a 3' deep pond)
Drain spacing = 20.0 feet (S)
Drain length = 344 feet (L)
Drain coefficient = 1.50 in/hr (q)

$$Q_r = \frac{1.50 \times 20.0\ (344 + 20)}{43{,}200} = \boxed{0.25 \text{ cfs.}}$$

5) Determine Drain Diameter, Sizing Underdrains

Subsurface drains ordinarily are not designed to flow under pressure. The hydraulic gradient is considered to be parallel with the grade line of the underdrain. The flow in the drain is considered to be open-channel flow. The size conduit required for a given capacity is dependent on the hydraulic gradient and the roughness coefficient--"n" value--of the drain. Commonly used materials have "n" values ranging from about 0.011 for good quality smooth plastic pipe to about 0.025 for corrugated metal. When determining the size of drain required for a particular situation the "n" value of the product to be used must be known. This information will normally be available from the manufacturer. The diameter pipe required for a given capacity, hydraulic gradient, and four different "n" values may be determined from Figures 6-40, 41, 42 and 43.

Example: **Assume an underdrain on a 0.2% grade (s = 0.002) is to discharge 0.25 cubic feet per second. What size drain will be required if the material to be used has a roughness coefficient of 0.015?** Find the hydraulic gradient 0.002 on the horizontal scale in Figure 6-40 then follow vertically upward to intersect the line representing the design discharge of 0.25 cubic feet per second. This point falls in the space between the lines marked 6 to 8 inches in diameter therefore, an 8-inch drain is required. Since the point of intersection is below the line marked 8 inches, the drain will not flow full. The full capacity of the drain is 0.47 cfs therefore, the drain will flow about 50% full for the design discharge. The same procedure is followed when using Figures 6-40, 41 and 43 for roughness coefficients of 0.011, 0.013, and 0.025, respectively.

R0071275

FIGURE 6-40

Subsurface Drain Capacity Chart - "n" = 0.011
(Source USDA-SCS)

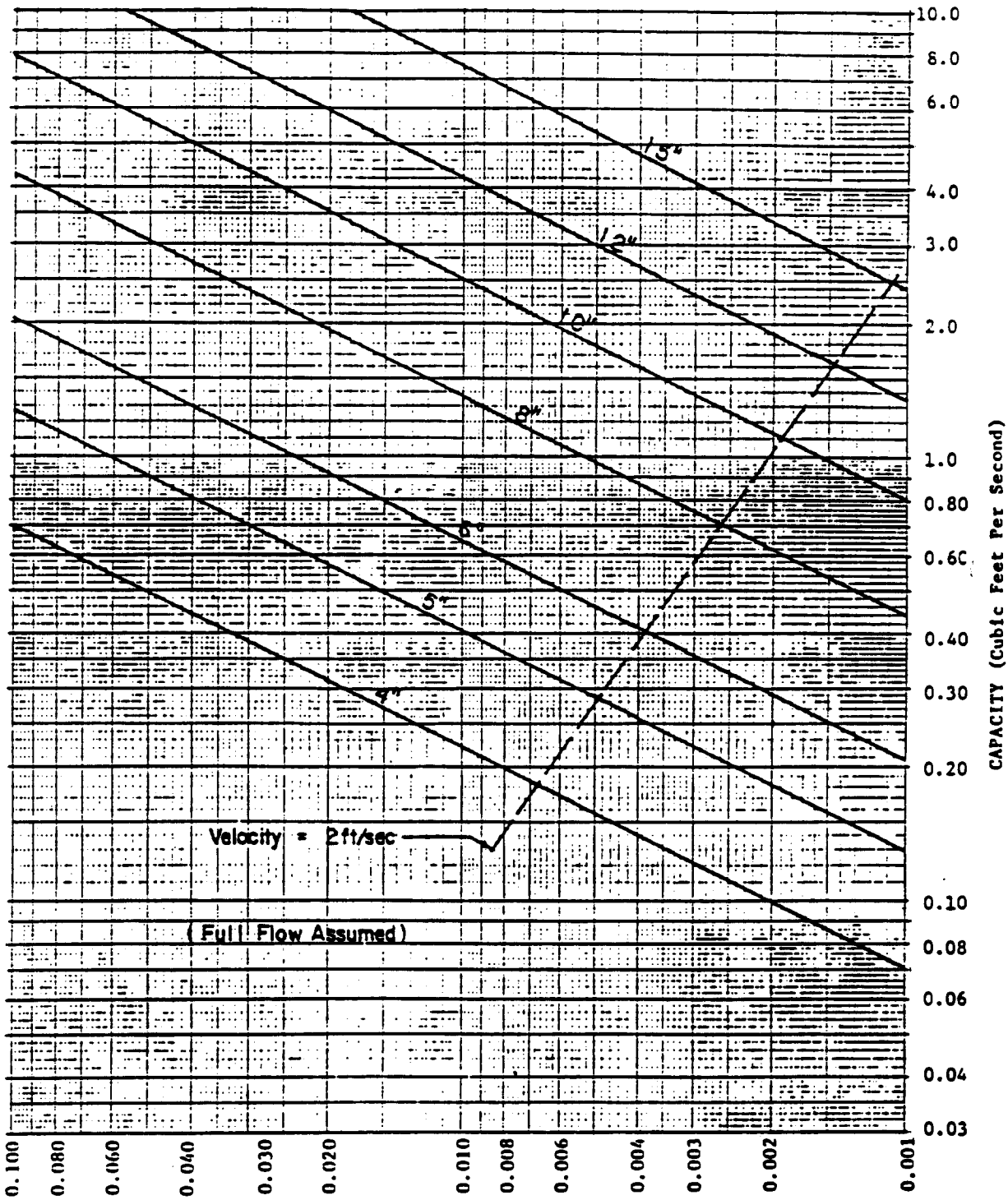

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FIGURE 6-41

Subsurface Drain Capacity Chart - "n" = 0.013
(Source USDA-SCS)

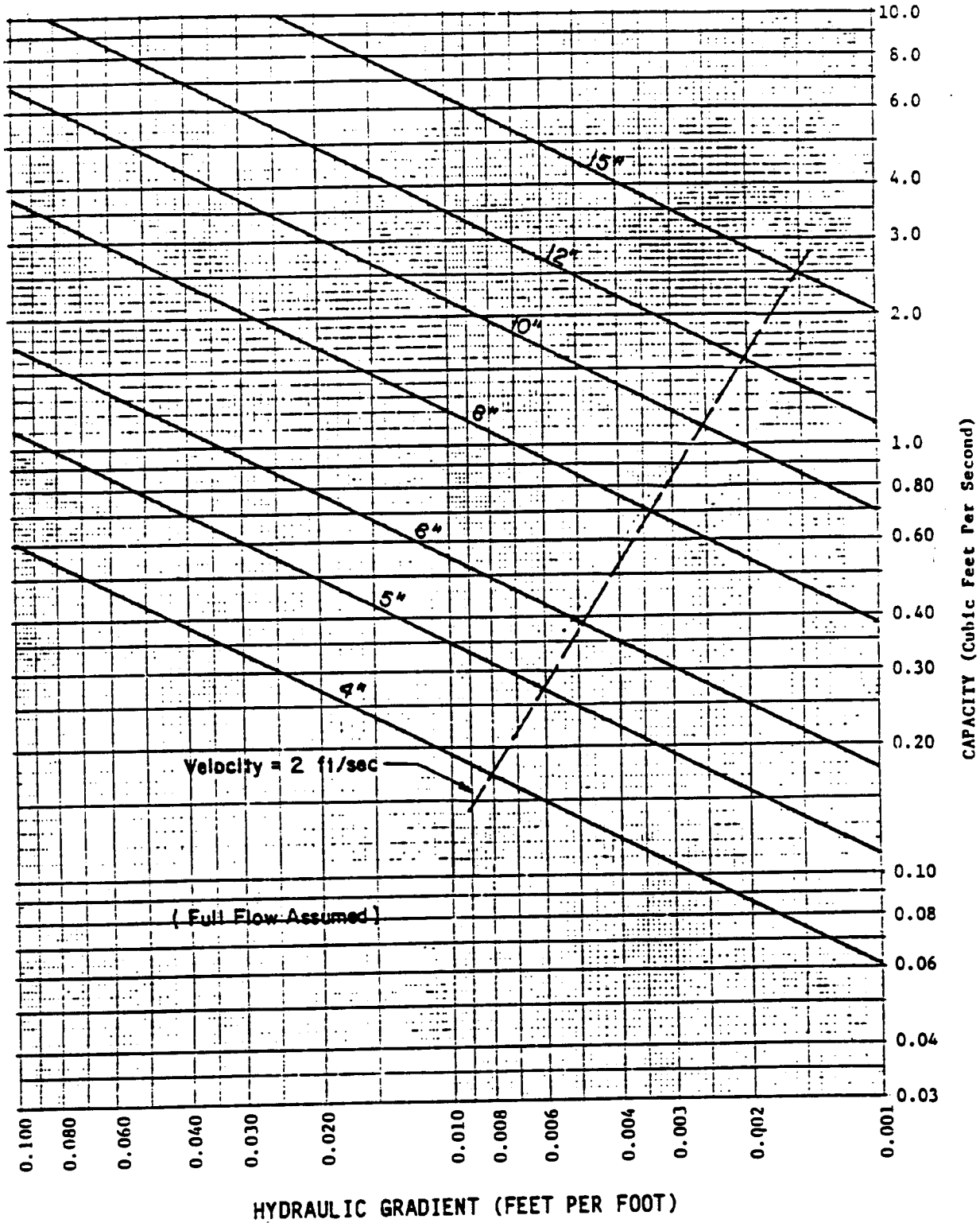

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FIGURE 6-42

Subsurface Drain Capacity Chart - "n" = 0.015
(Source USDA-SCS)

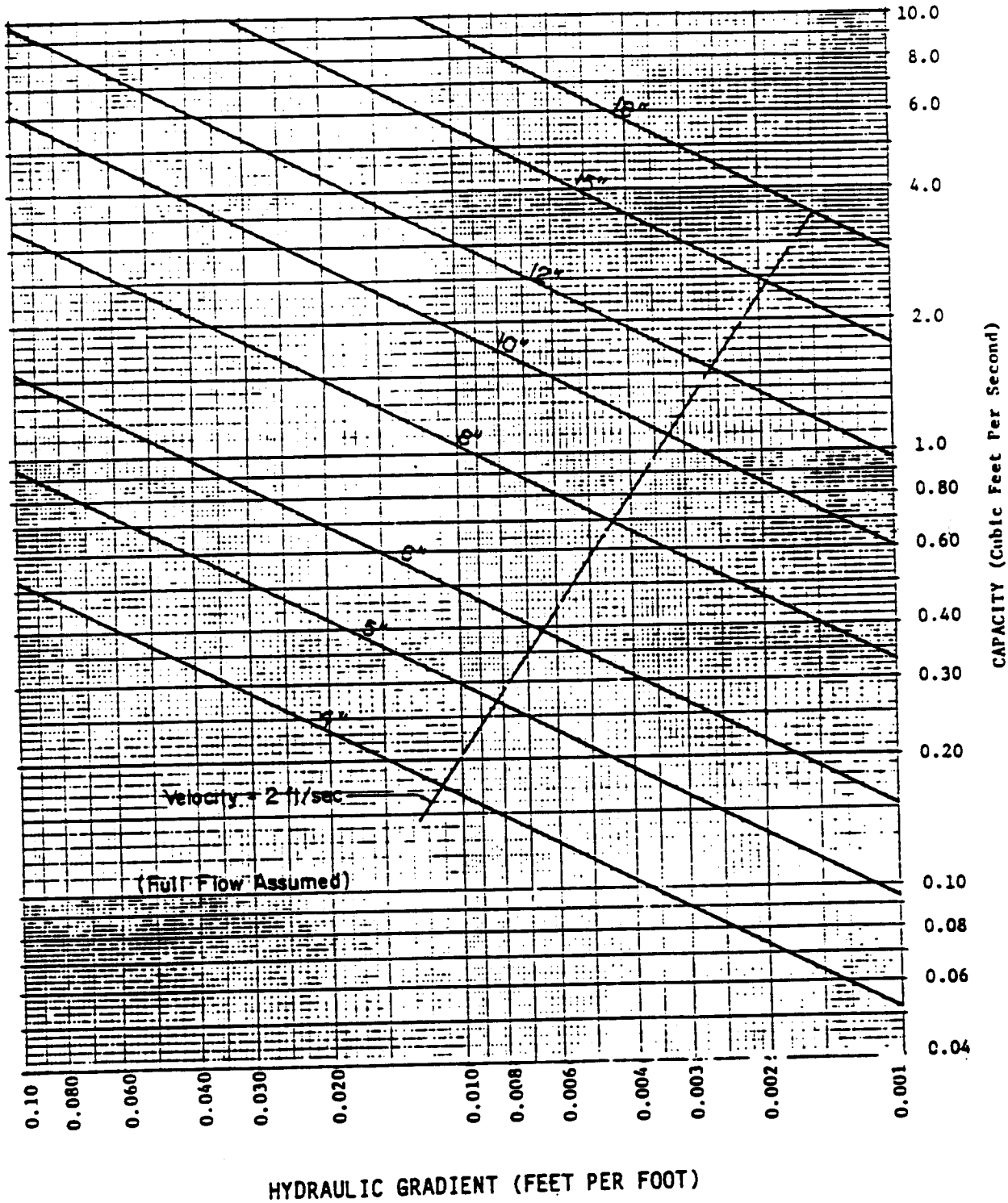

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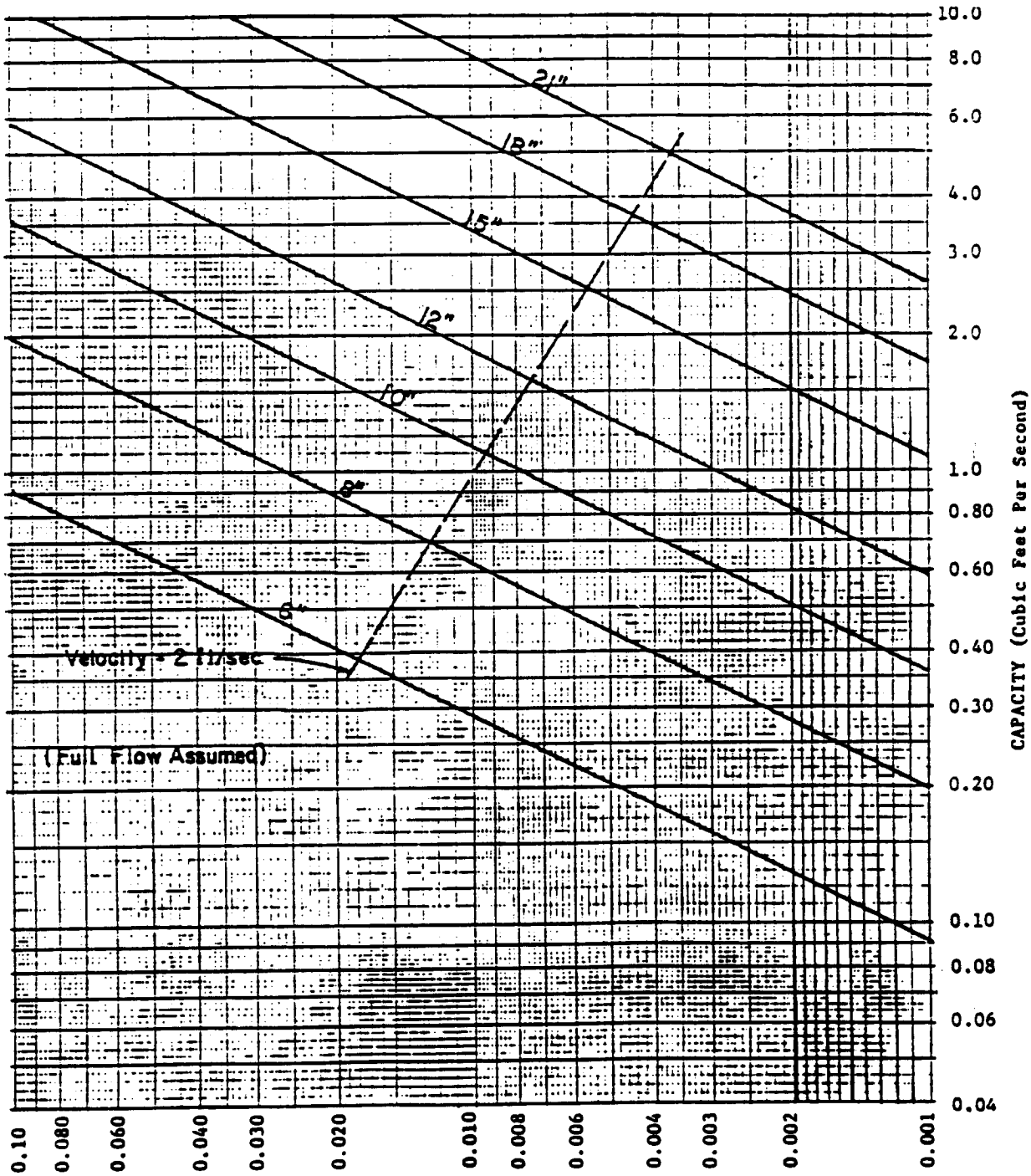
FIGURE 6-43

Subsurface Drain Capacity Chart - "n" = 0.025
(Source USDA-SCS)



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Most filtration and underdrain systems currently being installed throughout the state use a minimum of 6" pipe. Smaller diameters may be used, however, it is presently recommended that the pipes be no smaller than 4-inch material. The area to the right of the broken line in the charts indicates conditions where the velocity of flow is expected to be less than 2.0 feet per second. For a field scale, agricultural subsurface drainage system lower velocities may present a problem with siltation in areas of fine soils. Underdrain and filter beds for urban stormwater treatment should be designed to remove much of the fine solids portion of the particulates being carried in the runoff. Due to the sandy nature of the soils over much of Florida, maintaining velocities greater than 2.0 ft/sec is usually not critical. However, a filter or underdrain system must be designed with this in mind in order to be effective. A layer or combination of layers of pervious materials must be used and installed in a manner to provide for water movement yet prevent the migration of soil particles due to flowing water. In most cases, it is felt that systems designed to the specification contained in the Stormwater Rule should be capable of meeting this goal.

6) Sizing of drains within the drainage system

The previous discussion on drain size deals with the problem of selecting the proper size for a drain at a specific point in the stormwater system (the outlet). In drainage systems with laterals and mains, the variation of flow within a single line may be great enough to warrant changing size in the line. This is often the case in long drains or systems with numerous laterals. The following example illustrates a method for such a design.

Example:

Assume that the total discharge from 344 feet of smooth perforated plastic underdrain is to be .25 cfs, that no surface water is admitted, and that the accretion to the drain is uniform throughout its length. Also assume a constant grade of 0.20%. The accretion per 100 feet of drain would be $\frac{0.25}{3.4}$ = .07 cfs. The "n" value of the pipe to be used is listed as 0.011. Use Figure 6-40 to determine the sizes of tile required. Start the design process at the upper end of the drain using a minimum size of 4 inches. First compute the distance that the drain would carry the flow on the assumed grade. Let (L) equal the distance (in 100-foot sections) down gradient that a 4-inch drain would be adequate. Referring to Figure 6-40, a 4-inch tile with a slope of 0.20% or .002 feet per foot has a maximum capacity of 0.10 cfs and:

$$L = \frac{0.10}{.07} = 1.4 \text{ (100-foot sections)}$$

The 4-inch drain is adequate for 140 feet of line. Continue these calculations for the next size pipe (5-inch) which has a maximum capacity of 0.18 cfs.

$$L = \frac{0.180}{0.070} = 2.60 \text{ (100-foot sections)}$$

R0071280

The 5-inch drain would be adequate for 260 feet. Of this 260 feet, 140 feet would be 4-inch drain; and the remaining 120 feet would be 5-inch drain. These computations should be continued progressively for the total length of the system. The following tabulation shows the complete problem:

Tile Size	Maximum Capacity .20% Grade	Accretion per 100' Line	L-Value Number of 100 Foot	Length of Tile Required
inches	c.f.s.	c.f.s.	stations	feet
4	0.10	0.07	1.4	140
5	0.18	0.07	2.6	120
6	0.29	0.07	4.1	$\frac{84}{344}$[1]

[1]Total length of the drain desired is 344 feet. Although the 6-inch tile would be adequate for 150 feet, only 84 feet are needed.

The example assumes a single line with uniform accretion throughout its length. If investigations indicate a variation in permeability, the accretion rate per 100 foot station may be varied. The same procedure is applicable for mains in a system where laterals join at regular intervals. In this case the accretion to the main would be the accumulative discharges of each of the laterals at intervals equal to the drain spacing.

Example:

Assume that the configuration of the underdrain system being considered is similar to the design illustrated in Figure 6-39 but it has only five lateral drains. One drain line connects into the main drain at the middle, opposite the outlet, followed by two laterals of equal size spaced 20 feet apart on each side. In other words, the total length of the main tile drain runs 40 feet in each direction from its midpoint at the outlet. Further assume that the total discharge expected from the system is 0.25 c.f.s. and that all the other presumptions made in the preceding example also pertain.

Begin by estimating the accretion per lateral. Since each line is of equal length this may be accomplished simply by dividing the total discharge by the total number of lines which feed into the main tile drain. In this case, 0.25 c.f.s./5 laterals = 0.050 c.f.s. per lateral. From Figure 6-40, 4-inch drain tile with a grade of .002 feet per foot has a discharge capacity of 0.10 c.f.s. Therefore, 4-inch pipe is adequate to handle the accretion expected per lateral. Each line would function at 50% of total capacity (e.g., .050 c.f.s. compared to the 0.10 c.f.s. maximum discharge ability).

R0071281

Given the "T" snaped configuration of the outlet pipe and main tile drains as shown in Figure 6-39 the accretion in each 20-foot section of main tile drain would be .050 c.f.s. at the first lateral plus .050 c.f.s. for each additional lateral or 20.0 foot station. Use Figure 6-40 to determine the sizes of pipe required for the main tile drain. Start computation at the upper end of each main with a minimum size equivalent to the diameter of the laterals. In this instance begin with 4-inch pipe. Compute the distance down drain that it would carry the flow on the assumed grade. Let (L) equal the distance that a 4-inch tile would be adequate. This number must be reduced by the number of laterals which enter at the upper end or head of each main (in this case, one). As noted earlier, a 4-inch drain on a grade of 0.20% has a maximum capacity of 0.10 c.f.s. and:

$$L = \frac{0.10}{.05} - 1 = 1.00 \text{ (20 ft. sections)}$$

The 4-inch pipe size is adequate for the first 20 feet on each side of the main tile drain. Continue these calculations for the next size tile (5-inch). From Figure 6-40 the 5-inch plastic pipe has the capacity to carry 0.18 c.f.s. assuming a constant grade of 0.20%. Therefore;

$$L = \frac{0.18}{0.05} - 1 = 2.6 \text{ (20 ft. sections)}$$

The 5-inch drain would be adequate for 52 feet (2.6 x 20 ft. per section). Of this 52 feet, the first 20 feet would be 4-inch pipe. Given the configuration of this system the remaining 20 feet must be increased to 5-inch drain. These computations should be continued for the total length of main drain. However, in this example each main tile line is designed to be 40 feet long in each direction. The following tabulation illustrates the complete problem.

Tile Size	Maximum Capacity .20% Grade	Accretion per 20' Line	L-Value Number of 20 Feet	Length of Tile Required
inches	c.f.s.	c.f.s.	stations	feet
4	0.10	0.050	1.0	20
5	0.18	0.050	2.6	$\frac{20}{40}$

Continue calculations to determine the size of the outlet pipe required. Once again refer to Figure 6-40 to determine the size of smooth plastic drain pipe required. Procedures for selecting the proper size for a drain

at a specific point in a system were discussed earlier. In this example the designer must estimate the discharge capacity for plastic pipe (n value = 0.011).

Find the hydraulic grade 0.002 ft/ft. or .2% on the horizontal scale in Figure 6-40 and follow vertically upward to intersect the line representing the total design discharge from the five laterals (e.g., 0.25 c.f.s.). This point falls in the space between the lines marked 5 to 6 inches in diameter. Therefore, a 6-inch diameter pipe is required. The pipe will not flow full since the capacity of the drain is 0.29 c.f.s.

The final design for the underdrain system would consist of five laterals each 4 inches in diameter spaced equally at 20 feet apart. Each of the main tile drains would be 40 feet long. The first 20 feet would be 4-inch diameter pipe and the final 20 feet to the outlet must be five-inch diameter drain. The outlet must be sized to handle 0.25 c.f.s. therefore six-inch diameter pipe is required.

PART-II

Design Criteria for Stormwater Filtration Facilities

Filter systems for stormwater quality renovation may be used in conjunction with either wet or dry detention facilities. The bottom elevation of the former is below the grade line of the underdrain pipe. Conversely, subsurface drains are normally located in the lowest portion and below the bottom of dry detention facilities.

Examples of stormwater filtration systems include:

1) Filter systems in the banks of wet detention facilities. A typical cross section is illustrated in Figure 6-44. A slightly modified version of this particular style of discharge control structure is shown in Figure 6-45. The major difference between the two consists of a "flash board" type riser for adjustable depths of detention and flood control. Also notice that underdrains enter at the base of the riser pipe in the system shown in Figure 6-45 as opposed to entering somewhere along the outlet pipe as shown in Figure 6-44.

2) Bank filter systems used in conjunction with online or offline wet detention facilities which use the natural in place soils for filtration in conjunction with underdrain pipe for drainage. (See Figure 6-46).

3) Raised filtration beds projecting outward toward the center or extending along the sides of wet or dry detention facilities. (See Figures 6-47, 48, 49 and 50).

FIGURE 6-44

Cross-Section of Stormwater Discharge Structure with
"Mixed Media" Bank Filter System (Wet Detention Facility)

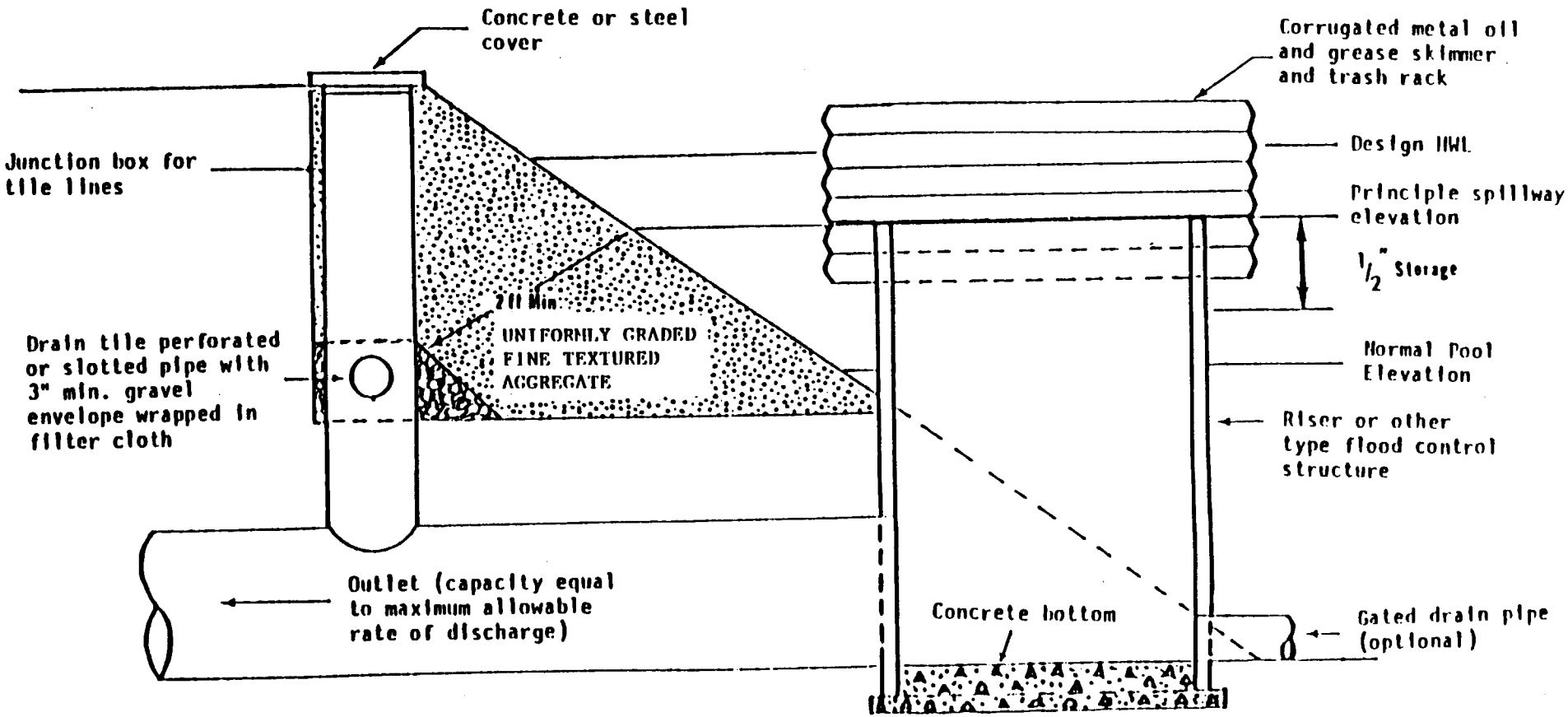

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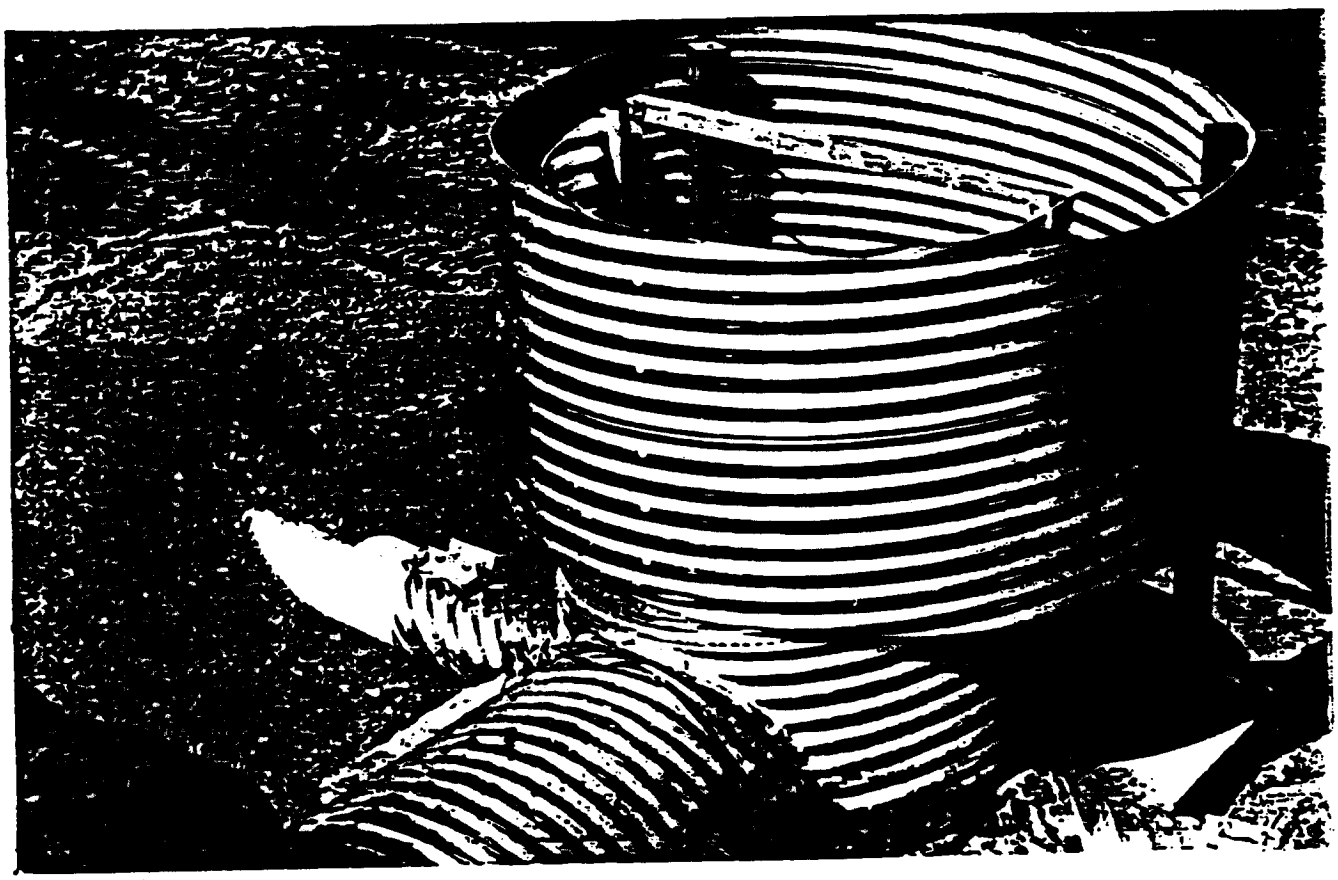
FIGURE 6-45

Typical Stormwater Control Structure @ Orlando Jetport with Bank Filter or Underdrain Pipe to Treat Runoff and Flash Board Riser for Adjustable Levels of Retention and Flood Control



This unit is a custom prefab. The structure consists of a 30-inch outlet pipe, 48-inch riser, and 12-inch underdrain headers; all aluminum construction. (It is suitable for both wet or dry detention facilities).

(Courtesy of Mr. Charles King, P.E., Greiner Engineering Sciences, Tampa, Florida).

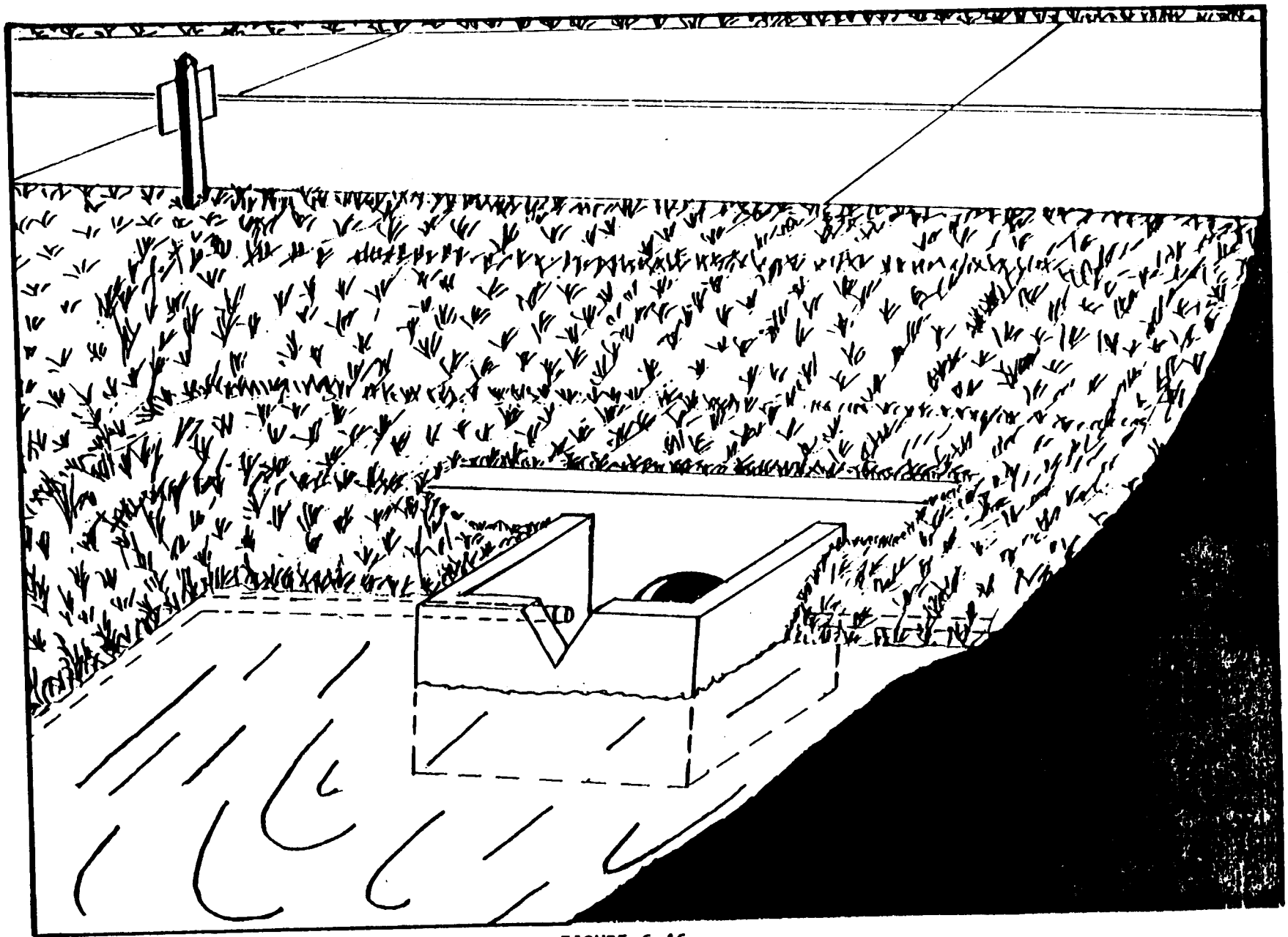


FIGURE 6-46

Illustration of Typical "Natural Soil" Bank Filtration System with
Box Inlet Drop Spillway and "V" Notched Weir. (Wet Detention Facility)

R0071286

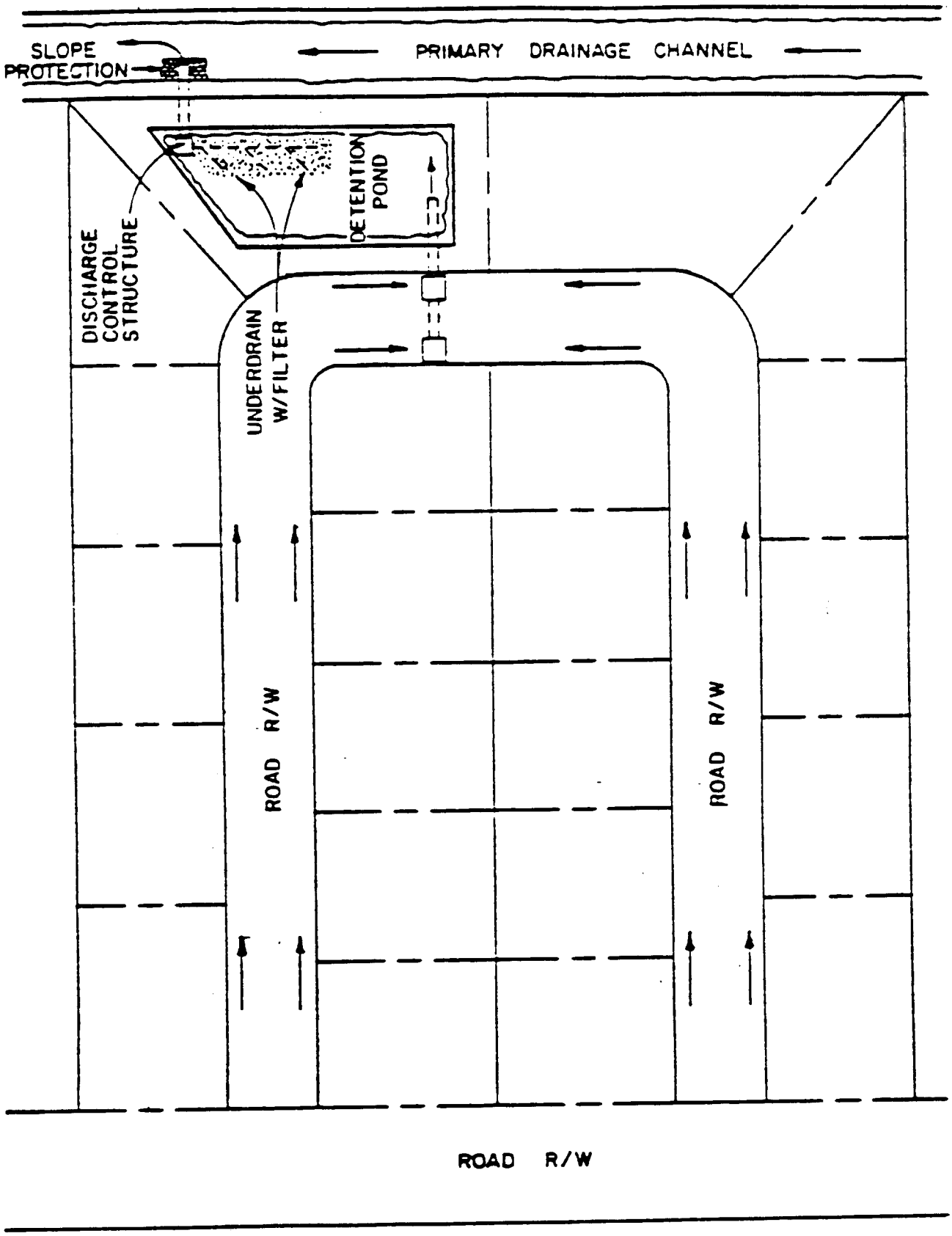


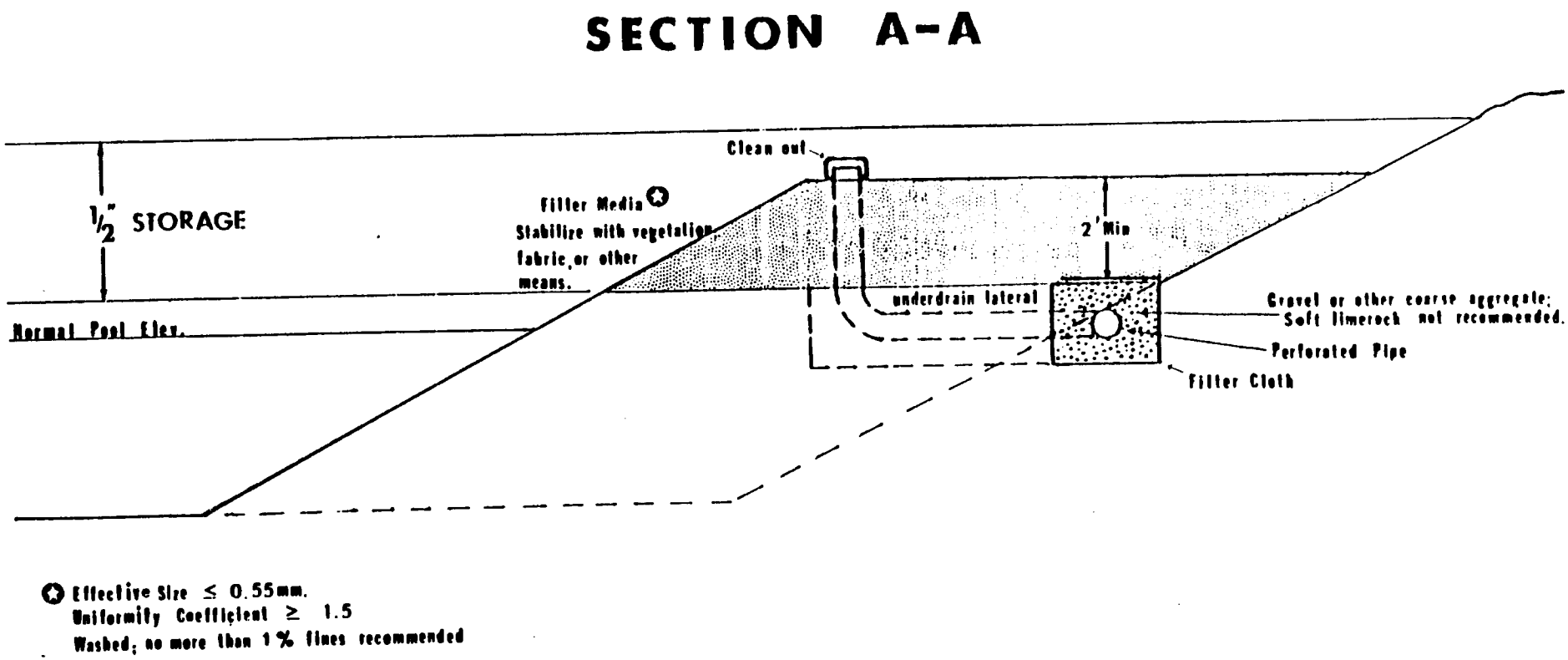
FIGURE 6-47

TYPICAL SUBDIVISION LAYOUT SHOWING ON-LINE DETENTION POND AND OUTFALL
(Courtesy of Pinellas Park Water Management District)

R0071287

FIGURE 6-48

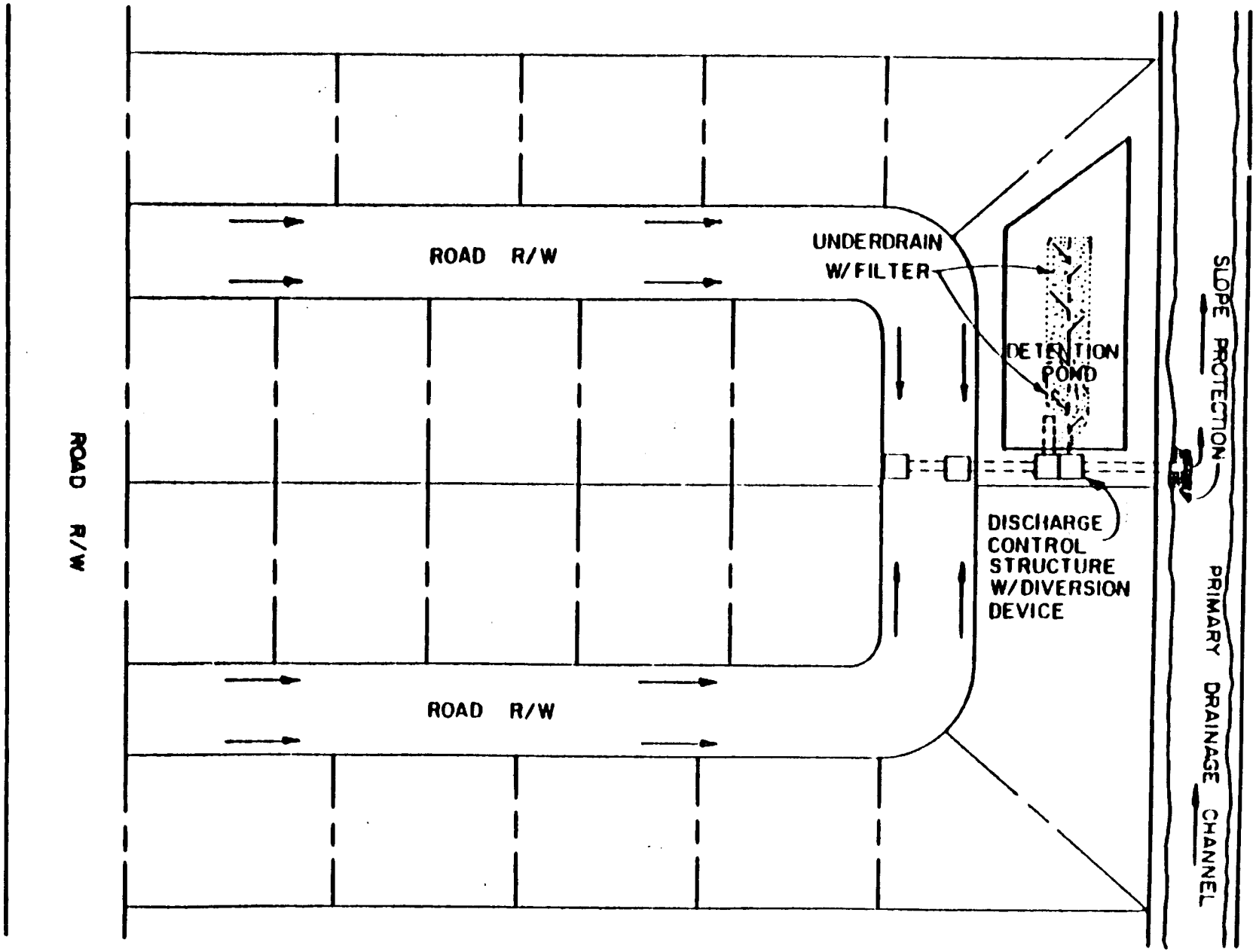
Typical Cross-Section of Elevated Bank Filtration Bed Used in Conjunction with Wet Stormwater Detention Facilities



R0071288

FIGURE 6-49

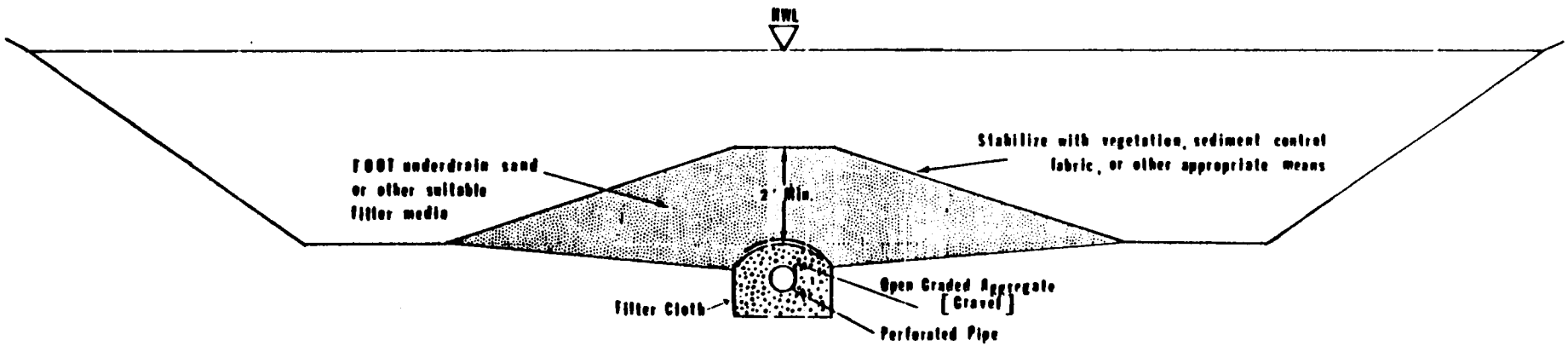
TYPICAL SUBDIVISION LAYOUT SHOWING OFFLINE DETENTION POND AND OUTFALL
(Courtesy of Pinellas Park Water Management District)



R0071289

FIGURE 6-50

Typical Cross-Section of Elevated Sand Filter for Stormwater Treatment Used in Conjunction with Dry Detention Facility



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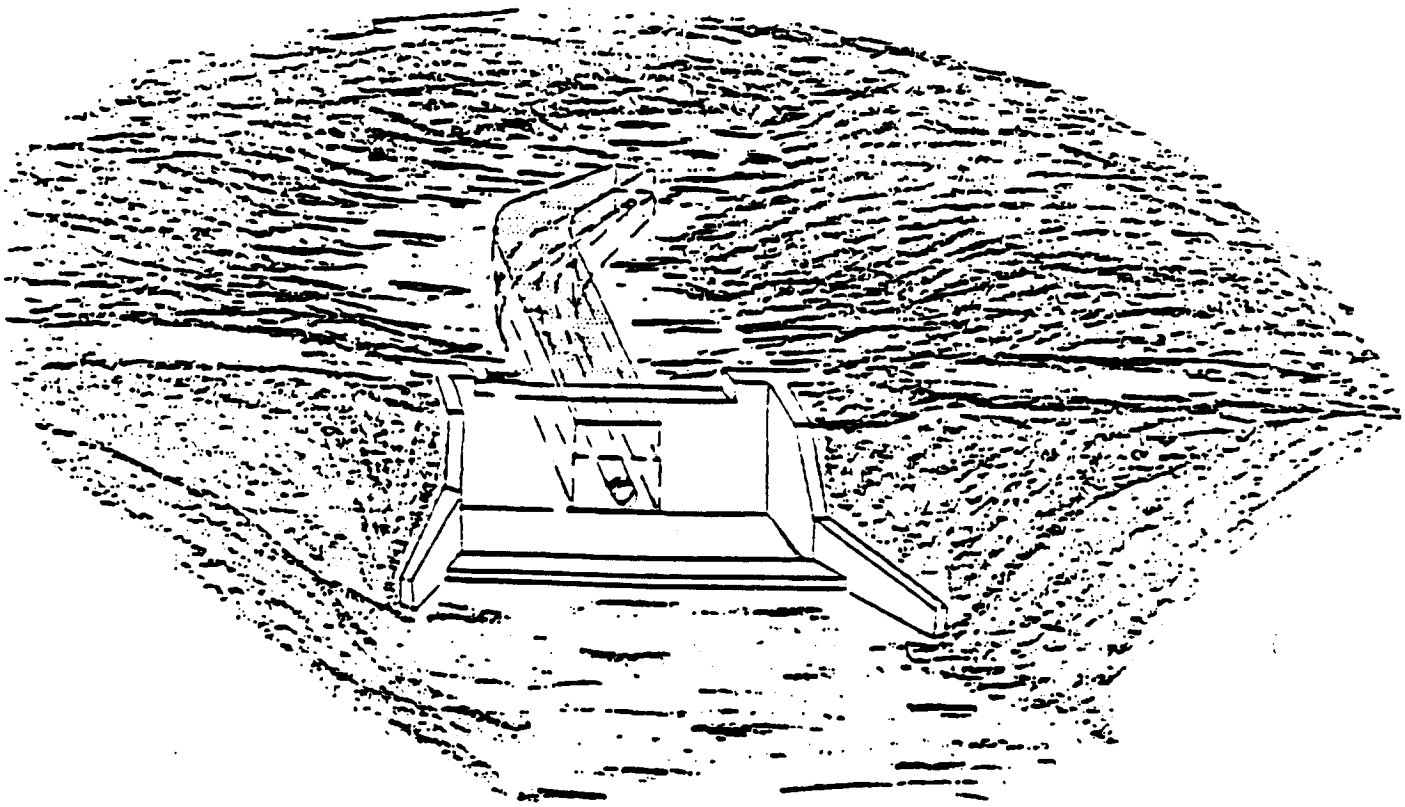


FIGURE 6-51

Illustration of Bottom Filter or Underdrain System in Conjunction with Rectangular Weir and Drop Spillway (Normally Used with Dry Detention Facilities and Swales on Tight Soils and/or Steep Slopes)

R0071291

4) Sand filter systems installed in the bottom of swales to improve percolation. (See Figure 6-51).

How does the Stormwater Rule standards listed in Chapter 17-25, F.A.C., affect these systems?

Underdrain systems and bank filters which use natural soil for filtration do not have to meet the requirements in section 17-25.025(2), F.A.C. pertaining to effective grain size, uniformity coefficient, etc.

However, these systems must be designed to prevent piping both within and through the filter. They are also subject to the 2 feet minimum flow requirements specified in Section 17-25.02(8), F.A.C.

Filter systems which use an aggregate other than natural soil for filtration must satisfy the standards listed in Section 17-25.025(2), F.A.C. The current standards for filter media are summarized and noted at the bottom of Figure 6-48.

Material with effective sizes less than .20 millimeters are acceptable to the Department for pollution control purposes. However, applicants may find the permeability to be restrictive.

Likewise, material mixed with organic matter or colloidal material may improve pollutant removal. However, anything more than slight amounts of material less than 0.074 millimeters in size has the potential to reduce hydraulic capacity quite substantially. The improvement in removal efficiency of such practices is still being tested by Dr. Wanielista and others at this time.

Design Procedures for Sizing Stormwater Filtration Systems

Underdrain design procedures will often involve the use of "spacing equations" to determine the area over which the drainage network can be expected to function to drain the proper amount of water in the required time frame.

Filter systems are usually designed by trial and error. In this procedure drainage capacity is checked for compliance with various regulations until a suitable configuration (e.g., trench area, depth, pipe diameter, and hydraulic conductivity of filter media) is achieved to meet drawdown time and grain size requirements. In terms of stormwater treatment, the Department is interested in the various design procedures from the standpoint that underdesign will result in reduced hydraulic capacity. This, in turn, will result in a reduction in storage between subsequent rainfall events and an associated decrease in the annual average volume of stormwater treated resulting in a reduction of pollutant removal. Such circumstances also reduce the aesthetic value of the system and may promote mosquito production.

R0071292

In most cases, various forms of the Darcy Equation for saturated flow through porous media are used to design filters. The equation is written:

$$Q = K\ i\ A$$

Where:

Q = Flow in ft^3/hr
K = Permeability rate of filter media (ft/hr)
i = Hydraulic gradient (ft/ft)
A = Area of the aquifer or water bearing strata intersected (ft^2)

The basic equation is applied in a number of different ways.

1) Calculating the length of a bottom filter and determining drain pipe size.

a) Possibly the most simplistic application of the Darcy Equation involves a slight manipulation in the formula such that the designer may determine the length (L) of a bottom filter, as illustrated in Figure 6-52, to treat and dewater an area sized to hold either the first one-half inch of runoff or the runoff from the first inch of rainfall. The flow (Q) of water reaching the underdrain pipe is assumed equal to its average velocity as it moves through the filter profile multiplied by the cross sectional area of the aquifer or filter trench intersected.

The velocity of flow is assumed proportional to the soil hydraulic conductivity (K) at a hydraulic gradient of unity (i.e. i=1).

The cross-sectional area intersected (A) is usually assumed equal to the average width of the drain field or trench (W) times the length of the drain (L). In mathematical form:

$$A = WL \text{ and therefore, } Q = KiWL.$$

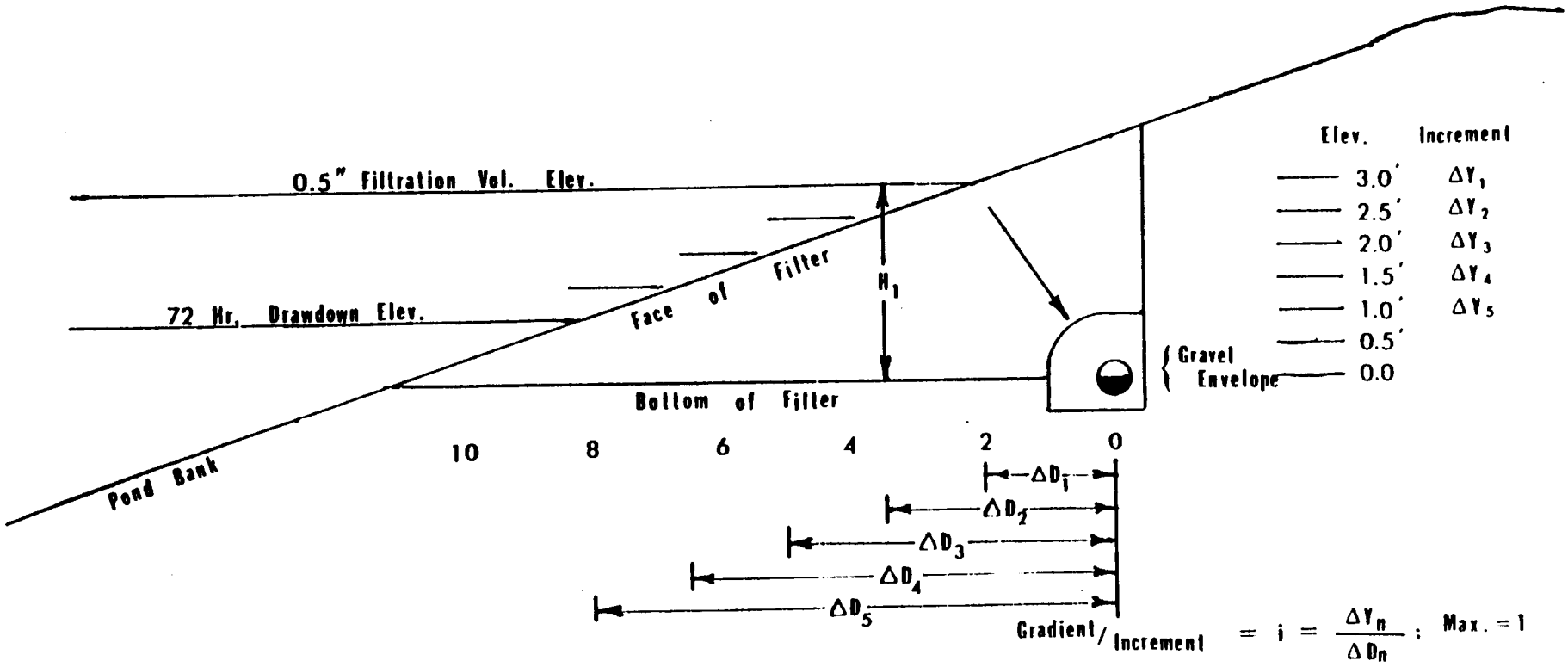
The drain length is unknown but can be determined by rearranging the equation if the width of the trench is known:

$$L = \frac{Q}{KiW}$$

The flow (Q) is based on the storage volume which must be removed in the time frame desired. (K) is determined based on field permeability test or other information. The value of (W) is determined at the discretion of the designer. Its value normally will vary depending on the depth of the drain and the size pipe required.

FIGURE 6-52

Cross-Section of Bank Filter Illustrating Parameters Used in Calculating Drawdown Time with Darcy's Equation for Lateral Flow Situations



Example:

Suppose a facility is required to store one-half inch of runoff water per acre of project area as per state design criteria. Further, suppose the project is twenty acres in size with the hydraulic conductivity or permeability of the filter media (K) equal to ten inches per hour. The design calls for a three feet wide filter trench with the underdrain system installed two and one-half feet below the bottom of the detention facility for drawdown.

The length of filter and underdrain pipe needed to satisfy FDER criteria may be derived using the equation:

$$L = \frac{Q}{KiW}$$

Based on information presented in the paragraph above the one-half inch volume of runoff which must be temporarily stored and treated would equal ten acre-inches or 36,300 cu. ft. To drain the entire amount (36,300 cu. ft.) in three days (72 hrs.) would require an average rate of outflow equal to 504 cu. ft./hour. The length (L) of underdrain needed to satisfy the three day requirement is:

$$L = \frac{Q}{KiW} = \frac{504 \text{ cu. ft./hr.}}{(.833 \text{ ft./hr.})(1)(3 \text{ ft.})}$$

$$L = \underline{202 \text{ ft.}}$$

However, let's suppose the detention area was also planned for use as open space such as a park or recreation facility. In this instance it would be desirable to discharge the stored water within a day. The length (L) needed to provide sufficient drawdown in 24 hours would be:

$$L = \frac{1513 \text{ cu. ft./hr.}}{(.833 \text{ ft./hr.})\ (1)\ (3 \text{ ft.})}$$

$$L = \underline{606 \text{ ft.}}$$

In either instance, the discharge capacity of the underdrain pipe must be equal to or greater than the flow intercepted (Q). Given the latter circumstances, the pipe should be sized to carry at least a flow equal to 1513 cu. ft./hr. Converting this value to 0.42 cfs., the pipe size may be determined in accordance with procedures mentioned earlier (see Part I). Using the SCS Drain Capacity Charts included in this section, 8" corrugated polyethylene pipe (CPEP) with a roughness coefficient (n = 0.015) at a grade of 0.5% or .005 ft./ft. would be capable of conducting the proper amount of water.

The results of this analysis are based on several simplifying assumptions that would rarely, if ever, occur. The hydraulic gradient (i), for example, does

not remain constant. The value will change as the water level in the facility rises and falls. A more detailed assessment procedure capable of ascertaining the difference in drainage capacity under variable head conditions would reduce the amount of drain required.

Likewise, the assessment also presumes there are no other contributions from sources such as groundwater. Artesian type conditions would be expected to occur should high water table elevations surround the treatment area during any portion of the year. The size of the underdrain pipe would need to be increased. An increase of 1.5 to 2 times should be used in these situations.

b) A more complex method to determine if a specific design will satisfy the drawdown requirement under various head conditions is currently used by several engineering companies. The procedure combines Darcy's Law and the Falling Head Equation into a form similar to that used to determine the hydraulic conductivity (K) from falling head permeability testing techniques. The equations may be rearranged to solve for either drawdown time (t) or filter area (A) if the hydraulic conductivity (K) is known, and certain simplifying assumptions are made.

$$K = \frac{2.3\ aL}{A\ dt}\ \text{Log}_{10}\ \frac{h_0}{h_i}$$

$$dt = \frac{2.3\ aL}{AK}\ \text{Log}\ \frac{h_0}{h_i}\ \text{and,}$$

$$A = \frac{2.3\ aL}{Kdt}\ \text{Log}\ \frac{h_0}{h_i}$$

In these equations a is the average cross-sectional area of the pond or reservoir; A is the cross-sectional area of the soil profile or filter served by the drain tube; L is the length or depth of the soil profile (filter media) through which the water must travel to reach the gravel envelope or perforated pipe; in most cases that value will be a minimum or two feet; and dt is the time interval (hrs.) during which the elevation drops from its initial value (h_0) to some lower value (h_i) as the water approaches the pond bottom.

Example: Assume our objective is to estimate the time to remove the 36,300 ft^3 of runoff discussed in the previous problem. The area of the facility is assumed to remain constant as the water receeds. The head (h_0) at the time when the facility was full would equal 5.0 feet. The average area (a) may be calculated by dividing the pond volume by the depth. In this case presume the pond was designed 3 feet deep.

Working through the equation when the facility was full to determine the area (A) of filter needed:

a = 12,100 square ft.
L = 2.0 ft. (average length of travel)
K = 10 in/hr. or .833 ft. hr.
h_o = 5.0 ft.
h_i = 2.0 ft.
dt = 24 hrs.

Therefore:

$$A = \frac{2.3\ a\ L}{Kdt} \quad \text{Log} \quad \frac{h_o}{h_i}$$

$$A = \frac{2.3\ (12{,}100)(2.0)}{.833\ (24)} \quad \text{Log} \quad \frac{5.0}{2.0}$$

$$A = \frac{55{,}660}{20} \times 0.40$$

$$A = \underline{1{,}113\ ft^2}$$

Given no accretion from other sources, a filter three ft. wide by 371 ft. long should be capable of draining the facility. As may be seen, the results using this procedure will be much more favorable to the applicant since the drain length is reduced. This is because the previous assumption relative to a hydraulic gradient of unity (i = 1) is not used in this procedure. The procedure is much less conservative than the former.

The designer should also notice that this analysis is dependent on the presumption that the size and slope of the drain tube as well as the number and size of pipe orifices or openings will not restrict the maximum peak flow delivered to the drain tube via the filter media.

In using the equation above, pipe size must be checked using the pipe flow capacity charts mentioned previously. Likewise, orifice area must be checked using the orifice equation which may be written:

$$Q = C_d A\ (2gh)^{1/2}$$

Where:
Q = Orifice discharge (cfs)
C_d = Coefficient of discharge (usually assumed to be 0.6)
A = Orifice cross-sectional area ($ft.^2$)
g = Gravitational acceleration (32.2 $ft./sec.^2$)
h = Hydraulic head above the orifice (ft.)

The maximum peak flow expected from the filter system must first be calculated once again using Darcy's Law.

$$Q = KiA = K \frac{Y}{D} A$$

Where:

K = Coefficient of soil permeability (ft./hr.)
i = $\frac{Y}{D}$ = Instantaneous hydraulic gradient
A = Area of trench or filter ($ft.^2$)
Y = Head difference between water level elevation behind the structure at any point in time and the flow line of the underdrain pipe or top or gravel envelope if used
D = Depth of soil column or filter to flow line of underdrain or top of envelope material
Q = Instantaneous rate of discharge ($ft.^3$/hr.)

Continuing to work through this example problem:

K = 0.83 ft./hr.
Y = 5.0 ft. (when the detention area is full)
D = 2.0 ft.
A = 1113 $ft.^2$

Therefore:

$$Qmax = K \frac{Y}{D} A = 0.833(2.5)(1113)$$

$$= 2318 \text{ ft.}^3\text{/hr.}$$

$$Qmax = 0.64 \text{ cfs.}$$

Checking this rate of flow with the SCS pipe capacity charts mentioned previously for n = 0.015 and hydraulic grade (0.005 ft./ft.) indicates that an 8-inch pipe will remain adequate to handle the maximum peak flow.

The minimum orifice area required is then determined using the following equation:

$$A = \frac{Q}{C_d\sqrt{2gh}}$$

Where:
A = total orifice area required
Q = .64 cfs
C_d = .6
g = 32.2 $ft./sec.^2$
h = 5.0 ft.

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$$A = \frac{.64}{.6\sqrt{64.4 \times 5}} = .059 \text{ ft.}^2/371 \text{ ft. of pipe}$$

$$= 1.6 \times 10^{-4} \text{ ft.}^2/\text{ft. of pipe}$$

$$A = \underline{.023 \text{ in}^2} \text{ ft. of underdrain pipe}$$

Therefore, a pipe is required that contains at least eight or more 1/16 inch diameter holes per foot.

2) Calculating the length of a bank filter and determining pipe size required.

Either of the two basic procedures discussed above may also be used to determine the length of a bank filter system. However, the designer should notice that both the cross-sectional area of the filter media intersected by the drain and the hydraulic gradient which was presumed to be unity or larger in the previous analysis decrease with time in these systems. These factors must be taken into account and act to complicate the more simplistic procedures discussed previously. The length of bank filters is usually established by trial and error. The designer chooses the underdrain length desired and subsequently checks drawdown time against state regulations or land use requirements until a suitable configuration is reached.

a) Procedure for sizing bank filters based on Darcy's Equation

The most simple and easily understood method for sizing bank filters is primarily applicable to conditions wherein lateral flow is predominant (see Figure 6-52).

Once again, the rate of flow should be in accordance with Darcy's Law which states that the flow velocity of water through porous media media is proportional to the hydraulic conductivity and the hydraulic gradient. The relationship may be stated:

$$V = Ki$$

Where: V = velocity of flow
K = the hydraulic conductivity
i = the hydraulic gradient $\frac{\Delta Y}{\Delta D}$

Y = the change in elevation between the free water surface in the reservoir and a horizontal reference plane usually passing through the flow line of the underdrain pipe.

D = the horizontal distance from the edge of the free water surface to the verticle reference plane (usually chosen passing through the center of the underdrain pipe).

Tne flow of water delivered to the drain is equal to the velocity (Ki) as it moves through the media, multiplied by the cross sectional area (A) of the filter. Contrary to the more simplistic situations analyzed earlier, this area changes not only in relation to the depth of the free water surface but also decreases in relation to the upper line of seepage as it moves toward the underdrain.

Hence, Darcy's Law is usually applied in the design of bank filters in much the same way as it is for determining seepage through an embankment. The media is assumed to be homogenous throughout and located on an impervious foundation (e.g., the bottom and sides of filter trenches are presumed impermeable). Since the depth of the saturated zone varies as it approaches the drain, the mean width is used to calculate the area factor used in these determinations.

When the bottom of the filter and the horizontal reference plane coincide, (A) is assumed to equal one-half the vertical distance (H) shown in Figure 6-52 multiplied by the length of the filter (L). Stated in mathematical form:

$$A = \frac{H\,L}{2}$$

Where: A = Mean cross sectional area of the saturated zone (ft^2)
H = Change in elevation or depth of the filter from the free water surface to the bottom of the filter (ft)
L = Length of the filter (ft)

The instantaneous rate of discharge (Q) is subsequently calculated at the various stages of drawdown or storage elevations in the pond. The greater the number of increments the more accurate the assessment is likely to be.

The formula for expressing the discharge through a unit length of filter media for each increment is:

$$q = K\,(\frac{\Delta Yn}{\Delta Dn})(\frac{Hn}{2})$$

When the elevation of the free water surface does not exceed the top of the filter, the value of (Hn) is equivalent to the change in elevation per increment of rise or fall in the storage area (i.e., $Hn = \Delta Yn$). The equation subsequently may be written:

$$q = \frac{K}{2}\,(\frac{Hn^2}{\Delta Dn})$$

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Where: q = discharge rate per unit length
K = hydraulic conductivity of the filter material comprising the least permeable section
Hn = change in elevation from the flow line of the drain or other reference point to the water level in the reservoir
Dn = horizontal distance measured from the edge of the free water surface to the vertical plane of reference (in this instance, the middle of the perforated pipe).

Values of (q) are multipled by the total length (L) of the filter system to determine the total discharge capacity (Q) of the facility. In equation form the relationship may be stated:

$$Q = (q)(L)$$

In some situations, the bottom of the filter is located below the flow-line of the pipe. In these instances, the value of (H) will exceed (Yn). The mean discharge area may be determined as follows:

$$A = \frac{(H - \Delta Y) + H}{2} L = (H - \frac{\Delta Y}{2})L$$

In either case, the instantaneous discharge is averaged between each increment. The drawdown time is then determined by dividing the volume of storage available in the reservoir between stages by the mean rate of outflow projected through the filter.

Similar to previous examples presented in this section, Table 6-15 shows how the drawdown time would be calculated for a project designed to treat approximately 36,300 ft^3 or 10 acre inches of runoff. By comparison, it may be seen that bank filtration is not nearly as hydraulically efficient as a means of treatment as bottom filters or underdrains. Earlier it was shown that only 200 ft. of bottom filter would be needed to drain an equivalent amount of water within 72 hours. However, a 75% increase in length (350 ft.) of bank filter is required to accomplish the same task even though the hydraulic conductivity of the media is presumed to be more than five times greater than the earlier example.

The designer should be aware that the configuration of the system itself can have substantial influence on the hydraulic efficiency of these facilities. Most of these systems are relatively low head since they are normally designed with little more than 2 feet of elevation difference between the maximum stage in the facility and the bottom of the filter. Consequently, there is often only a very slight energy gradient to move water toward the drain. In such situations elongated envelopes (see Figure 6-53) are often used to provide higher internal gradients and improve the flow of water through these structures. The higher discharge capacity decreases the length of filter needed to satisfy drawdown requirements.

TABLE 6-15

Incremental Method for Calculating Drawdown Time for Bank Filters Using Darcy's Equation

Increment	Storage Vol. (ft^3)	Storage (ft^3)	Incremental (1) Dist. "ΔD" (ft)	Change in Elev per (1) Increment "ΔY" (ft)	Hydraulic (2) Gradient "I" (ft/ft)	Hydraulic Conductivity "K" (ft/hr)	Avg Discharge (3) Area "A" (ft^2)	Instantaneous Discharge Q = KIA (ft^3/hr)	Avg. Discharge (4) Per Increment "Q" (ft^3/hr)	Drawdown Time (5) "t"/Increment (Hrs)
1	36,312		2.0	3.0	1.0	5.0	525	2625		
		9,690							2089.07	4.64
2	26,622		3.5	2.5	.71	5.0	437.5	1551.11		
		9,276							1126.57	8.23
3	17,346		5.0	2.0	.40	5.0	350	700.00		
		8,871							500.96	17.71
4	8,475		6.5	1.5	.23	5.0	262.5	301.88		
		8,475							207.82	40.78
5	0		8.0	1.0	.13	5.0	175	111.75		
		36,312 TOTAL								71.36 TOTAL

Notes: Pond with Top Length = 150'
Top Width = 132'
Depth 1/2" Storage = 2.0'
Side Slopes 3:1
Rectangular Shaped
Assume 350' of filter is used (L = 350 ft)

(1) Values of D and Y are illustrated with Figure 6-52.

(2) Hydraulic Gradient $I = \frac{\Delta Y}{\Delta D}$, I (Max) = 1.0

(3) Avg. "A" = $\frac{\Delta Y}{2} \times L$

(4) Avg. Discharge $Q' = \frac{Q(s) + Q(s+1)}{2}$

(5) Drawdown time = $\frac{\text{Storage}}{Q'}$

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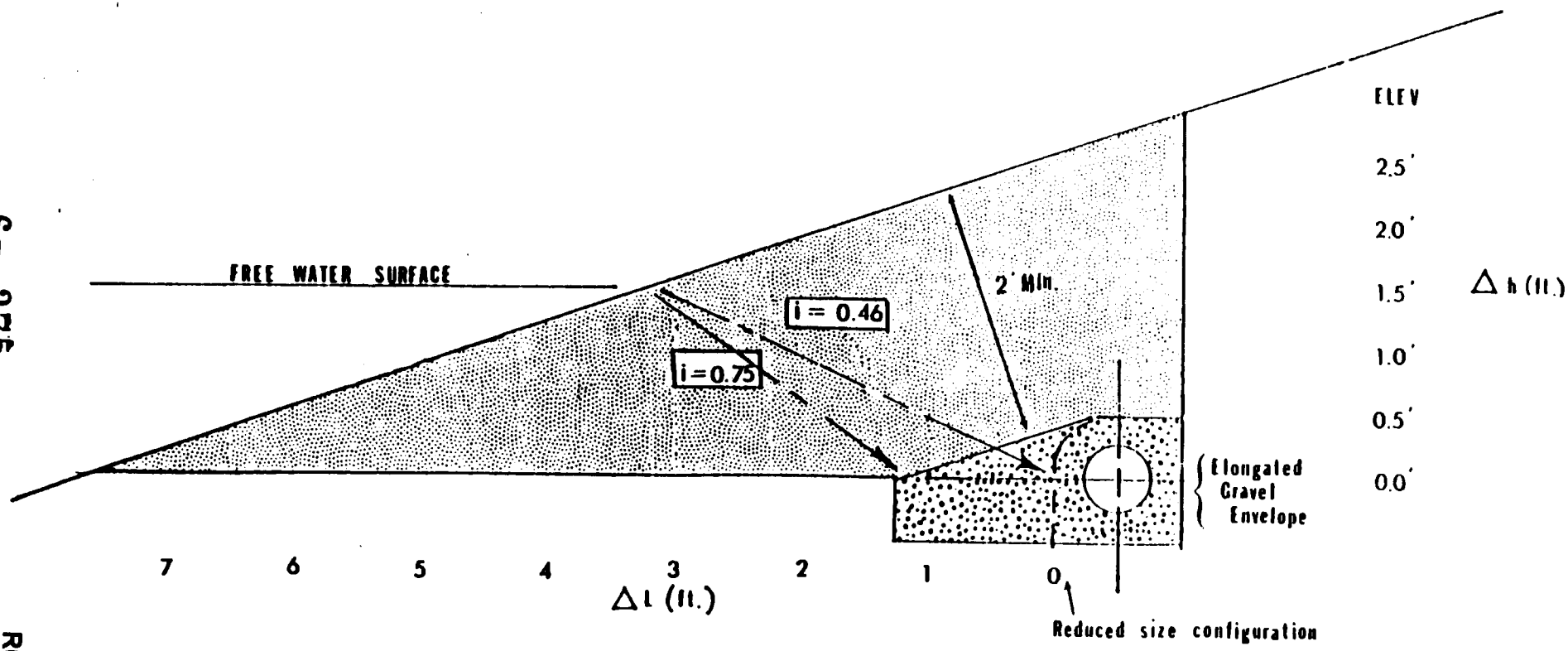
FIGURE 6-53

Elongated Gravel Envelope to Provide Improved Internal Gradient for Low Head Bank Filtration Systems



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b) Flow Nets

Another commonly used method for evaluating problems related to seepage through porous media involves the construction of flow nets. This type of analysis can also prove to be a valuable tool for the design of stormwater filtration systems. A diagram of a flow net constructed for a rather commonly used bank filter design is illustrated in Figure 6-54. Those interested in developing skills in flow net analyses for this and other configurations of bank filters may find Seepage, Drainage, and Flow Nets by H.R. Cedergren to be a vaulable reference.

Flow nets may be applied in sizing a bank filter in the same manner as Darcy's Law was used earlier. A number of diagrams are constructed, each correlating to various stages within the reservoir. The individual diagrams are then used to determine the discharge relationship per linear foot of filter. The flow net equation may be written:

$$q = KH \frac{nf}{nd}$$

Where: q = seepage quantity ($L^3/T/ft.$ of filter)
K = permeability of the media (L/T)
H = net head (L) as illustrated in Figure 6-54
nf = number of flow channels
nd = number of equipotential drops

The ratio nf/nd is otherwise known as the shape factor. As noted by Cedergren, the number of flow channels and the corresponding number of equipotential spaces depends on the shape of the cross section, and will not necessarily be a whole number. A different shape will produce a different number of spaces and channels. He goes on to warn those who are just learning by stating that novices "sometimes overlook one or more of the basic rules. The resulting flow net can be so filled with errors that a grossly distorted picture of a seepage pattern will be given". However, he also points out that any number of flow nets for a given problem will agree when the work has been done correctly. There is but one solution to a given problem. Consequently, although this work may be quite cumbersome at first, once flow nets have been constructed for a given configuration of filter they will continue to apply to the specific design or shape as long as they are not changed.

Once the unit rate of discharge (q) is established at each increment of drawdown the total stage discharge relationship may be determined by multiplying the value of (q) at each stage by the length of the filter (L). The instantaneous discharge Q is averaged between each increment. Assuming the volume of storage between increments is known, the drawdown time (t) may be calculated by dividing the volume by the average rate of outflow in the same manner as illustrated in Table 6-15. Here again, the preparation of such a table is an aid to any reviewing agency and can help speed up project approval. Preliminary evaluations seem to show that flow net analyses may

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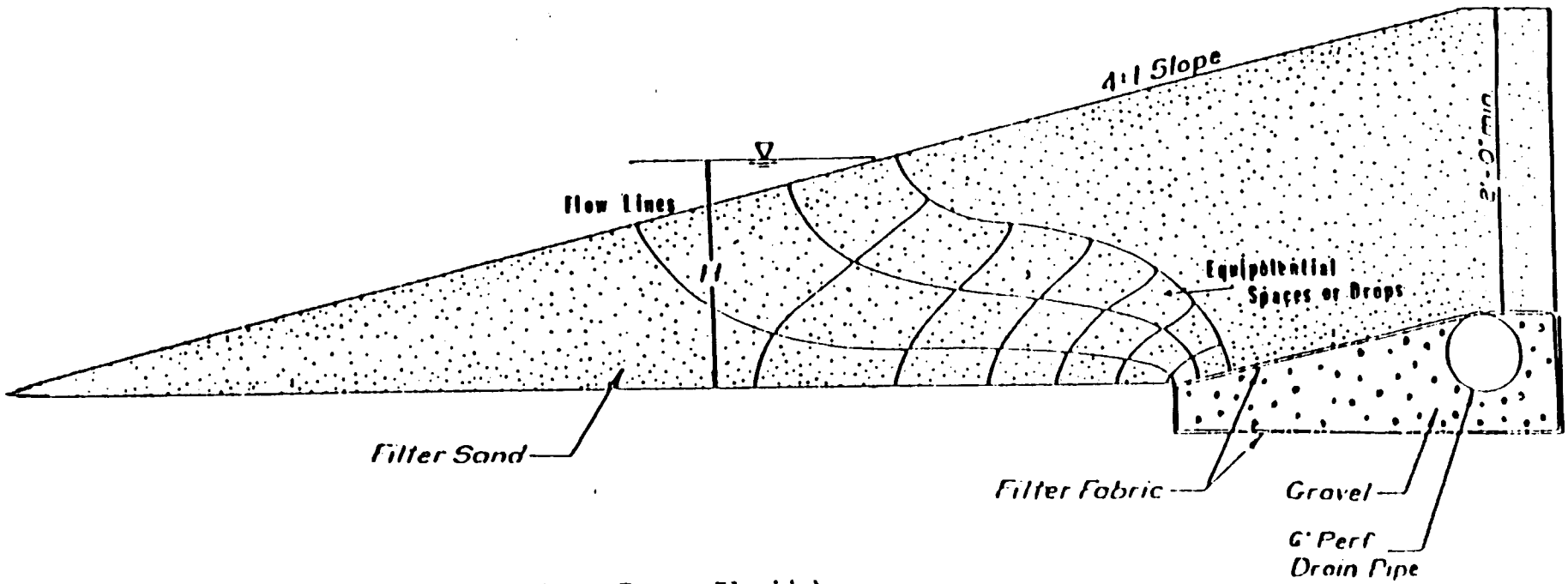
FIGURE 6-54

Flow Net Diagram Illustrating Lines of Seepage Through
a Typical Bank Filtration System



(Courtesy of Heidt and Associates, Inc., Tampa, Florida)

(Not to scale, for illustration only)

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offer benefits over the procedure described in section 2(a) when gradients of 100% or more are likely to occur over much of each filtration cycle.

c. Other Analytic Approaches

Currently several other methodologies being used to design underdrains that are not incremental in nature. In these instances several designers have modified the designs illustrated previously. This has enabled the use of equations in which drawdown time (t) or filter length (L) may be calculated in one step based on a single formula. Figure 6-55 illustrates the general design and important dimensions of two such systems.

The form of the expression used to estimate the length of filter trench (L) required to accomplish drawdown in the time desired is written as follows:

$$L = \frac{1.33\ Ar\ D}{KtW} \ln (Y_1/Y_2) \text{ for system (a), and;}$$

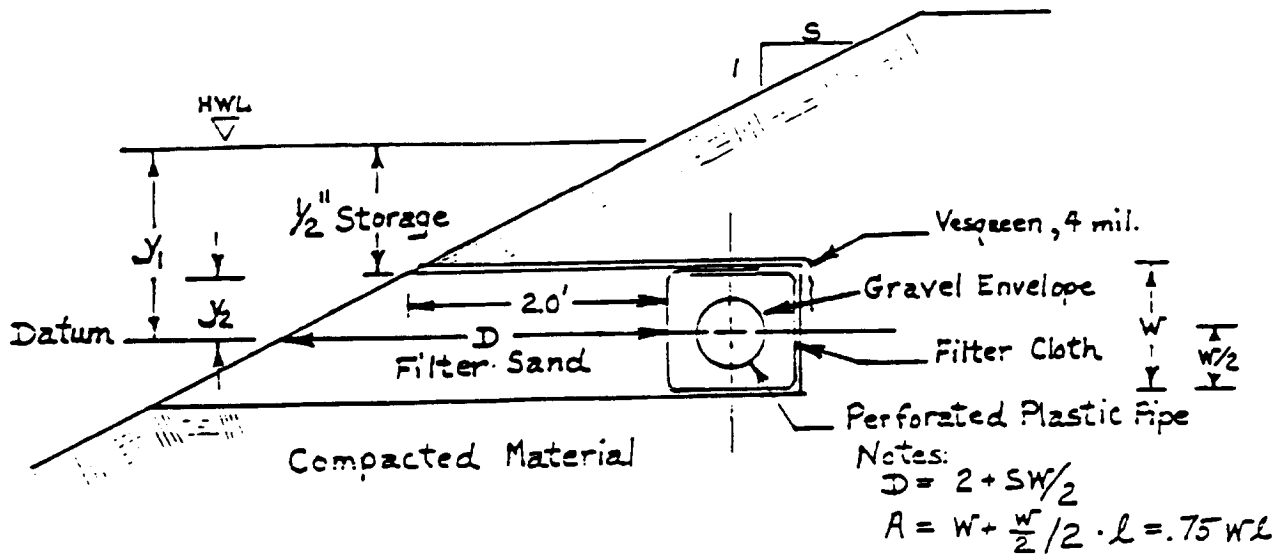
$$L = \frac{Ar\ D}{KtW} \ln (Y_1/Y_2) \text{ for system (b) Figure 6-55.}$$

A_r = Average area of reservoir between elevation Y_1 and Y_2 (ft^2)

Where: L = length of filter required (ft)
K = hydraulic conductivity of the filter media (ft/hr)
t = allotted drawdown time (hrs)
W = trench width as illustrated in Figure 6-55 (ft)
D = average distance which water must travel through the filter profile as shown in Figure 6-55 (ft)
Y_1= Difference in elevation between the flow-line of the underdrain pipe and the water level in the reservoir at the appropriate volume of storage (ft)
Y_2= Difference in elevation between the flow-line of the underdrain and the stage in the reservoir following discharge of the treatment volume required (ft)

It should be noted that the mean distance (D) traveled is used for calculations involving systems similar to that illustrated in Figure 6-55(a) while for the system shown in Figure 6-55(b) the distance is equal to 2.0 feet. However, the difference in the form of each equation is primarily due to differences in the magnitude of the cross section visualized to be intersected by the drain in each situation. In Figure 6-55(b) the trench is perpendicular to the face of the bank. Flow through the filter, toward the drain is predominantly vertical. The entire cross-section or width (W) of the filter is intersected by the drain and its surrounding gravel envelope. Flow is primarily normal to the plane of reference. In these circumstances, the discharge area remains relatively constant as water moves toward the drain. The phreatic surface will be parallel to the upper trench wall, intersecting nearly the entire width of the drain before curving toward the drain tube itself. The presumption that A = WL is primarily correct in this circumstance.

(a) Reduced Head System



(b) Side-of-the-Bank System

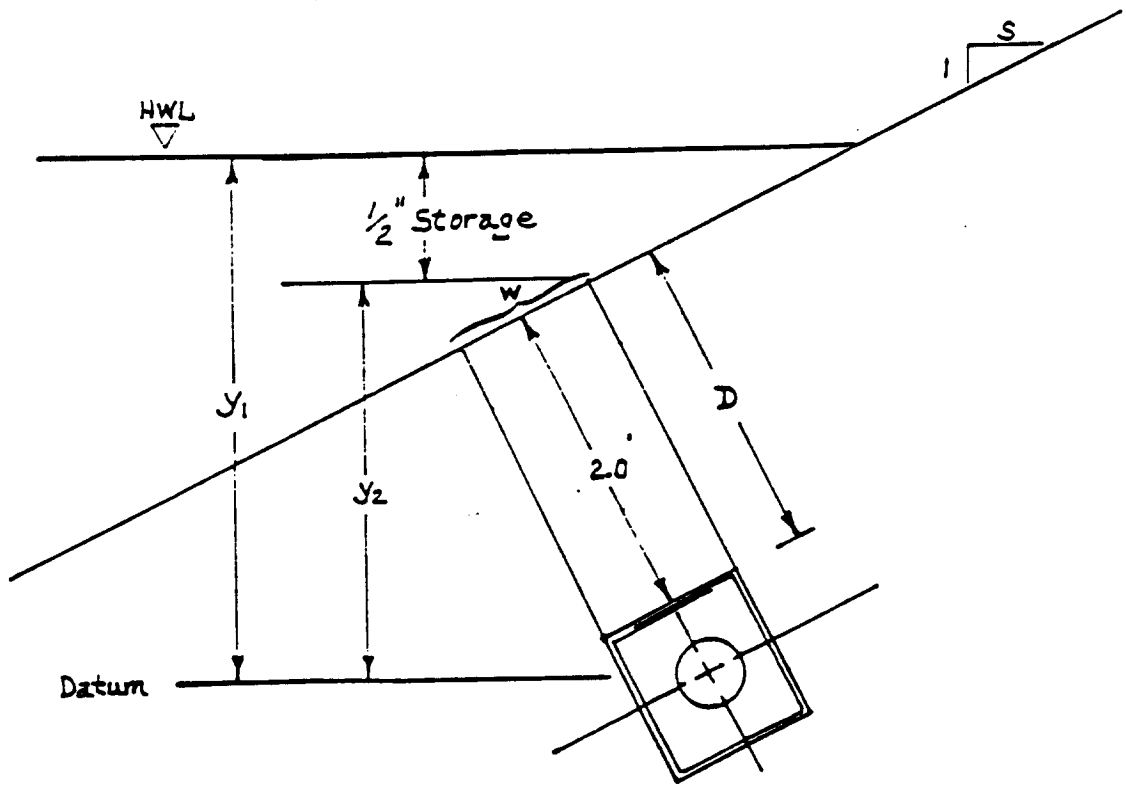


FIGURE 6-55

Sketch of Bank Filter Designs Illustrating Symbols for Use With Single Step Evaluation of Trench Length and Drawdown Time

(Courtesy of Post, Buckley, Schuh and Jernigan Engineers, Clearwater, Florida)

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On the other hand, this assumption does not pertain in the horizontal flow situation shown in Figure 6-55(a). The reference plane (passing through the flow line of the pipe when full flow is assumed) does not intersect the entire cross-section or width of the filter. Flow is primarily parallel to the plane of reference. In these circumstances the width of the saturated zones is reduced as water moves toward the drain. The average discharge area (see notation with figure) should be used in this situation. The presumption that the discharge area (A) is equal to the entire width (W) of the drain times its length (L) would be correct only in the event that the water level was expected to be at the top of the trench during operation. This assumption is pertinent to submerged drains only. The latter situation would not be recommended because of added difficulties in the design, installation, operation and maintenance of these systems due to constant anaerobic conditions.

When the length of the system is known, the equations may be rearranged to solve for the drawdown time associated with the system as follows:

$$t = \frac{1.33\ Ar\ D}{K\ W\ L} \ln Y_1/Y_2 \text{ for system (a)}$$

$$t = \frac{Ar\ D}{K\ W\ L} \ln Y_1/Y_2 \text{ for system (b)}$$

Similar to using other forms of Darcy's Law when the length and drawdown constraints are predetermined, the equation may be used to establish the required permeability. In this instance the designer would establish a trial thickness of the filter and calculate the hydraulic conductivity needed to satisfy these requirements. Likewise, the designer may select one or more permeabilities that represent commercially available filter materials within acceptable degrees of uniformity and effective size (as outlined in 17-25.025(2) F.A.C.) and calculate their required thickness.

3) Other Design Considerations

a) Pipe Size, Orifice Area, and Filter Cloth

The design procedures discussed in section 1 and 2 of this BMP are all primarily associated with the capability of the filter media to transmit water. The permeability associated with filter cloth (when used), the size and number of orifices or perforations in the drain pipe, and the capacity of the pipe itself can also limit the rate of discharge. Each of these factors must be checked as described in section 1(a) and (b) of the design criteria to also ensure that these factors will not effect drain requirements.

b) Safety Factors

Permeability is crucial to all of the design procedures. However, as noted by Cedergren, "Permeability can vary so widely that its physical significance is often difficult to comprehend,..." In this instance, the author was referring

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to the differences in the properties of various aggregates (sand, clay, gravel, etc). However, tests of similar types of materials show that even these percolation rates may vary by 100% or more. In the light of the large margin of discrepancy associated with most design techniques and rest results, safety factors on the order of at least two are appropriate. Drawdown time on the order of one-half of what is required should be encouraged.

c) Pollution Control

Filters for stormwater treatment are designed to remove particulates and their associated pollutants from the runoff waters as they percolate through the fine textured aggregate on its way to the drain tube. According to preliminary indications based on information published by Dr. Y.H. Chen et.al (1981) "a layer of soil can stop the passage of a particle if the size of this particle is larger than one-fifth of the size of particles establishing the soil layer". Using the effective size (D_{10}) requirements specified for filters in Chapter 17-25 F.A.C. it is expected that particles on the order of .04 to .10 mm. may be removed. According to grain size distribution data for pollutants associated with street surface contaminants (Sartor and Boyd, 1972), more than 90% of the suspended and oxygen demanding materials found in urban stormwater should be removed. Preliminary information reported from an in-line filter system installed on a tributary to Lake Jackson near Tallahassee supports this conclusion.

Soluble pollutants are not removed so readily. However, in general, the more fine textured the media, the better the pollutant removal expected. When designing a filter system, these considerations, as well as, the form of contaminants to be removed from the stormwater, should be balanced with the improved hydraulic capacities which are concommittent with more coarse grained, even-graded filter media.

d) Filter Fabric and Piping Control

Filter cloth must also contain pore spaces which will not permit the filter media (sand) to be carried away by the water. The Corps of Engineers and Yung Hal Chen, Daryl B. Simons, and Phillip M. Demery in "Hydraulic Testing of Plastic Filter Fabrics" discuss valuable information pertaining to the proper selection of these materials. Several important guidelines are summarized as below:

1) In order for filter fabric to work as a permeable constraint to stop adjacent particles of filter material from washing through the fabric, the EOS (equivalent opening size of the fabric) divided by the D_{85} of the sand should be less than or equal to two.

$$EOS/D_{85} \leq 2$$

2) To avoid clogging by fine particles requires that the EOS of the fabric must be equal to or greater than twice the D_{15} of the filter material.

$$EOS \geq 2D_{15}$$

Planning an Underdrain or Filter System

Analyzing Information and Data from Surveys and Investigations

In most humid areas, many years of experience with subsurface drainage installation have provided the main basis for determining drainage requirements for various soil types and problem areas. Special investigations are necessary for drainage of soils where experience is lacking. One of the most important phases of planning either an underdrain or stormwater filtration system is to compile and analyze the field data collected through various surveys, investigations and studies. These investigations are difficult because subsoil and groundwater conditions are not evident through visual inspection. Various methods and techniques have been developed whereby these conditions can be determined and made evident through a graphical or statistical presentation. The following is a discussion of some of the methods and procedures commonly used.

1) Water Table Contour Maps - The elevation of the water table at selected points covering the area are plotted on the base map. By interpolation and extrapolation lines of equal water table elevation are drawn. The completed map represents the surface configuration of the water table at a specific time.

   To be of greatest use as a tool in planning, groundwater contour maps should be superimposed on topographic maps to give the relationship between surface configuration and water table configuration. An example of this type of map is shown in Figure 6-56. The completed map will show areal delineation of depth to groundwater which is usually the criteria for determining maximum allowable depth of stormwater filters.

2) Observation Well Hydrographs - On profile paper, cross-section paper or printed hydrograph sheets, plot water table elevation against time. Well hydrographs may be compiled for all observation wells or for a few selected wells at key locations. The time scale, which is usually on the abscissa (horizontal), is in days by months for one year's time. The ordinate (vertical) is used for water table elevation and is in feet and tenths. The completed hydrograph shows water table fluctuation by seasons: the high level and the low level for the season.

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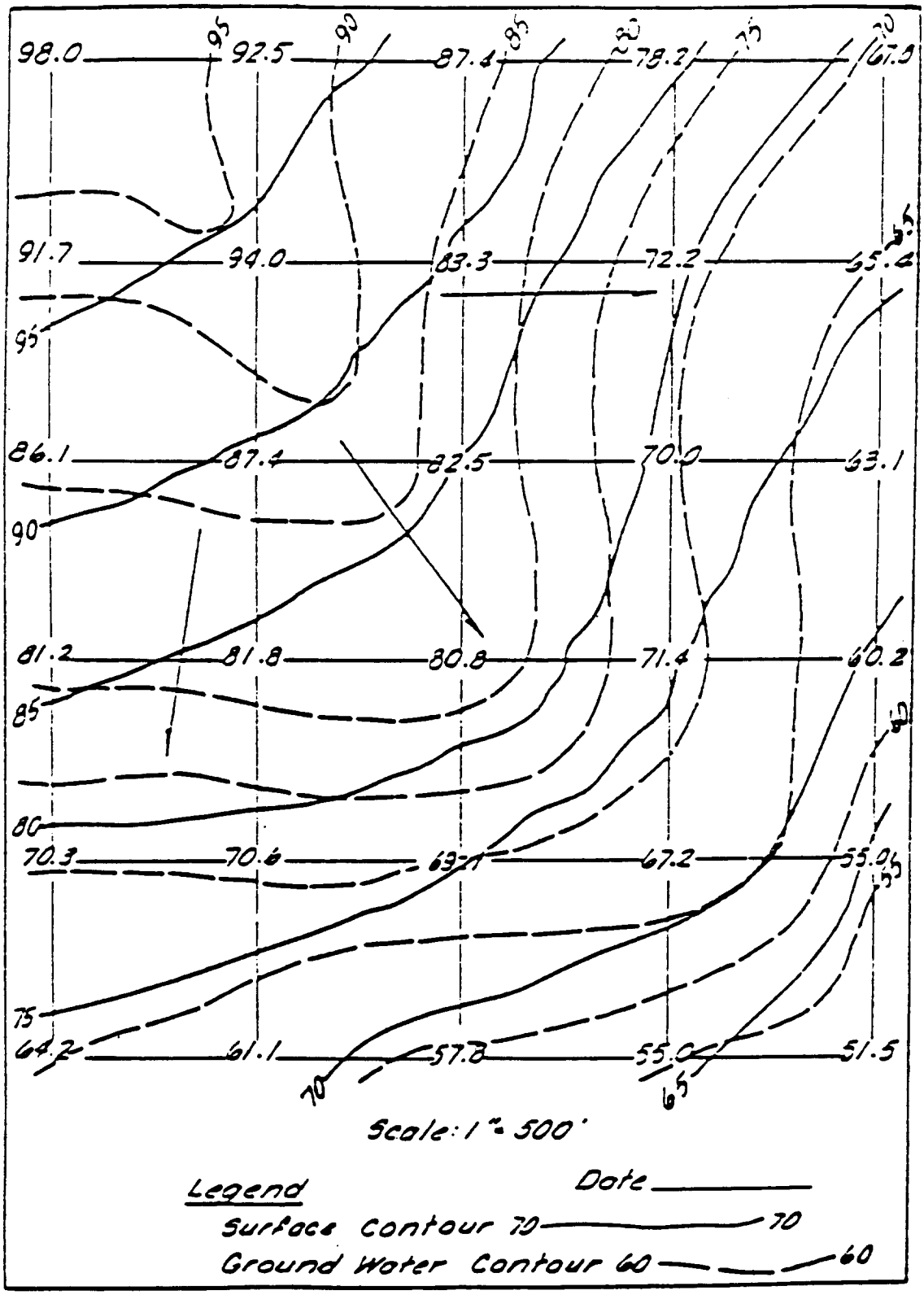

FIGURE 6-56

Typical Water Table Contour Map

R0071311

It is often very helpful in determining the source of groundwater.

Even when compiled from wells not exactly located on the immediate grounds, this data may aide in the interpretation of more short term instantaneous water table elevation mapping information. Knowledge related to seasonal fluctuations of high water table conditions can help prevent the under design and consequential bypassing of these stormwater treatment systems due to an influx of water not normally expected to occur and left unaccounted for in drain size analyses.

3) Profile Flow Patterns - Profile flow patterns may be shown by plotting the surface of the ground, information on subsoil materials, and hydraulic-head values at points where measurements have been made with piezometers. Lines should be drawn to connect points of equal hydraulic head. Convenient hydraulic-head intervals may be selected extending over the range of measured values for hydraulic head. Usually an interval is selected that allows a number of equal hydraulic-head lines to be sketched on the same profile. The component of flow in the plane of the profile is normal to lines of equal hydraulic head if the profile section is plotted on a one to one scale. Using this scale, flow lines can be sketched in at right angles to the equal hydraulic-head lines, with arrows to show the direction of flow.

A vertical component of flow is indicated where the hydraulic-head changes. This component may be either up or down. Profile flow patterns are very helpful in detecting artesian conditions, which is particularly an important consideration in determining the size, shape, and spacing of laterals in underdrain system design.

4) Gradation and Permeability Tests Results - Mechanical analysis (sieve size) is important for both filter and underdrain design. The results of tests run on the soils to be underdrained or the sand or other fine textured aggregate used for filtration are recorded and plotted on a grain size distribution chart as illustrated in Figure 6-57. Shown on the vertical scale at the left of the graph is the percentage of a soil or sand sample passing each of a number of increasingly smaller (in opening size) screens or sieves. A curved line connecting the points is shown for easy interpretation of percentages related to sizes in between the size separates.

This data is subsequently used to verify that the filter media conforms to state requirements listed in Section 17-25.025(2) pertaining to effective size and coefficient of uniformity. In both underdrain and filter design such information is also useful to help evaluate the capacity of a given configuration and to avoid potential piping of the filter sand or soil into the drain.

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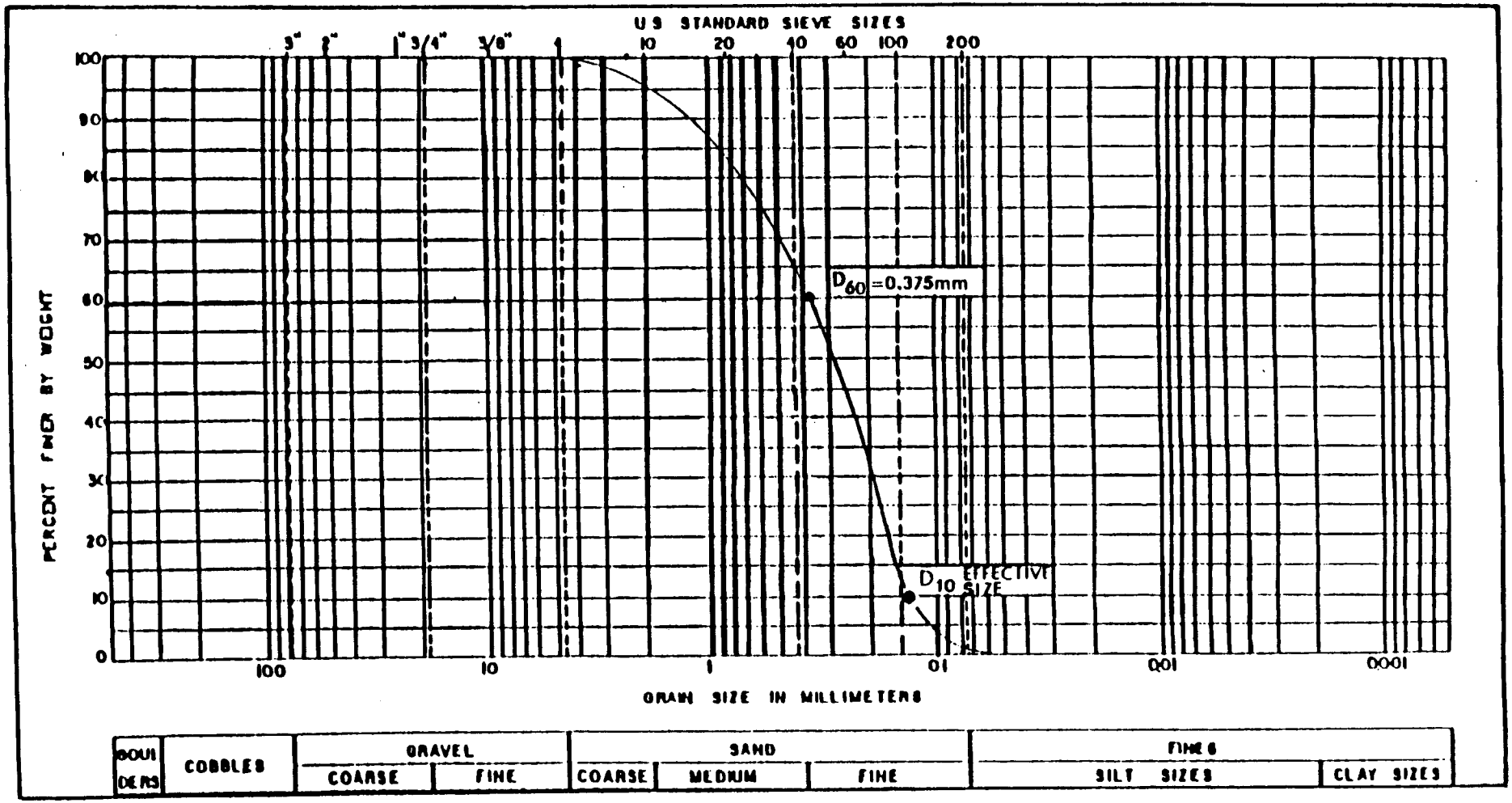
FIGURE 6-57

Typical Grain Size Distribution Chart



Sample 1: Light tan, fine-medium quartz sand

D_{10} = 0.15

$C_u = 2.5\ (D_{60}/D_{10})$

R0071313

Likewise, information pertinent to the capacity of a particular soil or filter sand to conduct or transmit water is quite important. There are a number of ways in which the permeability rate may be determined. Discussions of the applicable techniques are included in most soil mechanics texts. In this manual several of the more common field testing procedures are discussed in more detail in Appendix 6-2. Field testing is usually preferred for underdrain design while laboratory methods are most often used for establishing the hydraulic conductivity (K) of filter media.

Salt-water Intrusion in Coastal Areas

When planning a filter or underdrain design system in areas in close proximity to sea coasts, certain precautions must be considered in regard to salt-water intrusion. Beneath coastal areas, the normal movement of fresh ground water toward the sea usually prevents landward intrusion of the denser sea water; however, pumped well drains or pumped surface and subsurface drainage can reverse this situation. If this happens, the consequences can be serious since land once subjected to salt-water intrusion is difficult to reclaim.

Guidelines for Prevention - In coastal areas salt-water is present in underground strata at a depth equal to about forty times the height of fresh water above sea level. This is given by the Ghyben-Herzberg relation.

This relationship is only approximate because the density of sea water varies with temperature and the salts present. However, the ratio of 40.0 to 1.0 is adequate, as a general rule, for the purposes discussed here. In coastal areas, lowering of the water table one foot will cause a 40-foot rise in the fresh water-salt water interface. Lowering of the water table to mean sea level will bring the interface up to mean sea level which will in most cases render the land salty and unfit for many uses.

As a general guide for use in planning pumped stormwater systems near the coast, sumps should not extend below mean sea level. Filters and underdrains should be designed and developed for minimum drawdown of the water table and be located so that drawdown is distributed as widely as possible and not concentrated in specific areas.

Outlets for Underdrains and Filters - An outlet for the stormwater system must be available for gravity flow or by pumping. The outlet must be adequate for the quantity and quality of the effluent to be disposed of without causing damage to other areas and with minimum deterioration of the water quality in the outlet.

An open-ditch outlet for gravity flow from a buried drain should permit discharge from the drain above the elevation of normal flow in the outlet. Interruption of flow from the drain due to storm runoff in the outlet should

not occur so often and with such duration that the rate of drawdown by the buried drain would fail to meet the design requirements specified in Chapter 17-25 F.A.C. during most situations.

Construction and Materials Specifications for Underdrains and Stormwater Filtration Facilities

General

The location of the main drain and laterals should be planned to obtain the most efficient and economical drainage system. A few general rules to follow are:

1) Provide the minimum number of outlets.

2) When practical lay out the system with a short main and long laterals.

3) Orient the laterals to use the available slope to the best advantage.

4) Follow the general direction of natural waterways with mains and submains.

5) Avoid locations that result in excessive cut.

6) Avoid crossing waterways wherever feasible. If waterways must be crossed, use as near a right-angle crossing as the situation will permit.

7) Where feasible, avoid soil conditions that increase installation and maintenance cost.

Laterals should be located in the direction for the most effective collection of excess water, with due regard to the grade required for prevention of sedimentation, and following the rule of long laterals with short mains where feasible. Where it is desirable for main drains to be located parallel to a ditch deeper than the drain, enough distance should be maintained between ditch and drain to prevent washouts in the drain. Submains may be used to eliminate crossing waterways and to reduce the number of lateral connections to the main.

Inspection and Handling of Materials

Material for drains shall be given a rigid inspection before installation. Bituminized fiber and plastic pipe and tubing shall be protected from hazards causing deformation or warping. All material shall be satisfactory for its intended use and shall meet applicable specifications and requirements.

Placement and Coarse Aggregate Bedding Requirements

All drains, both flexible as plastic tubing and non-flexible as clay and concrete tile, shall be laid to line and grade and covered with approved blinding, or filter material. A minimum 3-inch thick gravel envelope wrapped in filter cloth is suggested to improve flow into the drain. Either of the two methods below may be used.

1) Except as provided in Metnod 2 below, the bottom of the excavated trench shall be shaped or grooved. Flexible type drains, when placed, shall be embedded in undisturbed soil for approximately 60 degrees of their circumference. After placement of all types of drains, friable material taken from the trench spoil or cut from the trench side walls shall be placed around the drain in such a manner that it will completely surround and support the drain and fill the trench to a depth of 3 inches over the top of the drain. To be suitable, materials surrounding the drain must contain no hard clods, rocks, or fine materials which would cause a silting hazard in the drain.

2) When special shaping or grooving of the trench bottom is not provided to embed the drain when placed, the drain shall be laid directly upon the envelope material. A sufficient quantity shall be used to fill the trench to a depth of 3 inches surrounding the drain. Envelope material shall consist of coarse material, all of which shall pass a one and one-half inch sieve. FDOT No. 57 or equivalent is recommended. The material should be washed and contain no more than 1% silt, clay or organic matter. The aggregate should be hard, durable, and comply with the requirements for soundness specified in ASTM D-694-62. This provision is to determine that the aggregate is not susceptible to disintegration by water. The loss when subject to the Los Angeles abrasion test should not exceed 40%. Pre-Cenozoic limestones, dolomites, nor stone containing phosphate shall not be used.

The gap between tile or other drain pipe joints shall not exceed 1/4-inch for mineral soils or one-half inch for organic soils. Openings wider than these, occurring on the outer side of a curve in a tile line or due to tile irregularity, shall be permitted if they are covered with broken tile, fiber glass, or other suitable material.

The upper end of each drain line shall be capped with concrete or other durable material unless connected to a clean out structure or other facility.

Earth backfill or filter material shall be placed in the trench in such a manner that displacement of the drain will not occur after backfilling.

No reversals in grade of the conduit shall be permitted.

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Where the conduit is to be laid in a rock trench, or where rock is exposed at the bottom of the trench, the rock shall be removed below grade enough that the trench may be backfilled, compacted, and bedded; and when completed, the conduit shall be not less than 3 inches from rock.

Alignment

When change in horizontal alignment is required, one of the following methods should be used to minimize head losses in the line:

1) Use of manufactured fittings, such as ells, T's, and Y's.

2) Use of a gradual curve of the drain trench to prevent excessive gap-space.

3) Use of junction boxes or manholes where more than two mains or laterals join.

Connections

Manufactured connections or junctions for joining two lines should be used. It is good practice to lay a submain parallel to a large tile main (usually 10 inches or larger) to prevent tapping the large main for each lateral. Tapping a large tile is difficult, costly, and is frequently the cause of failure. Savings, through the elimination of large connections, usually will offset the extra cost of a submain. Smooth curves in tile lines and manufactured tile connections or junctions of less than 90° have been recommended in the past on the assumption that energy losses at the junction of tile lines would be reduced. Investigations show that the variation in energy loss for different angles of entry are insignificant from a practical standpoint when the main and lateral are of the same size and the drains are flowing full.

Loads on Drains

General

Drains installed in the ground must have sufficient strength to withstand the loads placed upon them. In underdrains, the load which usually governs the strength required is the weight of the earth covering the drain. The magnitude of the load which the drain can safely support depends upon the unit weight of the soil, or sand, the width and depth of the trench, and the method of bedding and installation of the drain. Where the drain is at shallow depths (3 feet or less) there is danger from impact loads from heavy equipment. All installations should be checked to ensure adequate loadbearing strength.

Frequently drain installations are made in wide trenches and at greater depths than is possible with the average trenching machine. Draglines, backhoes, and other equipment may be used for deep trenches. Trenches excavated by this equipment are wide and the greater loads to be placed upon the drain must be determined so that a drain of adequate strength may be selected.

Underground Conduits

Research on loads on underground conduits (including tile) has been carried on by Marston, Schlick and Spangler at Iowa State University. The results of their work are used in determining the loads on underground conduits and their supporting strength. Information regarding loads on conduits may be found in the following publications.

"The Structural Design of Underground Conduits," SCS Engineering Division, Technical Release No. 5.

Engineering Handbook, Section 6, "Structural Design," U.S. Department of Agriculture, Soil Conservation Service.

"Soil Engineering," by Merlin Grant Spangler, International Textbook Company, Scranton, Pennsylvania.

"Design Data - Loads and Supporting Strengths," American Concrete Pipe Association, Arlington, Virginia.

"Handbook of Drainage and Construction Products," Armco Drainage and Metal Products, Inc., Middletown, Ohio.

Classification of Conduits as to Rigidity

Conduits used for subsurface drains may be of several kinds of materials. One characteristic of these various conduits important in determining the load-bearing strength is the degree of flexibility. Two classes of conduits according to their flexibility are as follows:

1) Rigid conduits, such as concrete or clay, fail by rupture of the pipe walls. Their principal load supporting ability lies in the inherent strength or stiffness of the pipe.

2) Flexible conduits, such as corrugated metal pipes and certain types of plastic pipe, fail by deflection. Flexible conduits rely only partly on their inherent strength to resist external loads. When the pipe deflects the horizontal diameter increases which compresses the soil at the sides and thereby builds up passive resistance which in turn helps support the vertically applied load.

Bedding Conditions for Rigid Ditch Conduits

The supporting strength of a conduit will vary with bedding conditions. Two types of bedding are generally used in drainage work and each has a load factor which, when multiplied by the three-edge bearing strength, will give the safe supporting strength of the conduit.

1) Impermissible bedding is that method of bedding a ditch conduit in which little or no care is given to shape the foundation to fit the lower part of the conduit or to refill all the spaces under and around the conduit with granular material. The load factor for this type of installation is 1.1.

2) Ordinary Bedding is that method of bedding a ditch conduit in which the conduit is bedded with ordinary care in an earth foundation shaped to fit the lower part of the conduit for a width of at least 50% of the conduit breadth, and in which the remainder of the conduit is surrounded to a height of at least 0.5 foot above its top by granular materials that are shovel-placed and shovel-tamped to completely fill all spaces under and adjacent to the conduit. The load factor for this type of installation is 1.5.

When sand and gravel filter or envelopes are used, the foundation need not be shaped since the filter and envelope material are placed entirely around the conduit and provide for lateral pressures on the conduit. With this type of installation the supporting strength of the conduit is increased above the three-edge bearing strength. Depending on its gradation and the care used in placing the sand-gravel filter or envelope, the load factor will be in the range of 1.2 for a poorly graded envelope of irregular thickness to 1.5 for a well-graded material of uniform thickness around the drain. To be effective the gravel envelope should have a minimum thickness of 3 inches.

Bedding Conditions for Flexible Drainage Tubing

A flexible conduit has relatively little inherent load-bearing strength, and its ability to support soil loadings in a trench must be derived from pressures induced as the sides of the conduit deflect and move against the soil. This ability of a flexible conduit to deform and use the soil pressure to support it is the main reason that light-weight plastic drainage tubing can support soil loadings imposed in drainage trenches.

A flexible tubing must be installed in a trench in a way which insures good soil support from all sides. There must be no voids remaining which would permit the soil pressure from backfill to cause deflection of the tubing to the point of buckling. Most installations will be made with machinery, without requiring a man in the trench to position the tubing or place the bedding. Some modification of machinery designed for installation of rigid

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conduits usually is necessary to install flexible conduits efficiently. See tne section on installation of corrugated plastic drainage tubing.

Drain Grades and Velocities

Underdrains and filters are placed at rather uniform depths, therefore, the topography of the land may dictate the range of grades available. There is often an opportunity, however, to orient the drains within tne site in order to obtain a desirable grade. The selected grades should, if possible, be sufficient to result in a nonsilting velocity which experience has shown is about 1.4 feet per second.

The recommended minimum grades are as follows:

	Precent
4" drain	.10
5" drain	.07
6" drain	.05

On sites where topographic conditions require the use of drains on steep grades which will result in velocities greater than shown in the following table, special measures should be used to protect the line from undermining.

Maximum Permissible Velocity in Drains Without Protective Measures

Soil Texture	Velocity-ft./sec.
Sand and Sandy Loam	3.5
Silt and Silt Loam	5.0
Silty Clay Loam	6.0
Clay and Clay Loam	7.0
Coarse Sand or Gravel	9.0

The protective measures may include one or more of the following:

1) Use only drains that are uniform in size and shape and with smooth ends.

2) Lay the drains so as to secure a tight fit with the inside diameter of one section matching that of the adjoining sections.

3) Wrap open joints with tar impregnated paper, burlap, or special filter material such as plastic or fiberglass fabrics.

4) Select the least erodible soil available for blinding.

5) Use long sections of perforated pipe or tubing. (Bituminized fiber, plastic, asbestos cement, etc.).

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Materials for Drains

"Drains" include conduits of clay, concrete, bituminized fiber, metal, plastic, or other materials of acceptable quality.

The conduit shall meet strength and durability requirements of the site. Current specifications as listed below or as included in the specifications guide shall be used in determining the quality of the conduit.

The following specifications cover the products currently acceptable for use as drains or for use in determining quality of materials used in drainage installations: (Source USDA, SCS-FL).

Type	Specification
Clay drain tile	ASTM[1] C 4
Clay drain tile, perforated	ASTM C 498
Clay sewer pipe, standard strength	ASTM C 13
Clay pipe, extra strength	ASTM C 200
Clay pipe, perforated, standard and extra strength	ASTM C 211
Clay pipe, testing	ASTM C 301
Concrete drain tile	ASTM C 412
Concrete pipe for irrigation or drainage	ASTM C 118
Concrete pipe or tile, determining physical properties of	ASTM C 497
Concrete sewer, storm drain, and culvert pipe	ASTM C 14
Reinforced concrete culvert, storm drain, and sewer pipe	ASTM C 76
Perforated concrete pipe	ASTM C 444
Portland Cement	ASTM C 150
Asbestos-cement nonpressure sewer pipe	ASTM C 428
Asbestos-cement perforated underdrain pipe	ASTM C 508
Asbestos-cement pipe, testing	ASTM C 500
Bituminized fiber, perforated drainage pipe	Federal Spec.[2] SS-P-358a
Homogeneous perforated bituminized fiber pipe for general drainage	ASTM D 2311
Homogeneous bituminized fiber pipe, testing	ASTM D 2314
Laminated-wall bituminized fiber perforated pipe for agricultural, land, and general drainage	ASTM D 2417
Laminated-wall bituminized fiber pipe, physical testing of	ASTM D 2315
Plastic drain and sewer pipe, styrene rubber Perforations, if needed, are to be as specified in Fed. Spec. SS-P-358a	Commercial Standard[2] CS-228
Corrugated Polyethylene Pipe Small diameter through 6" Large diameter through 24"	ASTM F 405 ASTM F 667
Pipe, corrugated, aluminum alloy	Federal Spec. WW-P-402a
Pipe, corrugated, iron or steel, zinc coated	Federal Spec. WW-P-00405

Clay Tile - These specifications may be modified as follows: the freezing and thawing and absorption tests may be modified or waived.
Corrugated Polyethylene Pipe - SCS standards and specifications for perforated corrugated plastic pipe may be found under standard 606.

[1]American Society for Testing and Materials, 1916 Race Street, Philadelphia, Pa. 19103

[2]Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402

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Other Clay and Concrete Pipe

Bell and spigot, tongue and groove, and other pipe which meets the strength, absorption, and other requirements of clay or concrete tile as covered above, except for minor imperfections in the bell, the spigot tongue or the groove, and ordinarily classed by the industry as "seconds," may be used for drainage conduits provided the pipe is otherwise adequate for the job.

Foundation Requirements

Soft or yielding foundations shall be stabilized where required and lines protected from settlement by adding gravel or other material to the trench, placing the conduit on plank or other rigid supports, or using long sections of perforated or watertight pipe.

Envelopes and Envelope Material

Envelopes shall be used around drains where required for proper bedding of the conduit, or where necessary to improve the characteristics of flow of groundwater into the conduit.

Materials used for envelopes do not need to meet the gradation requirements of filters, but they shall not contain materials which will cause an accumulation of sediment in the conduit or render the envelope unsuitable for bedding of the conduit.

Auxiliary Structures and Drain Protection

The outlet shall be protected against erosion and undermining of the drain, against damaging periods of submergence, and against entry of rodents or other animals into the drain as shown in Figure 6-58. A continuous section of pipe without open joints or perforations (Figure 6-59) shall be used at the outlet end of the line and shall outlet above the normal elevation of flow in the outlet ditch.

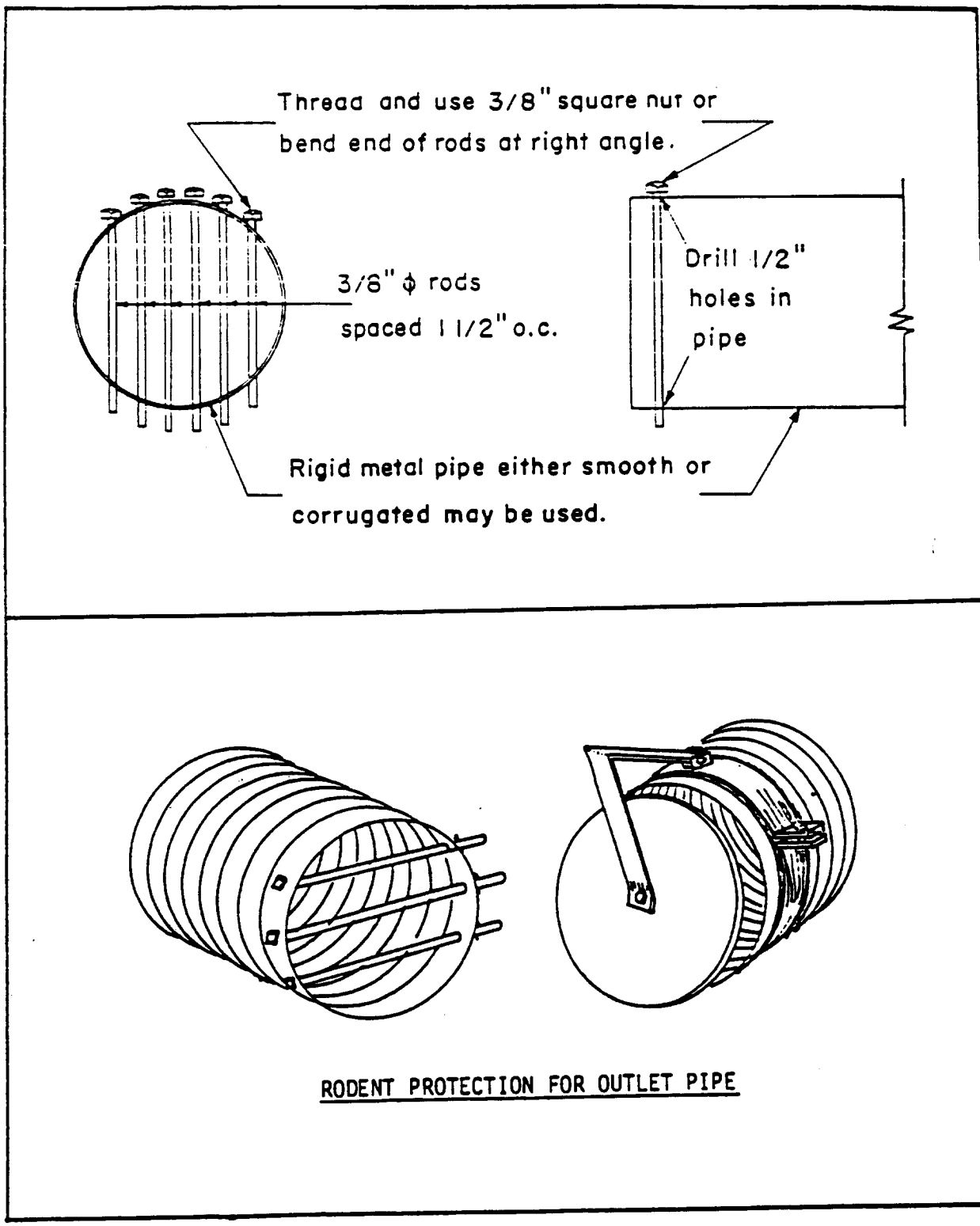
The pipe and its installation shall conform to the following requirements:

1) Where there is a hazard of burning to vegetation on the outlet ditch bank, the material from which the outlet pipe is fabricated shall be fire resistant. Where the hazard of burning is high, the outlet pipe shall be fireproof.

2) Two-thirds of the pipe shall be buried in the ditch bank and the cantilevered section shall extend beyond the toe of the ditch side slope or the side slope shall be protected from erosion. The minimum length of pipe shall be eight feet.

FIGURE 6-58

Rodent Protection for Outlet Pipe



RODENT PROTECTION FOR OUTLET PIPE

Source: USDA-SCS-FL

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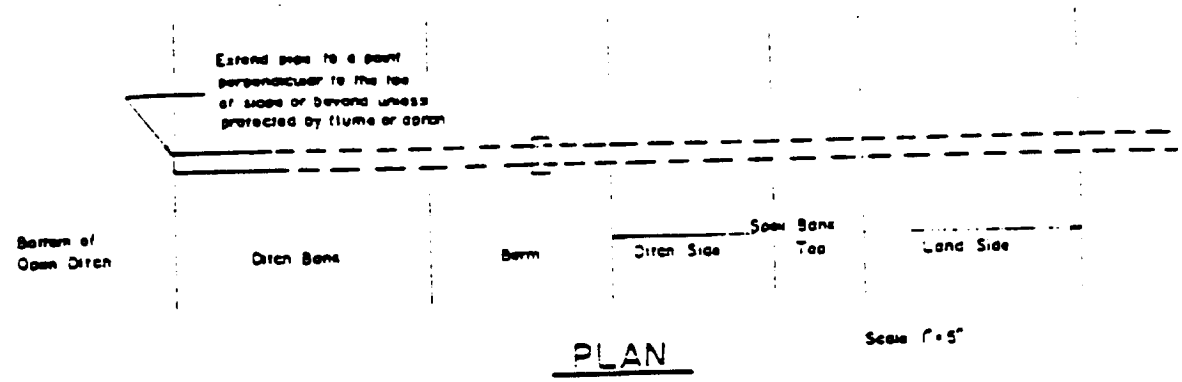
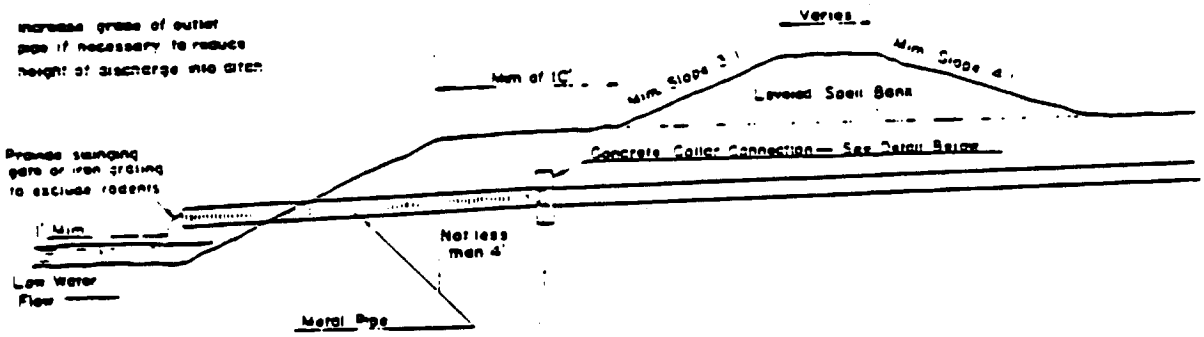
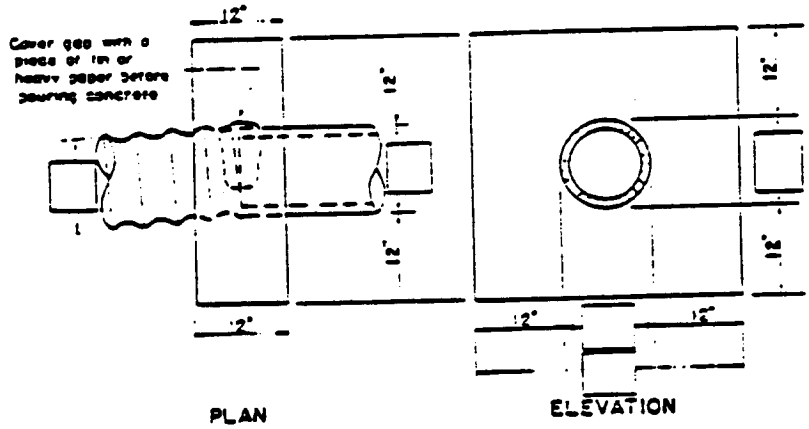


PLAN



SECTION



DETAIL-CONCRETE COLLAR

NOTE:
Rigid metal pipe either smooth or corrugated may be used.

If metal pipe is placed on a steeper slope than tile, same size may be used. Use pipe 2" larger than tile if on same slope.

If floating debris is a problem the metal pipe should be placed at approx. 30 degree angle facing downstream instead of as shown.

FIGURE 6-59

Metal Pipe Outlet and Concrete Collar

(USDA-SCS-FL)

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3) Where floating debris may damage the outlet pipe, the outlet shall be recessed to the extent that the cantilevered portion of the pipe will be protected from the current in the ditch.

4) Headwalls which are used for tile outlets shall be adequate in strength and design to avoid washouts and other failures.

Watertight conduit strong enough to withstand the loads upon it shall be used where subsurface drains cross under irrigation canals or other ditches. Conduits under roadways shall be designed to withstand the expected loads. Shallow drains through depressional areas and near outlets shall be protected against hazards of maintenance equipment.

Junction boxes shall be used where more than two main lines join.

Where surface water is to be admitted to drains, inlets shall be designed to exclude debris and prevent sediment from entering the conduit. Drain lines flowing under pressure shall be designed to withstand the resulting pressures and velocity of flow. Auxiliary surface waterways shall be used where feasible.

Headwalls

Headwalls shall be constructed on compact foundation and shall be of long lasting, durable materials such as steel piling, reinforced concrete, concrete block and sand cement riprap. The structures shall be designed to safely withstand expected loads.

Structure Capacity

Structures installed in tile lines must not unduly impede the flow of water in the system. They shall have a capacity no less than that of the line or lines feeding into or through them.

Where the tile system will carry surface waterflow, surface water inlets shall have a capacity no more than that required to provide the maximum allowable design flow in the tile line or lines.

Size of Structures

Junction boxes, manholes, catch basins, and sand traps shall be accessible for maintenance. A clear opening of not less than 2 feet shall be provided in either circular or rectangular structures.

Velocities in Structures

The tile system shall be protected against turbulence created near outlets, surface inlets, or similar structures. Continuous or closed-joint pipe shall

be used in tile lines adjoining the structure where excessive velocities will occur.

Screens and Trash Racks

Surface water inlet structures shall be equipped with screens, trash racks, or gratings to exclude debris.

Junction Boxes

Junction boxes shall be installed where more than two mains join, or where two mains join at different elevations.

Vents

Vents will be located at changes in grade, sharp changes in direction and at intervals along tile lines as needed. They shall be constructed as a tee with the riser pipe extending to ground surface or above. The riser pipe shall not be less than 4 inches in diameter. Each riser pipe shall be provided with a wire mesh or grating cover to prevent trash from entering the lines.

Maintenance of Filter and Underdrain Facilities

An underdrain filter system of adequate design and proper installation, using good material, still requires maintenance to keep it operating. Inspection of the drains, especially after heavy rains, should be made to see if they are working and if maintenance is required. Pore spaces in stormwater filters can be expected to seal with time following the beginning of operation. The duration of a filter's effectiveness before the hydraulic capacity is reduced to the point that drawdown requirements can no longer be met will depend on a number of factors including the initial permeability of filter material used, the degree of pretreatment (sedimentation) prior to entering the filtration facility, and the nature of the pollutants being removed.

Preliminary indication show that these systems can function for up to one year with only minor maintenance. However, periodic discing or scrapping the surface layers of the soil may be required following heavy events that carry heavy sediment loads.

Coarse grained systems may require complete replacement of the filter media to restore their function following clogging since pollutants would be expected to further penetrate these systems than their more close-grained counterparts. Most of the particulates will be trapped in the first 2 or 3 inches of the latter while suspended substances can be expected to penetrate up to a foot or more into the coarse-grained filter. Semi-annual restoration

efforts are likely to involve complete removal and cleaning and or replacement of the top 12 inches or more of the filter material. While major maintenance of this type may not have to be done as often, when it is required, the operation will involve a significant amount of labor and material. Heavy machinery may be needed if the facility is large and care will be needed to prevent damage to the underdrain pipes. There may be some problems associated with the ability of these more coarse-grained, evenly graded materials to support machinery needed to perform maintenance activities, such as scrapping without getting equipment stuck and/or damaging the filter bed.

Common causes of subsurface drainage system failures include the following:

1) Drains installed with insufficient capacity.

2) Drains placed too shallow and lack of auxiliary structures necessary for the installation.

3) Drains of insufficient strength or lacking in other qualities necessary for the installation.

4) Poor construction resulting in such inadequacies as too wide or too small a joint spacing, improper bedding, poor grade and alignment and improper backfilling.

5) Failure due to mineral deposits such as iron oxide. These deposits do not seriously affect the operation of the drain unless the perforations or joints become sealed. Usually indications of deposits may be observed at the outlets, junction boxes and inspection holes.

Hydraulic Cleaning - High pressure hydraulic nozzles have been used with success to clean tile drains in Florida that have evidence of iron oxide.

Silt and Vegetation - One of the most common maintenance problems that we have with tile drains in Florida is to get landowners to keep the outlets free of silt and vegetation where they empty into open ditches. The outlet end of the system must be kept clean if the maximum benefits from the tile are to be obtained. Sediment and fast growing aquatic vegetation might cause the outlets to become entirely plugged within one year after installation, consequently frequent inspections must be made.

Rodent Guards - Landowners often do not maintain the rodent guards. These appurtenances are sometimes removed, become rusted or plugged, and may never be replaced. These actions invite damage that can lead to the failure of the entire system. The outlet must be inspected periodically to make sure that it is clear, and that these guards are in place and functional.

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Trees - If trees near the drain are not removed at the time of construction, the tile may become plugged by roots. If it is found that the tile line is not functioning and the outlet is open, the lines should be checked near trees.

Auxiliary Structures - The life and value of a tile system many times depends on the repair of auxiliary structures. These structures are to protect the tile system as well as to aid in determining when maintenance is needed. If they are not maintained, the value of the installation will decrease. Regular inspection is required.

As-Built Plans - Upon completing a subsurface drainage installation and after all checks and inspection have been made, a set of "As-Built" plans, showing location, depths and sizes of all drains should be preserved and made available to those that will be maintaining the system.

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GUIDELINES FOR USING

EROSION AND SEDIMENT CONTROL PRACTICES

ES BMP 1.01

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

Definition

A stone stabilized pad located at points of vehicular ingress and egress on a construction site.

Purpose

To reduce the amount of sediment transported onto public roads by motor vehicles or runoff.

Conditions Where Practice Applies

Wherever traffic will be leaving a construction site and moves directly onto a public road or other paved area.



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Planning Considerations

Construction entrances provide an area where mud can be removed from constructio vehicle tires before they enter a public road. If the action of the vehicle traveling over the gravel pad is not sufficient to remove the majority of the mud, then the tires must be washed before the vehicle enters a public road. If washing is used, provisions must be made to intercept the wash water and trap the sediment before it is carried off-site. Construction entrances should be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by construction vehicles.

Design Criteria

Aggregate Size

FDOT aggregate No. 1 (1.5 - 3.5 inch stone) should be used.

Entrance Dimensions

The aggregate layer must be at least 6 inches thick. It must extend the full width of the vehicular ingress and egress area. The length of the entrance must be at least 50 feet. (See Plate 1.01a).

Washing

If conditions on the site are such that the majority of the mud is not removed by the vehicles traveling over the gravel, then the tires of the vehicles must be washed before entering a public road. Wash water must be carried away from the entrance to a settling area to remove sediment. A wash rack may also be used to make washing more convenient and effective. (See Plate 1.01b).

Location

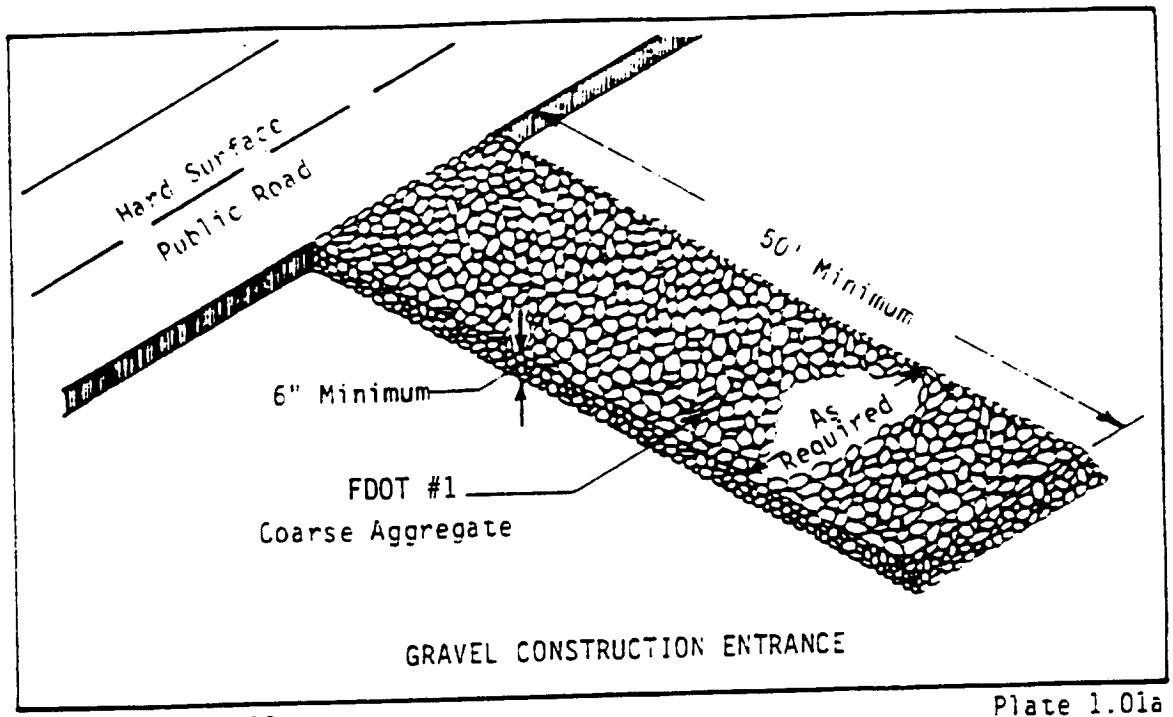
The entrance should be located to provide for maximum utility by all construction vehicles.

Construction Specifications

The area of the entrance should be cleared of all vegetation, roots, and other objectionable material. The gravel shall be placed to the specified dimensions. Any drainage facilities required because of washing should be constructed according to specifications. If wash racks are used, they should be installed according to manufacturer's specifications.

Maintenance

The entrance shall be maintained in a condition which will prevent tracking or flow of mud onto public rights-of-way. This may require periodic top dressing with 2-inch stone, as conditions demand, and repair and/or cleanout of any structures used to trap sediment. All materials spilled, dropped, washed, or tracked from vehicles onto roadways or into storm drains must be removed immediately.



GRAVEL CONSTRUCTION ENTRANCE

Plate 1.01a

Source: Va SWCC

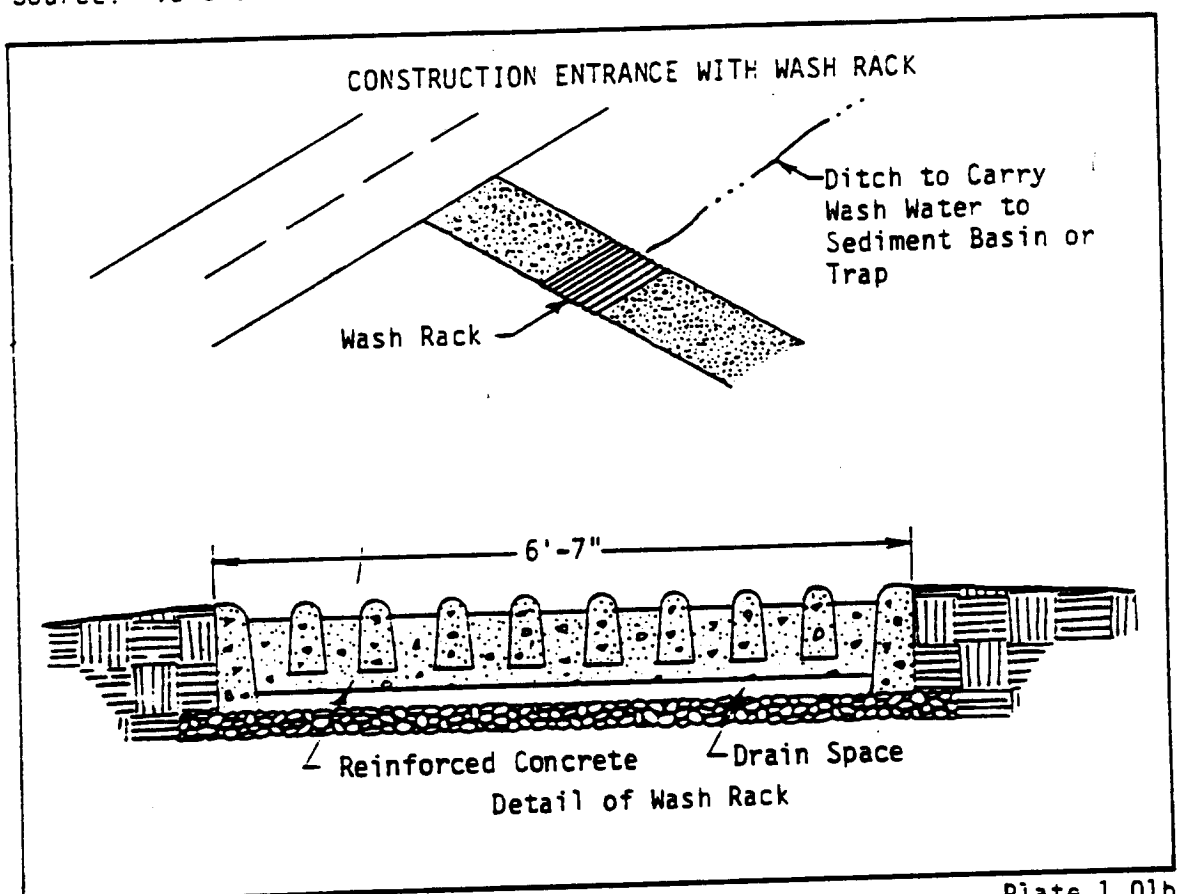


Plate 1.01b

Source: Smith Cattleguard Company

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ES BMP 1.02

CONSTRUCTION ROAD STABILIZATION

Definition

The temporary stabilization of access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes with stone immediately after grading.

Purposes

1. To reduce the erosion of temporary roadbeds by construction traffic during wet weather.

2. To reduce the erosion and therefore regrading of permanent roadbeds between the time of initial grading and final stabilization.

Conditions Where Practice Applies

Wherever stone-base roads or parking areas are constructed, whether permanent or temporary, for use by construction traffic.



R0071333

Planning Considerations

Areas which are graded for construction vehicle transport and parking purposes are especially susceptible to erosion. The exposed soil surface is continually disturbed, leaving no opportunity for vegetative stabilization. Such areas also tend to collect and transport runoff waters along their surfaces. During wet weather, they often become muddy quagmires which generate significant quantities of sediment that may pollute nearby streams or be transported off-site on the wheels of construction vehicles. Dirt roads can become so unstable during wet weather that they are virtually unusable.

Immediate stabilization of such areas with stone may cost money at the outset, but it may actually save money in the long run by increasing the usefulness of the road during wet weather.

Permanent roads and parking areas should be paved as soon as possible after grading. However, it is understandable that funds for this purpose may not be available in the early phases of the development project. As an alternative, the early application of stone may solve potential erosion and stability problems and eliminate later regrading costs. Some of the stone will also probably remain in place for use as part of the final base course of the road.

Specifications

Temporary Access Roads and Parking Areas

1. Temporary roads shall follow the contour of the natural terrain to the extent possible. Slopes should not exceed 10 percent.

2. Temporary parking areas should be located on naturally flat areas to minimize grading. Grades should be sufficient to provide drainage but should not exceed 4 percent.

3. Roadbeds shall be at least 14 feet wide for one-way traffic and 20 feet wide for two-way traffic.

4. All cuts and fills shall have side slopes that are stable for the particular soil. Slopes of 2:1 or flatter are recommended for clay soils and slopes of 3:1 or flatter are recommended for sandy soils.

5. Stormwater system shall be provided as needed and shall be designed and constructed in accordance with applicable regulations.

6. The roadbed or parking surface shall be cleared of all vegetation, roots and other objectionable material.

7. A 6-inch course of FDOT No. 1 aggregate shall be applied immediately after grading or the completion of utility installation within the right-of-way. Filter fabric may be applied to the roadbed for additional stability in accordance with fabric manufacturer's specifications.

Permanent Roads and Parking Areas

Permanent roads and parking areas shall be designed and constructed in accordance with applicable Florida Department of Transportation (FDOT) or local criteria except that an initial base course of gravel of at least 6 inches shall be applied immediately following grading.

Vegetation

All roadside ditches, cuts, fills and disturbed areas adjacent to parking areas and roads shall be stabilized with appropriate temporary or permanent vegetation according to the applicable ES BMPs contained in this handbook.

Maintenance

Both temporary and permanent roads and parking areas may require periodic top dressing with new gravel. Seeded areas adjacent to the roads and parking areas should be checked periodically to insure that a vigorous stand of vegetation is maintained. Roadside ditches and other drainage structures should be checked regularly to insure that they do not become clogged with silt or other debris.

ES BMP 1.05

STRAW BALE BARRIER

Definition

A temporary sediment barrier consisting of a row of entrenched and anchored straw bales.

Purposes

1. To intercept and detain small amounts of sediment from disturbed areas of limited extent in order to prevent sediment from leaving the site.

2. To decrease the velocity of sheet flows and low-to-moderate level channel flows.

Conditions Where Practice Applies

1. Below disturbed areas subject to sheet and rill erosion.

2. Where the size of the drainage area is no greater than 1/4 acre per 100 feet of barrier length; the maximum slope length behind the barrier is 100 feet; and the maximum slope gradient behind the barrier is 50 percent (2:1).



R0071336

3. In minor swales or ditch lines where the maximum contributing drainage area is no greater than 2 acres.

4. Where effectiveness is required for less than 3 months.

5. Under no circumstances should straw bale barriers be constructed in live streams or in swales where there is the possibility of a washout.

Planning Considerations

Based on observations made in Virginia, Pennsylvania, Maryland, and other parts of the nation, straw bale barriers have not been as effective as many users had hoped they would be. There are three major reasons for this.

Improper use of straw bale barriers has been a major problem. Straw bale barriers have been used in streams and drainageways where high water velocities and volumes have destroyed or impaired their effectiveness. Improper placement and installation of the barriers, such as staking the bales directly to the ground with no soil seal or entrenchment, has allowed undercutting and end flow. This has resulted in additions instead of removal of sediment from runoff waters (Plate 1.05a). Finally, inadequate maintenance lowers the effectiveness of these barriers. Trapping efficiencies of carefully installed straw bale barriers on one project in Virginia dropped from 57 percent to 16 percent in one month due to lack of maintenance.

There are serious questions about the continued use of straw bale barriers as they are presently installed and maintained. Averaging approximately $1.00 per linear foot, the thousands of straw bale barriers used annually in Florida represent sufficient expense that optimum installation procedures should be emphasized. If such procedures are carefully followed, straw bale barriers can be quite effective.

Design Criteria

A formal design is not required.

Construction Specifications

Sheet Flow Applications

1. Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.

R0071337

Plate 1.05a



FAILURE POINTS OF A POORLY CONSTRUCTED STRAW BALE BARRIER

R0071338

2. All bales shall be either wire-bound or string-tied. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales (in order to prevent deterioration of the bindings). See Plate 1.05b.

3. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked, the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier (Plate 1.05c).

4. Each bale shall be securely anchored by at least two stakes or rebars driven through the bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or rebars shall be driven deep enough into the ground to securely anchor the bales.

5. The gaps between bales shall be chinked (filled by wedging) with straw to prevent water from escaping between the bales. (Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency).

6. Inspection shall be frequent and repair or replacement shall be made promptly as needed.

7. Straw bale barriers shall be removed when they have served their usefulness, but not before the upslope areas have been permanently stabilized.

Channel Flow Applications

1. Bales shall be placed in a single row, lengthwise, oriented perpendicular to the contour, with ends of adjacent bales tightly abutting one another.

2. The remaining steps for installing a straw bale barrier for sheet flow applications apply here, with the following addition.

3. The barrier shall be extended to such a length that the bottoms of the end bales are higher in elevation than the top of the lowest middle bale (Plate 1.05d) to assure that sediment-laden runoff will flow either through or over the barrier but not around it.

Maintenance

1. Straw bale barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.

2. Close attention shall be paid to the repair of damaged bales, end runds and undercutting beneath bales.

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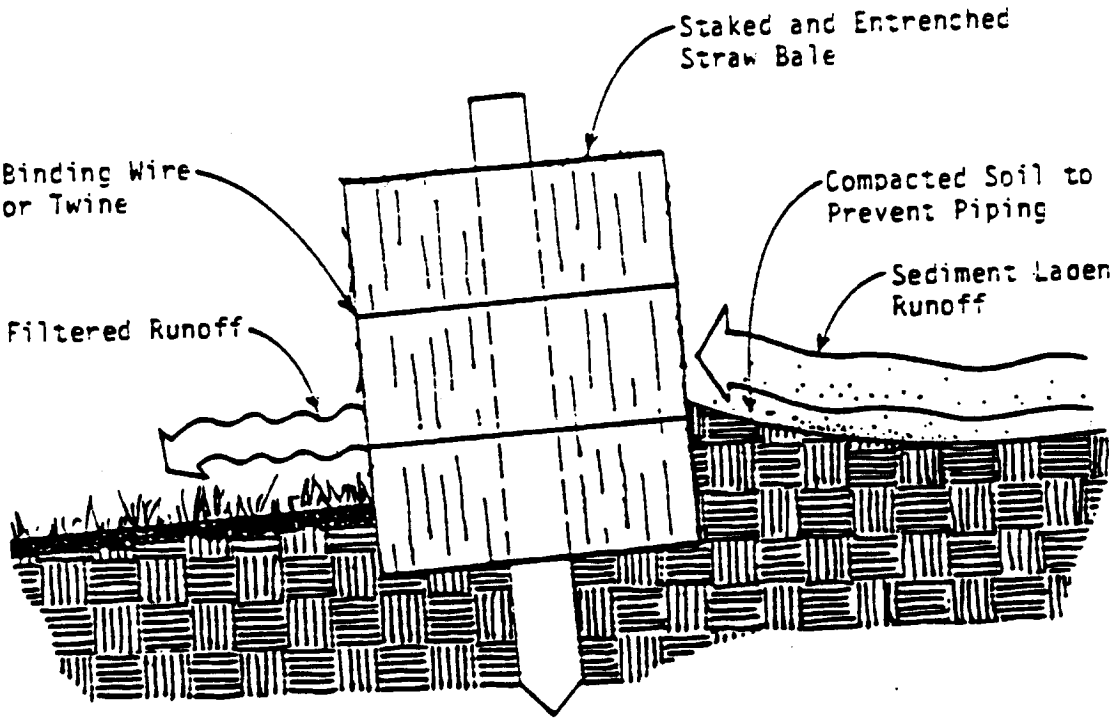


CROSS-SECTION OF A PROPERLY INSTALLED STRAW BALE

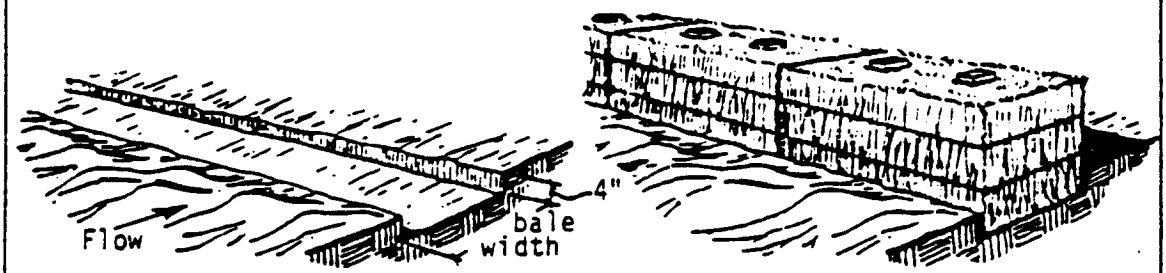
Plate 1.05b

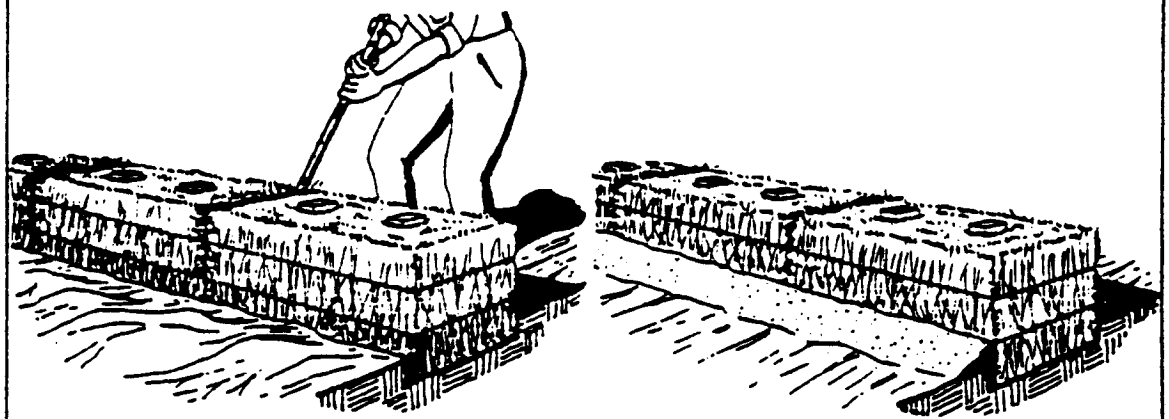
Source: Michigan Soil Erosion and Sedimentation Control Guidebook, 1975

R0071340

1. Excavate the trench.

2. Place and stake straw bales.





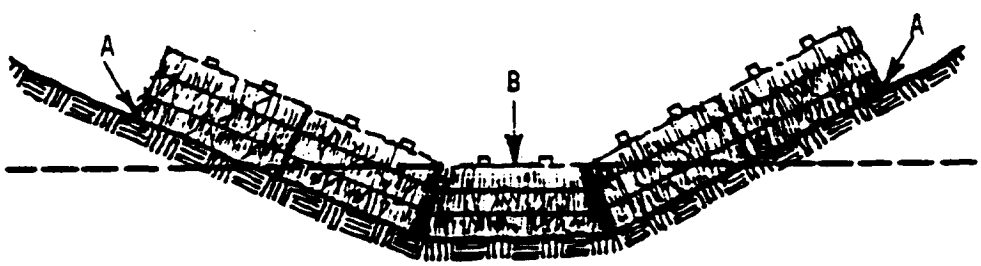
3. Wedge loose straw between bales.

4. Backfill and compact the excavated soil.

CONSTRUCTION OF A STRAW BALE BARRIER

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 1.05c



Points A should be higher than point B

PROPER PLACEMENT OF STRAW BALE BARRIER IN DRAINAGE WAY

Source: Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 1.05d

R0071341

3. Necessary repairs to barriers or replacement of bales shall be accomplished promptly.

4. Sediment deposits should be removed after each rainfall. They must be removed when the level of deposition reaches approximately one-half the height of the barrier.

5. Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.

ES BMP 1.06

SILT FENCE

Definition

A temporary sediment barrier consisting of a filter fabric stretched across and attached to supporting posts and entrenched. There are two types. The Silt Fence is a temporary linear filter barrier constructed of synthetic filter fabric, posts, and, depending upon the strength of the fabric used, wire fence for support. The Filter Barrier is constructed of stakes and burlap or synthetic filter fabric.

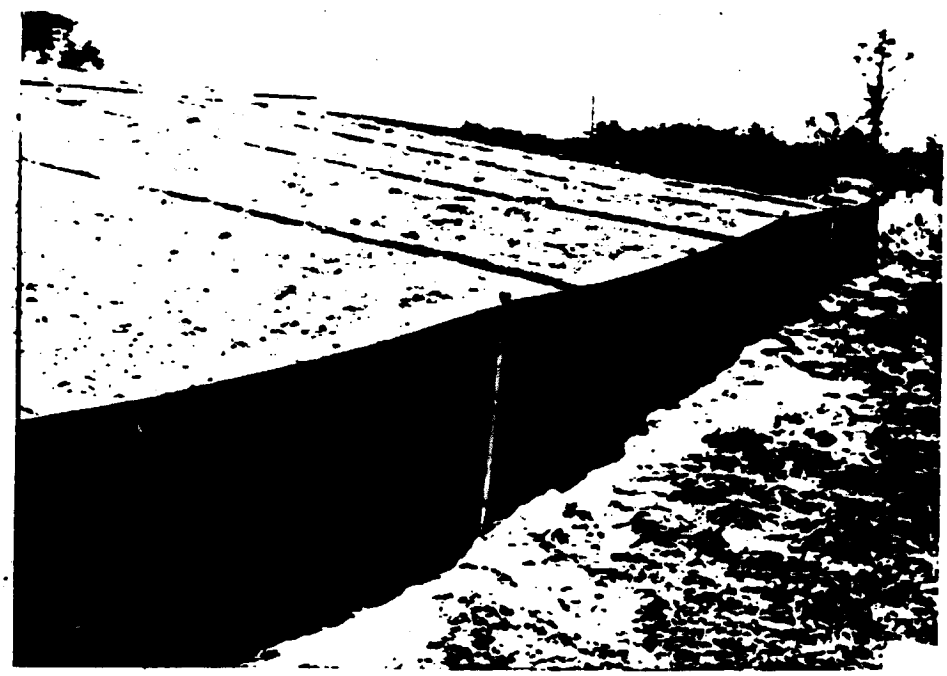
Purposes

1. To intercept and detain small amounts of sediment from disturbed areas during construction operations in order to prevent sediment from leaving the site.

2. To decrease the velocity of sheet flows and low-to-moderate level channel floods.

Conditions When Practice Applies

1. Below disturbed areas where erosion would occur in the form of sheet and rill erosion.



R0071343

2. Where the size of the drainage area is no more than 1/4 acre per 100 feet of silt fence length; the maximum slope length behind the barrier is 100 feet; and the maximum gradient behind the barrier is 50 percent (2:1).

3. In minor swales or ditch lines where the maximum contributing drainage area is no greater than 2 acres.

4. Under no circumstances should silt fences be constructed in live streams or in swales or ditch lines where flows are likely to exceed 1 cubic foot per second (cfs). See Design Criteria for further clarification.

Planning Considerations

Laboratory work at the Virginia Highway and Transportation Research Council (VH & TRC) has shown that silt fences can trap a much higher percentage of suspended sediments than can straw bales. Silt fences may be preferable to straw barriers in many cases. While the failure rate of silt fences is lower than that of straw barriers, there have been instances in which silt fences were improperly installed. The installation methods outlined here can improve performance.

Filter barriers are inexpensive structures composed of burlap or standard weight synthetic filter fabric stapled to wooden stakes. Flow rates through burlap filter barriers are slightly slower and filtering efficiency is significantly higher than for straw bale barriers (see Table 1.06a).

Table 1.06a

FLOW RATES AND FILTERING EFFICIENCIES OF VARIOUS SEDIMENT FILTER MATERIALS

Material	Flow Rate (gal./sq. ft./min.)	Filter Efficiency (%)
Straw	5.6	67
Burlap (10 oz. fabric)	2.4	84
Synthetic Fabric	0.3 (Avg.)	97 (Avg.)

Source: Va. Highway and Transportation Research Council

Silt fences composed of a wire support fence and an attached synthetic filter fabric slow the flow rate significantly but have a higher filtering efficiency than burlap. Both woven and non-woven synthetic fabrics are commercially available. The woven fabrics generally display higher strength than the non-woven fabrics. When tested under acid and alkaline water conditions, most of the woven fabrics increase in strength. There is a variety of reactions among the non-woven fabrics. The same is true of testing under extensive ultraviolet radiation. Permeability rates vary regardless of fabric type. While all of the fabrics demonstrate very high

filtering efficiencies for sandy sediments, there is considerable variation among both woven and non-woven fabrics when filtering the finer silt and clay particles.

Design Criteria

1. No formal design is required.

2. Filter barriers shall have an expected usable life of 3 months. They are applicable in ditch lines, around drop inlets, and at temporary locations where continuous construction changes the earth contour and runoff characteristics and where low or moderate flows (not exceeding 1 cfs) are expected.

3. Silt fences, because they have a much lower permeability than burlap filter barriers, have their applicability limited to situations in which only sheet or overland flows are expected. They normally cannot filter the volumes of water generated by channel flows, and many of the fabrics do not have sufficient structural strength to support the weight of water ponded behind the fence line. Their expected usable life is 6 months.

Construction Specifications

Materials

1. Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

PHYSICAL PROPERTY	TEST	REQUIREMENTS
Filtering Efficiency	VTM-51	75% (minimum)
Tensile Strength at 20% (max.) Elongation*	VTM-52	Extra Strength- 50 lbs./lin. in. (minimum) Standard Strength- 30 lbs./lin. in. (minimum)
Flow Rate	VTM-51	0.3 gal./sq. ft./min. (minimum)

*Requirements reduced by 50 percent after 6 months of installation.

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0° F to 120° F.

2. Burlap shall be 10 ounces per square yard fabric.

3. Posts for Silt Fences shall be either 4-inch diameter wood or 1.33 pounds per linear foot steel with a minimum length of 5 feet. Steel posts shall have projections for fastening wire to them.

R0071345

4. Stakes for Filter Barriers shall be 1" x 2" wood (preferred) or equivalent metal with a minimum length of 3 feet.

5. Wire fence reinforcement for silt fences using standard strength filter cloth shall be a minimum of 36 inches in height, a minimum of 14 gauge and shall have a maximum mesh spacing of 6 inches.

Filter Barrier: This sediment barrier may be constructed using burlap or standard strength synthetic filter fabric. It is designed for low or moderate flows not exceeding 1 cfs. See Plate 1.06a.

1. The height of a filter barrier shall be a minimum of 15 inches and shall not exceed 18 inches.

2. Burlap or standard strength synthetic filter fabric shall be purchased in a continuous roll and cut to the length of the barrier to avoid the use of joints (and thus improve the strength and efficiency of the barrier).

3. The stakes shall be spaced a maximum of 3 feet apart at the barrier location and driven securely into the ground (minimum of 8 inches).

4. A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of stakes and upslope from the barrier.

5. The filter material shall be stapled to the wooden stakes, and 8 inches of the fabric shall be extended into the trench. Heavy duty wire staples at least 1/2-inch long shall be used. Filter material shall not be stapled to existing trees.

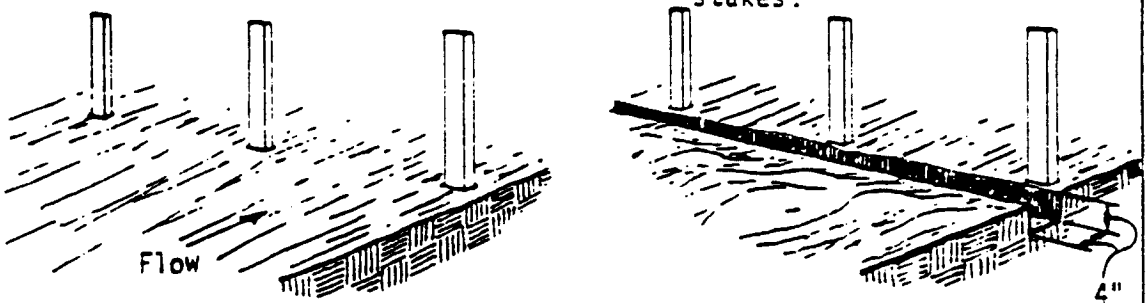
6. The trench shall be backfilled and the soil compacted over the filter material.

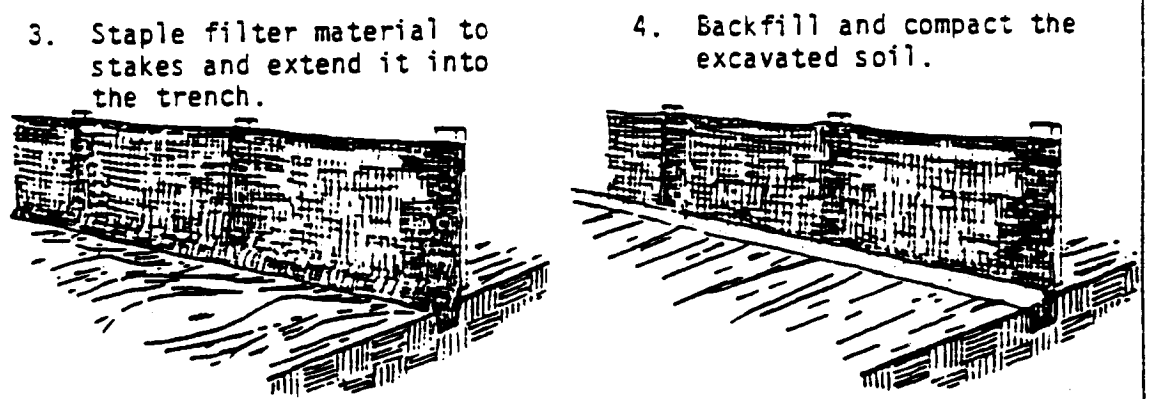
7. If a filter barrier is to be constructed across a ditch line or swale, the barrier shall be of sufficient length to eliminate end flow, and the plan configuration shall resemble an arc or horseshoe with the ends oriented upslope (Plate 1.06b).

8. Filter barriers shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

Silt Fence: This sediment barrier utilizes standard strength or extra strength synthetic filter fabrics. It is designed for situations in which only sheet or overland flows are expected. See Plate 1.06c.

1. The height of a silt fence shall not exceed 36 inches (higher fences may impound volumes of water sufficient to cause failure of the structure).

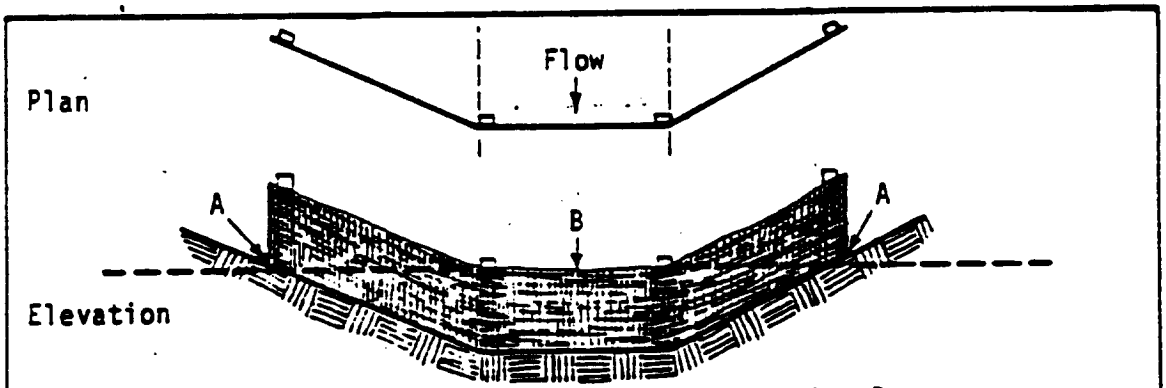




CONSTRUCTION OF A FILTER BARRIER

Source: Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 1.06a



Points A should be higher than point B

PROPER PLACEMENT OF A FILTER BARRIER IN A DRAINAGE WAY

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 1.06b

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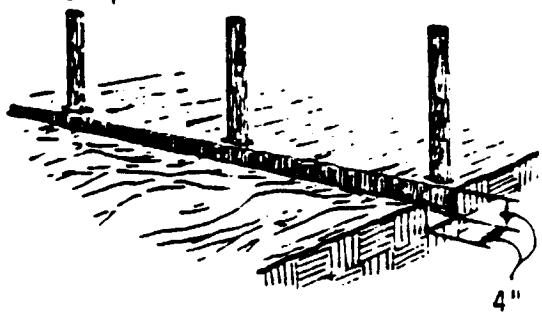
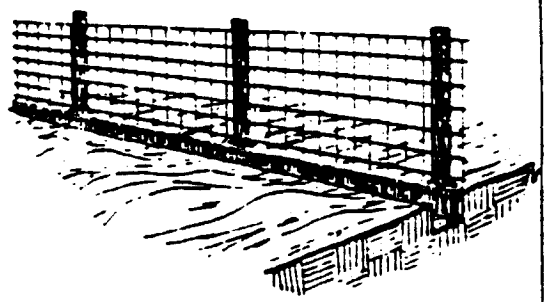
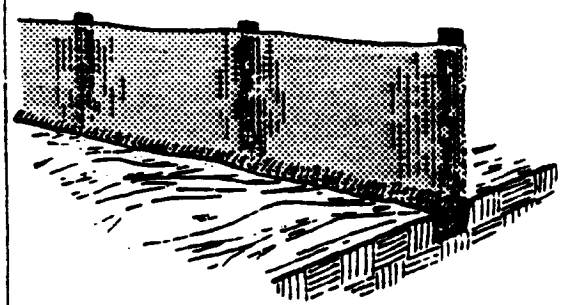
1. Set posts and excavate a 4"x4" trench upslope along the line of posts.



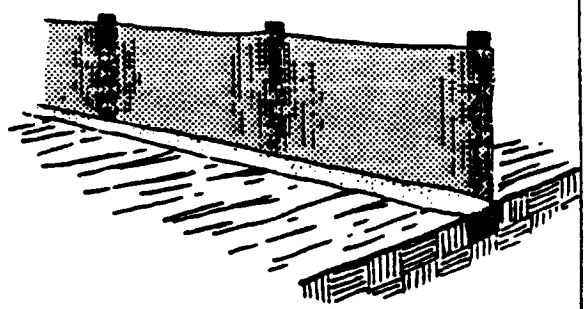
2. Staple wire fencing to the posts.



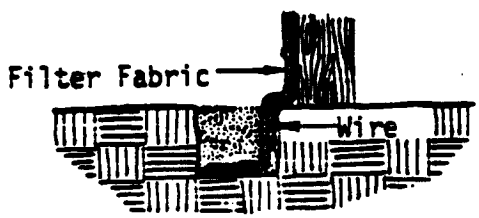
3. Attach the filter fabric to the wire fence and extend it into the trench.



4. Backfill and compact the excavated soil.



Extension of fabric and wire into the trench.



CONSTRUCTION OF A SILT FENCE

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Plate 1.06c

R0071348

2. The filter fabric shall be purchased in a continous roll cut to the length of the barrier to avoid the use of joints. When joints are necessary, filter cloth shall be spliced together only at a support post, with a minimum 6-inch overlap, and securely sealed.

3. Posts shall be spaced a maximum of 10 feet apart at the barrier location and driven securely into the ground (minimum of 12 inches). When extra strength fabric is used without the wire support fence, post spacing shall not exceed 6 feet.

4. A trench shall be excavated approximately 4 inches wide and 4 inches deep along the line of posts and upslope from the barrier.

5. When standard strength filter fabric is used, a wire mesh support fence fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least 1 inch long, tie wires or hog rings. The wire shall extend into the trench a minimum of 2 inches and shall not extend more than 36 inches above the original ground surface.

6. The Standard Strength filter fabric shall be stapled or wired to the fence, and 8 inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface.

7. When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item No. 6 applying.

8. The trench shall be backfilled and the soil compacted over the filter fabric.

9. Silt fences shall be removed when they have served their useful purpose, but not before the upslope area has been permanently stabilized.

Maintenance

1. Silt fences and filter barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. Any required repairs shall be made immediately.

2. Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still be necessary, the fabric shall be replaced promptly.

3. Sediment deposits should be removed after each storm event. They must be removed when deposits reach approximatley one-half the height of the barrier.

4. Any sediment deposits remaining in place after the silt fence or filter barrier is no longer required shall be dressed to conform with the existing grade, prepared and seeded.

ES BMP 1.07

BRUSH BARRIER

Definition

A temporary sediment barrier constructed at the perimeter of a disturbed area from the residue materials available from clearing and grubbing the site.

Purpose

To intercept and retain sediment from disturbed areas of limited extent, preventing sediment from leaving the site.

Conditions Where Practice Applies

Below disturbed areas subject to sheet and rill erosion, where enough residue material is available for construction of such a barrier.



Planning Considerations

Organic litter and spoil material from site clearing operations is usually burned or hauled away to be dumped elsewhere. Much of this material can be used effectively on the construction site itself. During clearing and grubbing operations, equipment can push or dump the mixture of limbs, small vegetation and root mat along with minor amounts of soil and rock into windrows along the toe of a slope where erosion and accelerated runoff are expected. Anchoring a filter fabric over the berm enhances the filtration ability of the barrier. Because brush barriers are fairly stable and composed of natural materials, maintenance requirements are small.

Design Criteria

A formal design is not required.

Construction Specifications

1. The height of a brush barrier shall be a minimum of 3 feet.

2. The width of a brush barrier shall be a minimum of 5 feet at its base. (The sizes of brush barriers may vary considerably based upon the amount of material available and the judgment of the design engineer.)

3. The barrier shall be constructed by piling brush, stone, root mat and other material from the clearing process into a mounded row on the contour.

If a filter fabric is used (Plate 1.07a):

4. The filter fabric shall be cut into lengths sufficient to lay across the barrier from its upslope base to just beyond its peak. Where joints are necessary, the fabric shall be spliced together with a minimum 6-inch overlap and securely sealed.

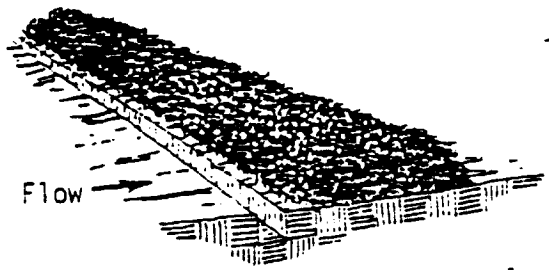
5. A trench shall be excavated 6 inches wide and 4 inches deep along the length of the barrier and immediately uphill from the barrier.

6. The lengths of filter fabric shall be draped across the width of the barrier with the uphill edge placed in the trench and the edges of adjacent pieces overlapping each other.

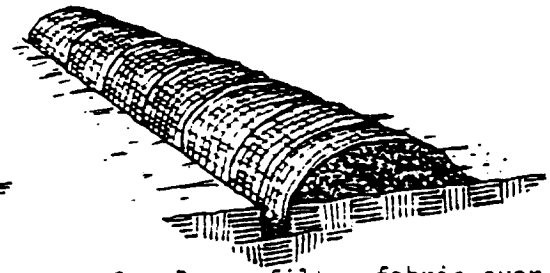
7. The filter fabric shall be secured in the trench with stakes set approximately 36 inches on center.

8. The trench shall be backfilled and the soil compacted over the filter fabric.

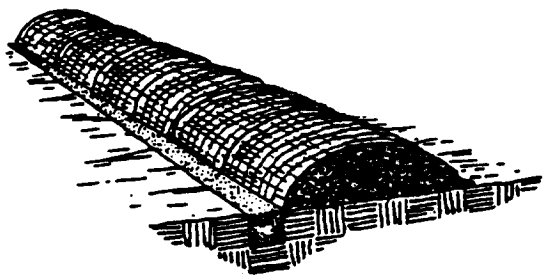
9. Set stakes into the ground along the downhill edge of the brush barrier, and anchor the fabric by tying twine from the fabric to the stakes.



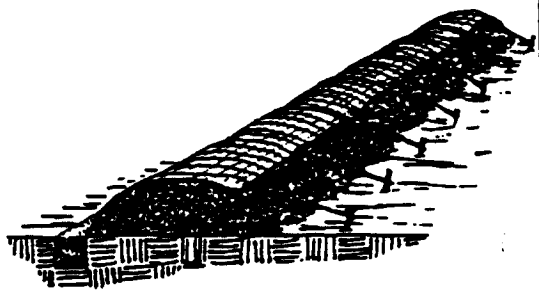
1. Excavate a 4" x 4" trench along the uphill edge of the brush barrier.



2. Drape filter fabric over the brush barrier and into the trench. Fabric should be secured in the trench with stakes set approximately 36" o.c.



3. Backfill and compact the excavated soil.



4. Set stakes along the downhill edge of the brush barrier, and anchor by tying twine from the fabric to the stakes.

CONSTRUCTION OF A BRUSH BARRIER
COVERED BY FILTER FABRIC

Plate 1.07a

Source: Adapted from Installation of Straw and Fabric Filter Barriers for Sediment Control, Sherwood and Wyant

Maintenance

1. Brush barriers shall be inspected after each rainfall and necessary repairs shall be made promptly.

2. Sediment deposits must be removed when they reach approximately one-half the height of the barrier.

ES BMP 1.08

STORM DRAIN INLET PROTECTION

Definition

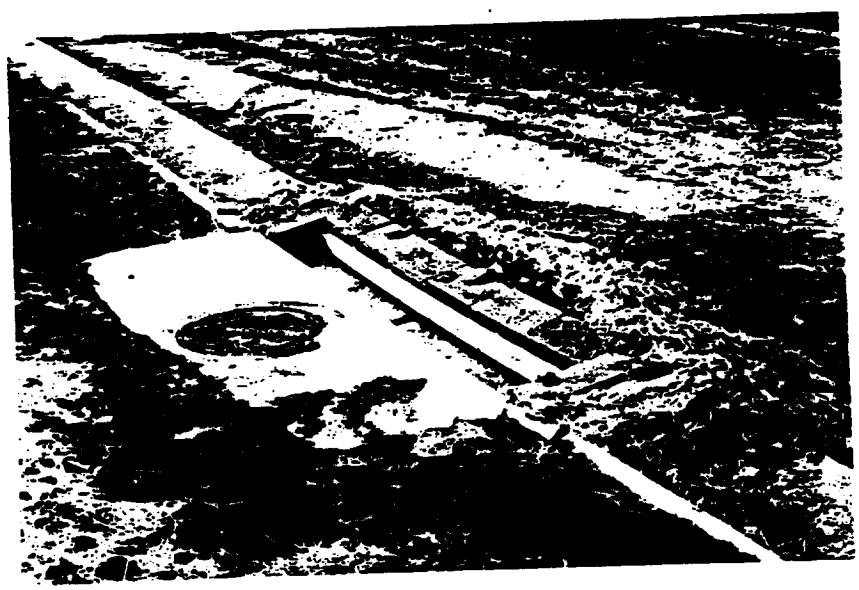
A sediment filter or an excavated impounding area around a storm drain drop inlet or curb inlet.

Purpose

To prevent sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area.

Condition Where Practice Applies

Where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. Different types of structures are applicable to different conditions (see Plates 1.08a through 1.08h).



R0071353

Planning Considerations

Storm sewers which are made operational before their drainage area is stabilized can convey large amounts of sediment to natural drainageways. In case of extreme sediment loading, the storm sewer itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets.

This practice contains several types of inlet filters and traps which have different applications dependent upon site conditions and type of inlet. Other innovative techniques for accomplishing the same purpose are encouraged, but only after specific plans and details are submitted to and approved by the stormwater permitting agency.

Note that these various inlet protection devices are for drainage areas of less than one acre. Runoff from large disturbed areas should be routed through a TEMPORARY SEDIMENT TRAP (ES BMP 1.25).

Design Criteria

1. The drainage area shall be no greater than 1 acre.

2. The inlet protection device shall be constructed in such a manner that will facilitate cleanout and disposal of trapped sediment and minimize interference with construction activities.

3. The inlet protection devices shall be constructed in such a manner that any resultant ponding or stormwater will not cause excessive inconvenience or damage to adjacent areas or structures.

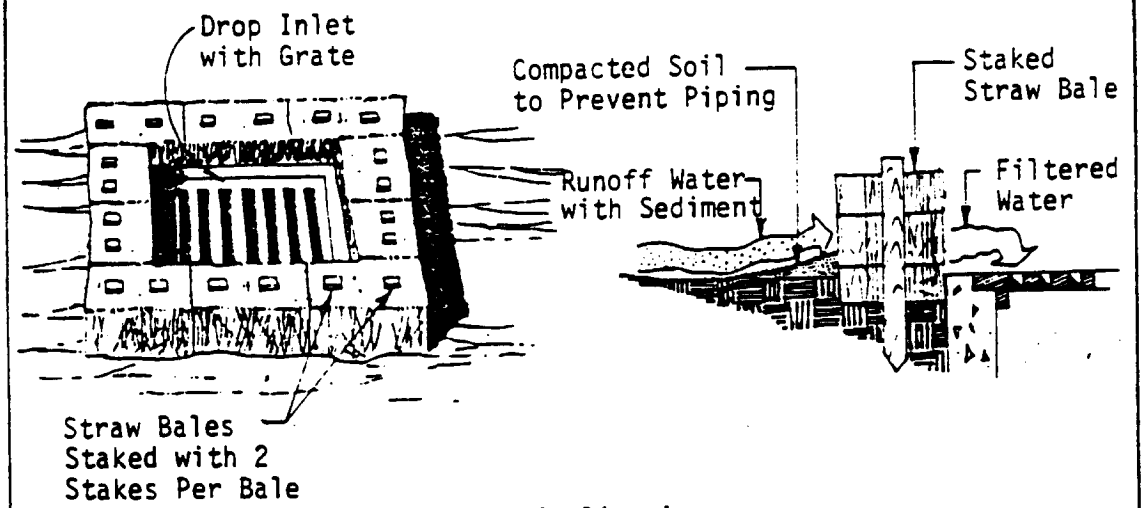
4. Design criteria more specific to each particular inlet protection device will be found on Plates 1.08a-h.

Construction Specifications

1. **STRAW BALE DROP INLET STRUCTURE**

   a. Bales shall be either wire-bound or string-tied with the bindings oriented around the sides rather than over and under the bales.
   b. Bales shall be placed lengthwise in a single row surrounding the inlet, with the ends of adjacent bales pressed together.
   c. The filter barrier shall be entrenched and backfilled. A trench shall be excavated around the inlet the width of a bale to a minimum depth of 4 inches. After the bales are staked, the excavated soil shall be backfilled and compacted against the filter barrier.

d. Each bale shall be securely anchored and held in place by at least two stakes or rebars driven through the bale.
e. Loose straw should be wedged between bales to prevent water from entering between bales.



Specific Application

This method of inlet protection is applicable where the inlet drains a relatively flat area (slopes no greater than 5 percent) where sheet or overland flows (not exceeding 0.5 cfs) are typical. The method shall not apply to inlets receiving concentrated flows, such as in street or highway medians.

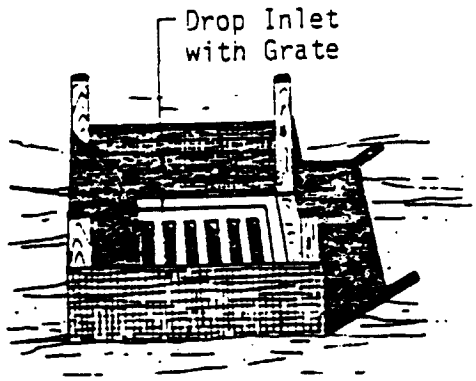
STRAW BALE DROP INLET SEDIMENT FILTER

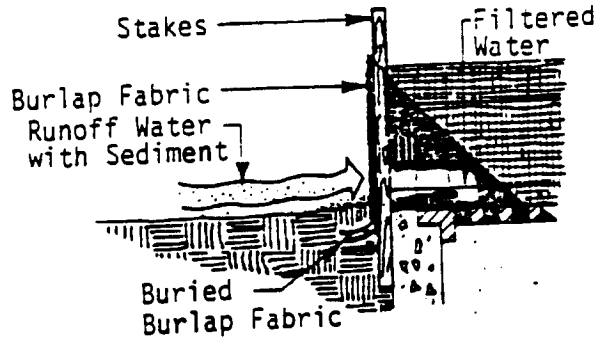
Source: Michigan Soil Erosion and Sedimentation Control Guidebook, 1975

Plate 1.08a

2. **BURLAP DROP INLET SEDIMENT FILTER**

a. Burlap shall be 10 ounce per square yard fabric and shall be cut from a continuous roll to avoid joints.
b. Stakes shall be 1" x 2" wood (preferred) or equivalent metal with a minimum length of 3 feet.
c. Staples shall be of heavy duty wire at least 1/2-inch long.
d. Stakes shall be spaced around the perimeter of the inlet a maximum of 3 feet apart and securely driven into the ground (minimum of 8 inches).
e. A trench shall be excavated approximately 4 inches wide and 4 inches deep around the outside perimeter of the stakes.
f. The burlap shall be stapled to the wooden stakes, and 8 inches of the fabric shall be extended into the trench. The height of the filter barrier shall be a minimum of 15 inches and shall not exceed 18 inches (Plate 1.08b).
g. The trench shall be backfilled and the soil compacted over the burlap.





Specific Application

This method of inlet protection is applicable where the inlet drains a relatively flat area (slopes no greater than 5 percent) where sheet or overland flows (not exceeding 0.5 cfs) are typical. The method shall not apply to inlets receiving concentrated flows, such as in street or highway medians.

BURLAP DROP INLET SEDIMENT FILTER

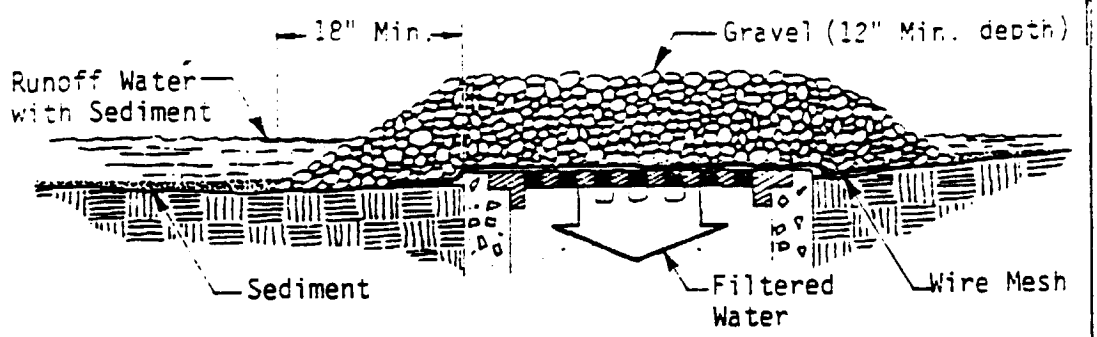
Plate 1.08b

Source: Va SWCC

3. **GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER**

   a. Wire mesh shall be laid over the drop inlet so that the wire extends a minimum of 1 foot beyond each side of the inlet structure. Hardware cloth or comparable wire mesh with 1/2-inch openings shall be used. If more than one strip of mesh is necessary, the strips shall be overlapped.
   b. FDOT No. 1 Coarse Aggregate shall be placed over the wire mesh as indicated on Plate 1.08c. The depth of stone shall be at least 12 inches over the entire inlet opening. The stone shall extend beyond the inlet opening at least 18 inches on all sides.
   c. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stones must be pulled away from the inlet, cleaned and replaced.

NOTE: This filtering device has no overflow mechanism. Therefore, ponding is likely especially if sediment is not removed regularly. This type of device must never be used where overflow may endanger an exposed fill slope. Consideration should also be given to the possible effects of ponding on traffic movement, nearby structures, working areas, adjacent property, etc.



Specific Application

This method of inlet protection is applicable where heavy concentrated flows are expected, but not where ponding around the structure might cause excessive inconvenience or damage to adjacent structures and unprotected areas.

GRAVEL AND WIRE MESH DROP INLET SEDIMENT FILTER

Source: Va SWCC

Plate 1.08c

4. **BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER**

   a. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, with the ends of adjacent blocks abutting. The height of the barrier can be varied, depending on design needs, by stacking combinations of 4-inch, 8-inch and 12-inch wide blocks. The barrier of blocks shall be at least 12 inches high and no greater than 24 inches high.
   b. Wire mesh shall be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Hardware cloth or comparable wire mesh with 1/2-inch openings shall be used.
   c. Stone shall be piled against the wire to the top of the block barrier, as shown in Plate 1.08d. FDOT No. 1 Coarse Aggregate shall be used.
   d. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the blocks, cleaned and replaced.

5. **EXCAVATED DROP INLET SEDIMENT TRAP**

   a. The excavated trap shall be sized to provide a minimum storage capacity calculated at the rate of 67 cubic yards for 1 acre of drainage area. A trap shall be no less than 1 foot nor more than 2 feet deep measured from the top of the inlet structure. Side slopes shall not be steeper than 3:1 (Plate 1.08e).
   b. The slope of the basin may vary to fit the drainage area and terrain. Observations must be made to check trap efficiency and modifications shall be made as necessary to insure satisfactory trapping of sediment. Where an inlet is located so as to receive concentrated flows, such as in a highway median, it is recommended that the basin have a rectangular shape in 2:1 ratio, with the length oriented in the direction of the flow.

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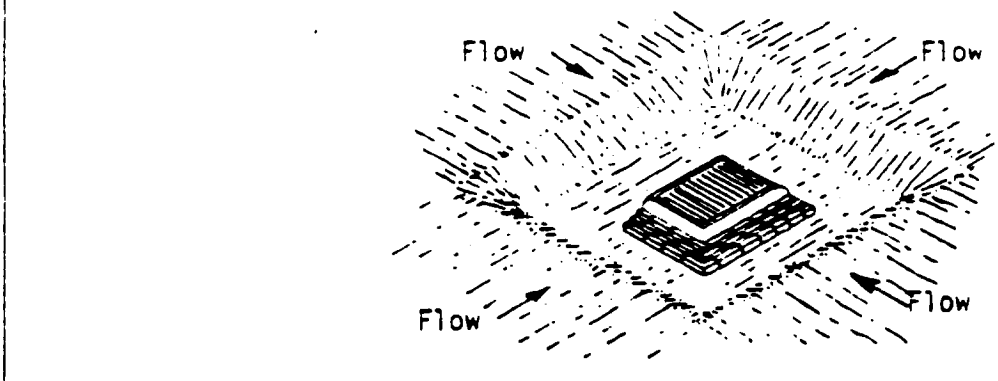

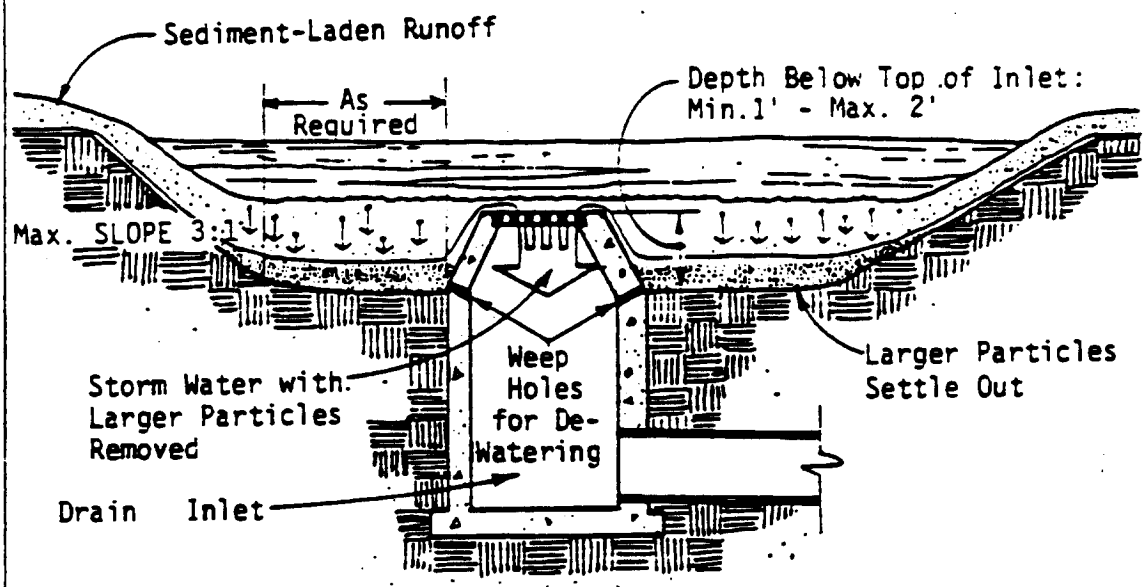

Specific Application

This method of inlet protection is applicable where heavy flows are expected and where an overflow capability and ease of maintenance are desirable.

EXCAVATED DROP INLET SEDIMENT TRAP

Source: Michigan Soil Erosion and Sedimentation Control Guidebook, 1975, and USDA-SCS

Plate 1.08e

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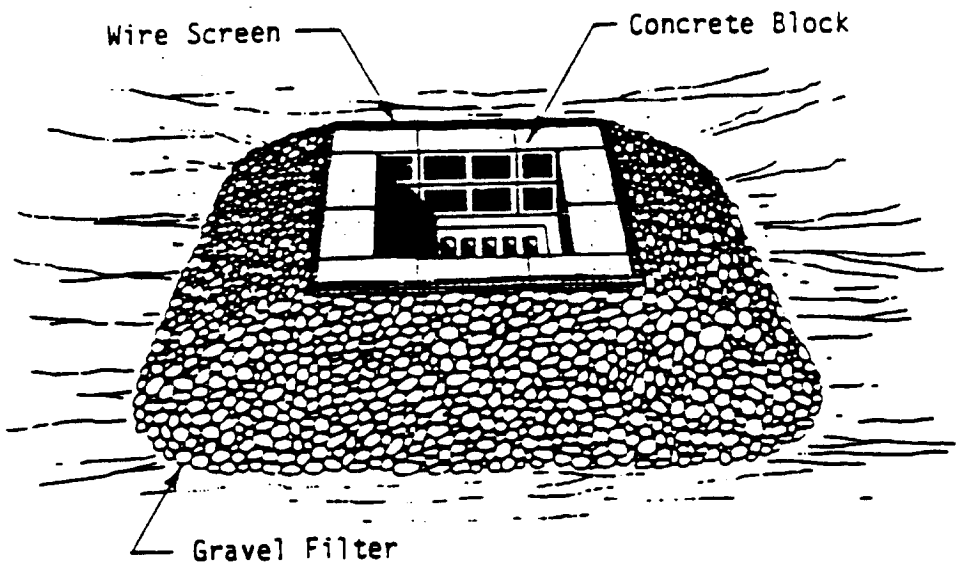
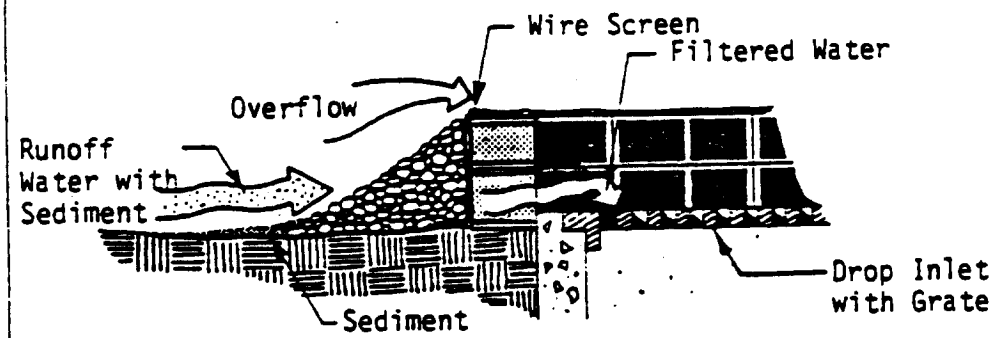




Specific Application

This method of inlet protection is applicable where heavy flows are expected and where an overflow capacity is necessary to prevent excessive ponding around the structure.

BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER

Source: Va SWCC

Plate 1.08d

R0071359

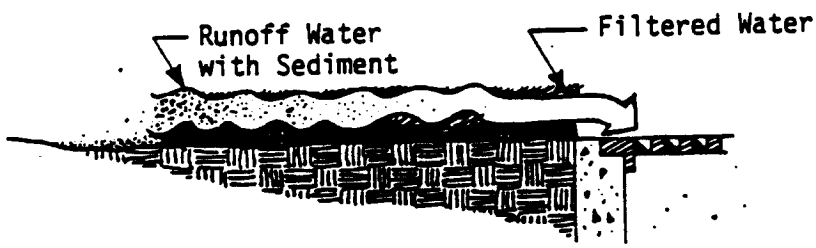
c. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in a manner such that it will not erode.

6. SOD DROP INLET SEDIMENT FILTER

a. Soil shall be prepared and sod installed according to the specifications in ES BMP 1.67 entitled SODDING.
b. Sod shall be placed to form a turf map covering the soil for a distance of 4 feet from each side of the inlet structure, as illustrated in Plate 1.08f.



Four 1-foot Wide Strips of Sod on Each Side of the Drop Inlet



Specific Application

This method of inlet protection is applicable only at the time of permanent seeding, to protect the inlet from sediment and mulch materials until permanent vegetation has become established.

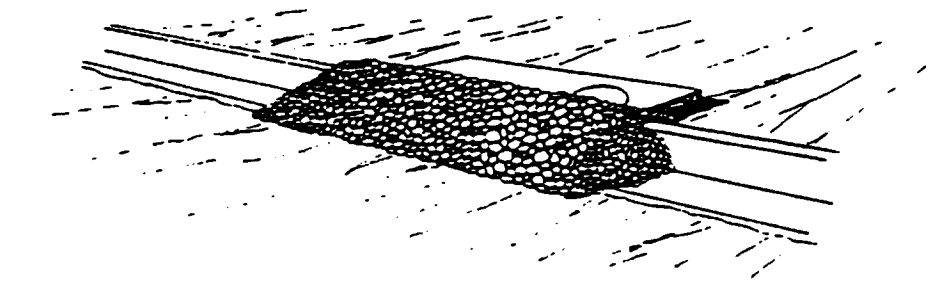
SOD DROP INLET SEDIMENT FILTER

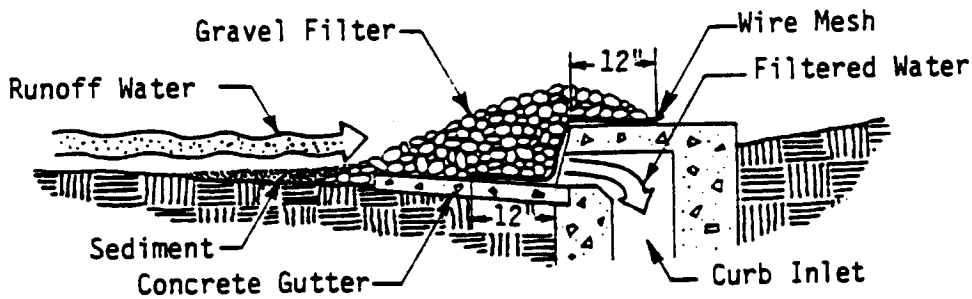
Plate 1.08f

Source: Va SWCC

a. Hardware cloth or comparable wire mesh with 1/2-inch openings shall be placed over the curb inlet opening so that at least 12 inches of wire extends across the inlet cover and at least 12 inches of wire extends across the concrete gutter from the inlet opening, as illustrated in Plate 1.08g.

b. Stone shall be piled against the wire so as to anchor it against the gutter and inlet cover and to cover the inlet opening completely. FDOT No. 1 Coarse Aggregate shall be used.
c. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the block, cleaned and replaced.





Specific Application

This method of inlet protection is applicable at curb inlets where ponding in front of the structure is not likely to cause inconvenience or damage to adjacent structures and unprotected areas.

GRAVEL CURB INLET SEDIMENT FILTER

Source: Va SWCC

Plate 1.08g

8. **BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER**

a. Two concrete blocks shall be placed on their sides abutting the curb at either side of the inlet opening.
b. A 2-inch by 4-inch stud shall be cut and placed through the outer holes of each spacer block to help keep the front blocks in place.
c. Concrete blocks shall be placed on their sides across the front of the inlet and abutting the spacer blocks as illustrated in Plate 1.08h.
d. Wire mesh shall be placed over the outside vertical face (webbing) of the concrete blocks to prevent stone from being washed through the holes in the blocks. Chicken wire or hardware cloth with 1/2-inch openings shall be used.
e. FDOT No. 1 Coarse Aggregate shall be piled against the wire to the top of the barrier as shown in Plate 1.08h.

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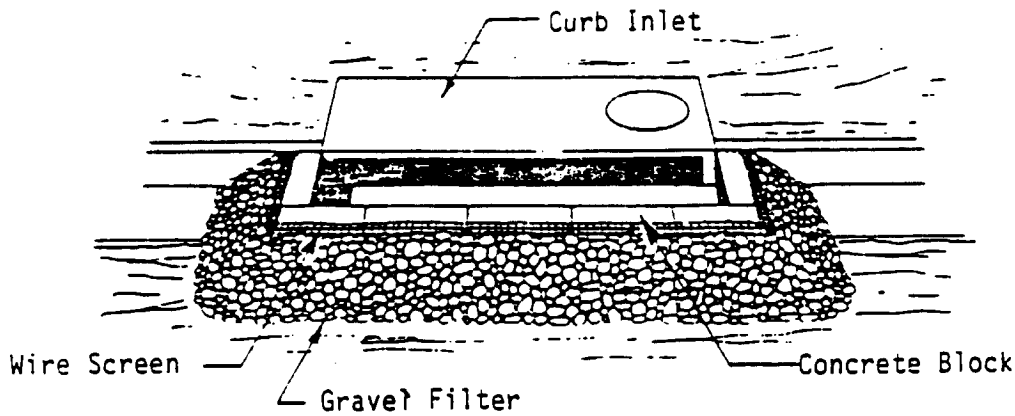
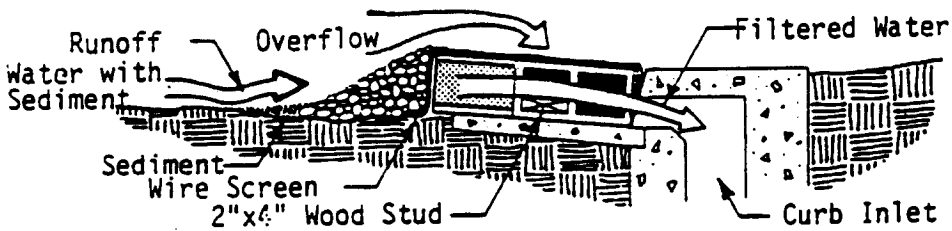
f. If the stone filter becomes clogged with sediment so that it no longer adequately performs its function, the stone must be pulled away from the block, cleaned and replaced.





Specific Application

This method of inlet protection is applicable at curb inlets where an overflow capability is necessary to prevent excessive ponding in front of the structure.

BLOCK AND GRAVEL CURB INLET SEDIMENT FILTER

Source: Va SWCC

Plate 1.08h

Maintenance

1. The structure shall be inspected after each rain and repairs made as needed.

2. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.

3. Structures shall be removed and the area stabilized when the remaining drainage area has been properly stabilized.

ES BMP 1.15

TEMPORARY DIVERSION DIKE

Definition

A temporary ridge of compacted soil located at the top or base of a sloping disturbed area.

Purposes

1. To divert storm runoff from higher drainage areas away from unprotected slopes to a stabilized outlet;

or

2. To divert sediment-laden runoff from a disturbed area to a sediment trapping facility.

Condition Where Practice Applies

Wherever stormwater runoff must be temporarily diverted to protect disturbed slopes or retain sediments on site during construction. These structures generally have a life expectancy of 18 months or less.



Planning Considerations

A temporary diversion dike is intended to divert overland sheet flow to a stabilized outlet or a sediment trapping facility during establishment of permanent stabilization on sloping, disturbed areas. When used at the top of a slope, the structure protects exposed slopes by keeping upland runoff away. When used at the base of a slope, the structure protects adjacent and downstream areas by diverting sediment-laden runoff to a sediment trapping facility.

If the dike is going to remain in place for longer than 30 days, it is very important that it be established with temporary or permanent vegetation. The slope behind the dike is also an important consideration. The dike must have a positive grade to assure drainage, but if the slope is too great, precautions must be taken to prevent erosion due to high velocity flow behind the dike.

This practice is considered an economical one because it uses material available on the site and can usually be constructed with equipment needed for site grading. The useful life of the practice can be extended by stabilizing the dike with vegetation.

As specified herein, this practice is intended to be temporary. However, with more stringent design criteria, it can be made permanent in accordance with DIVERSIONS (ES BMP 1.18).

Design Criteria

No formal design is required. The following criteria shall be met:

Drainage Area

The maximum allowable drainage area is 5 acres.

Dimensions

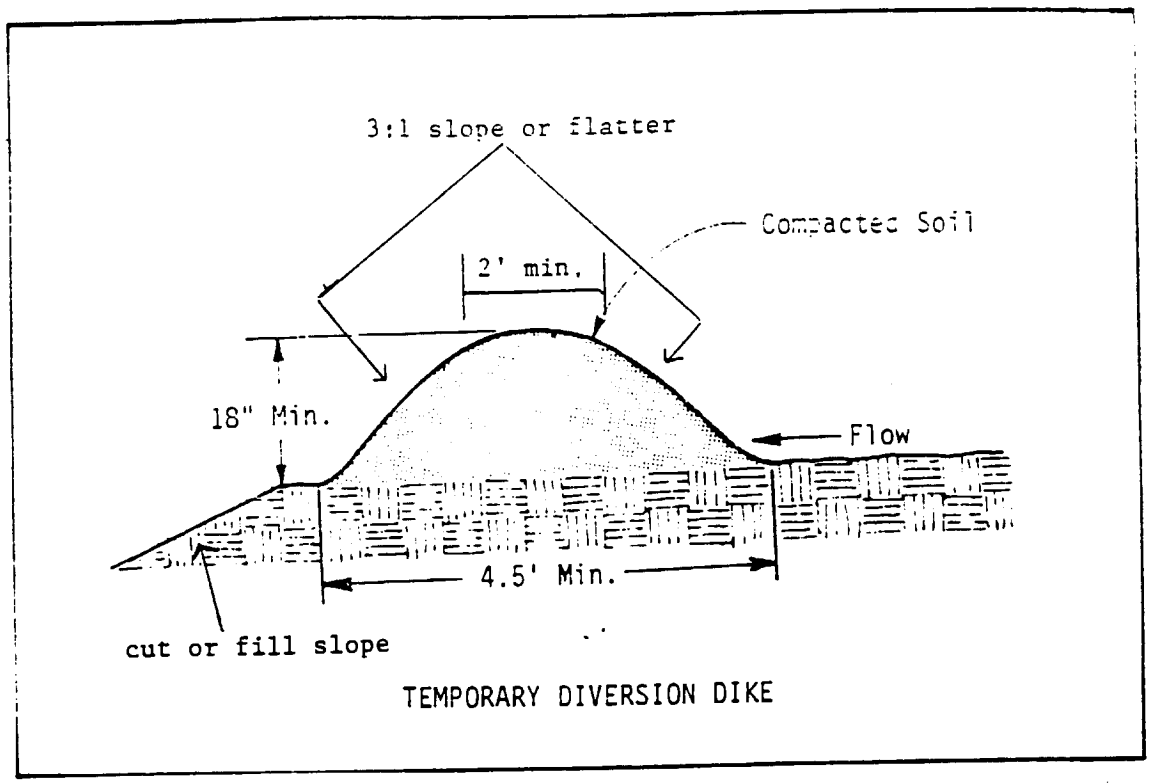
The minimum allowable height measured from the upslope side of the dike is 18 inches. Top width shall be a minimum of 2 feet with a minimum base width of 4.5 feet. (See Plate 1.15a)

Side Slopes

3:1 or flatter.

Grade

The channel behind the dike shall have a positive grade to a stabilized outlet. If the channel slope is less than or equal to 2%, no stabilization is usually required. If the slope is greater than 2%, the channel shall be stabilized in accordance with ES BMP 1.35 (STORMWATER CONVEYANCE CHANNEL).



TEMPORARY DIVERSION DIKE

Source: Va SWCC

Plate 1.15a

Outlet

1. The diverted runoff, if free of sediment, must be released through a stabilized outlet or channel.

2. Sediment-laden runoff must be diverted and released through a sediment trapping facility.

Construction Specifications

1. Whenever feasible, the dike should be built before construction begins on the project.

2. The dike should be adequately compacted to prevent failure.

3. Temporary or permanent seeding and mulch shall be applied to the dike within 15 days of construction.

4. The dike should be located to minimize damages by construction operations and traffic.

Maintenance

The measure shall be inspected after every storm and repairs made to the dike, flow channel and outlet, as necessary. Approximately once every week, whether a storm has occurred or not, the measure shall be inspected and repairs made if needed. Damages caused by construction traffic or other activity must be repaired before the end of each working day.

ES BMP 1.16

TEMPORARY FILL DIVERSION

Definition

A channel with a supporting ridge on the lower side cut along the top of an active earth fill.

Purpose

To divert storm runoff away from the unprotected slope of the fill to a stabilized outlet or sediment trapping facility.

Conditions Where Practice Applies

Where the drainage area at the top of an active earth fill slopes toward the exposed slope and where continuous fill operations make the use of a DIVERSION (ES BMP 1.18) unfeasible. This temporary structure should remain in place for less than one week.



R0071367

Planning Considerations

One important principle of erosion and sediment control is to keep stormwater runoff away from exposed slopes. This is often accomplished by installing a dike, diversion or paved ditch at the top of a slope to carry the runoff away from the slope to a stabilized outlet or downdrain. In general, these measures are installed after the final grade has been reached. On cuts, the measures may be installed at the beginning since the work proceeds from the top and the measures have little chance of being covered or damaged. On fills, the work proceeds from the bottom to the top and the elevation changes daily. It is therefore not feasible to construct a compacted dike or permanent diversion which may be covered by the next day's activity.

The temporary fill diversion is intended to provide some slope protection on a daily basis until final elevations are reached and a more permanent measure can be constructed. This practice can be constructed by the use of a motor grader or one of the smaller dozers. To shape the diversion, the piece of machinery used may run near the edge of the fill with its blade tilted to form the channel as described in Plate 1.16a. This work would be done at the end of the working day and provide a channel with a berm on the lower side to protect the slope. Wherever possible, the temporary diversion should be sloped to direct water to a stabilized outlet. If the runoff is diverted over the fill itself, the practice may cause more problems than it solves by concentrating water at a single point.

Good timing is essential to fill construction. The filling operation should be completed as quickly as possible and the permanent slope protection measures and slope stabilization measures installed as soon after completion as possible. With quick and proper construction, the developer or contractor will save both time and money in building, repairing and stabilizing the fill area. The longer the time period for construction and stabilization, the more prone the fill operation is to damages by erosion. Repairing the damages adds additional time and expense to the project.

Design Criteria

No formal design is required. The following criteria shall be met:

Drainage Area

The maximum allowable drainage area is 5 acres.

Height

The minimum height of the supporting ridge shall be 9 inches. (See Plate 1.16a).

Grade

The channel shall have a positive grade to a stabilized outlet.

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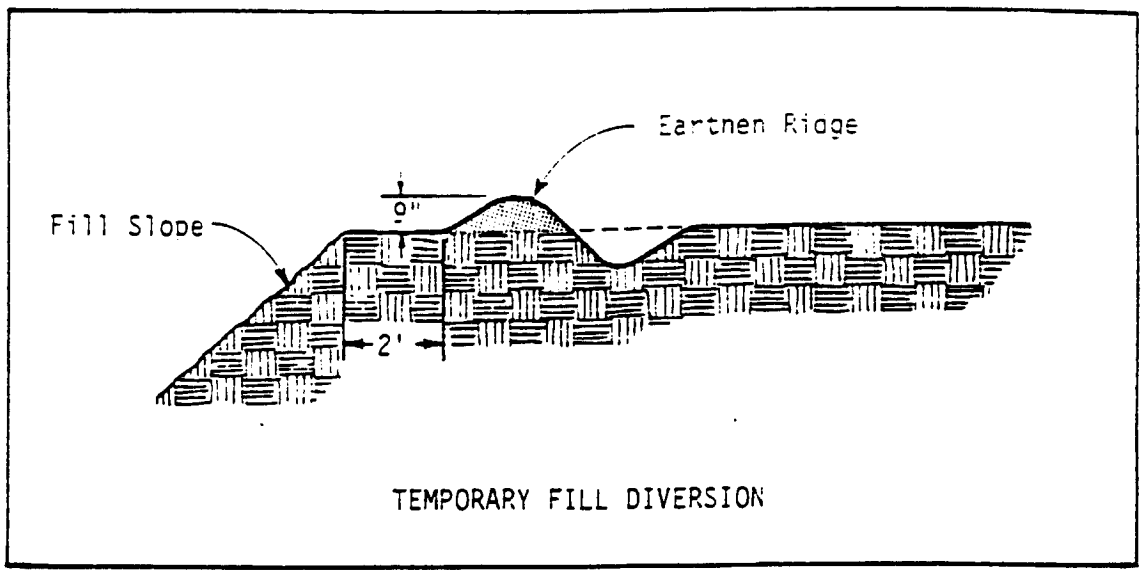

TEMPORARY FILL DIVERSION

Source: Va SWCC

Plate 1.16a

Outlet

The diverted runoff should be released through a stabilized outlet, slope drain or sediment trapping measure.

Construction Specifications

1. The diversion shall be constructed at the top of the fill at the end of each work day as needed.

2. The diversion shall be located at least 2 feet inside the top edge of the fill. (See Plate 1.16a).

3. The supporting ridge of the lower side shall be constructed with a uniform height along its entire length.

Maintenance

Since the practice is temporary and under most situations will be covered the next work day, the maintenance required should be low. If the practice is to remain in use for more than one day, an inspection will be made at the end of each work day and repairs made to the measure if needed. The contractor should avoid the placement of any material over the structure while it is in use. Construction traffic should not be permitted to cross the diversion.

R0071369

ES BMP 1.17

TEMPORARY
RIGHT-OF-WAY DIVERSION

Definition

A ridge of compacted soil or loose rock or gravel constructed across disturbed rights-of-way and similar sloping areas.

Purpose

To shorten the flow length within a long sloping right-of-way, thereby reducing the erosion potential by diverting storm runoff to a stabilized outlet or sediment trapping device.

Conditions Where Practice Applies

Generally, earthen diversions are applicable where there will be little or no construction traffic within the right-of-way. Gravel structures are more applicable to roads and other rights-of-way which accommodate vehicular traffic.



R0071370

Planning Considerations

Construction of utility lines and roads often requires the clearing of long strips of right-of-way over sloping terrain. Tne volume and velocity of stormwater runoff tend to increase in these cleared strips and the potential for erosion is much greater since the vegetative cover is diminished or removed. To compensate for the loss of vegetation, it is usually a good practice to break up the flow length within tne cleared strip so that runoff does not have a chance to concentrate and cause erosion. At proper spacing intervals, Temporary Right-of-Way Diversions can significantly reduce the amount of erosion which will occur until the area is permanently stabilized.

Design Criteria

No formal design is required. The following criteria shall be met:

Drainage Area - Less than 5 acres (for larger drainage areas use a DIVERSION, ES BMP 1.18).

Dimensions

The minimum allowable height measured from the upslope side of the diversion is 18 inches. The minimum top width shall be 2 feet and the base width minimum is 6 feet.

Side Slopes

3:1 or flatter to allow the passage of construction traffic. (See Plate 1.17a).

Width

The measure should be constructed completely across the disturbed portion of the right-of-way.

Spacing

The following table will be used to determine the spacing of right-of-way diversions:

% Slope	Spacing (ft.)
Less than 5%	300
Between 5% and 10%	200
Greater than 10%	100

Grade

Positive drainage, with less than 2% slope, should be provided to a stabilized outlet or sediment trapping facility.

Outlet

Interceptor dikes must have an outlet which is not subject to erosion.

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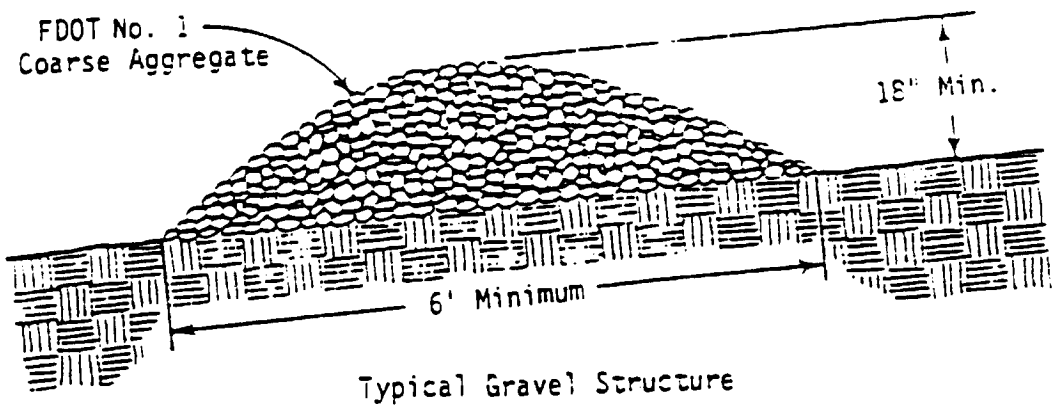
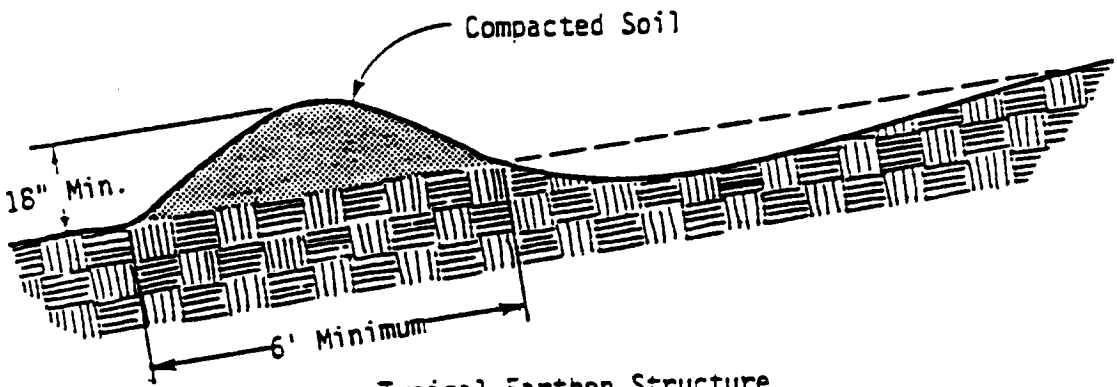


Typical Gravel Structure



Typical Earthen Structure

TEMPORARY RIGHT-OF-WAY DIVERSIONS

Plate 1.17a

Source: Va SWCC

R0071372

The on-site location may need to be adjusted to meet field conditions in order to utilize the most suitable outlet. Concentrated flows should spread over the widest possible area after release. Flows with high sediment concentrations should pass through a sediment trapping measure.

Construction Specifications

1. The diversion shall be installed as soon as the right-of-way has been cleared and/or graded.

2. All earthen diversions shall be machine- or hand-compacted in 8-inch lifts.

3. The outlet of the diversion shall be located on an undisturbed and stabilized area when at all possible. The field location should be adjusted as needed to utilize a stabilized outlet. Sediment laden flows shall be conveyed to a sediment trapping device.

4. Earthen diversions which will not be subject to construction traffic should be stabilized in accordance with TEMPORARY SEEDING (ES BMP 1.65).

Maintenance

The practice shall be inspected after every rainfall and repairs made if necessary. Approximately once every week, whether a storm has occurred or not, the measure shall be inspected and repairs made if needed. Diversions which are subject to damage by vehicular traffic should be re-shaped at the end of each working day.

R0071373

ES BMP 1.18

DIVERSION

Definition

A channel constructed across a slope with a supporting ridge on the lower side.

Purpose

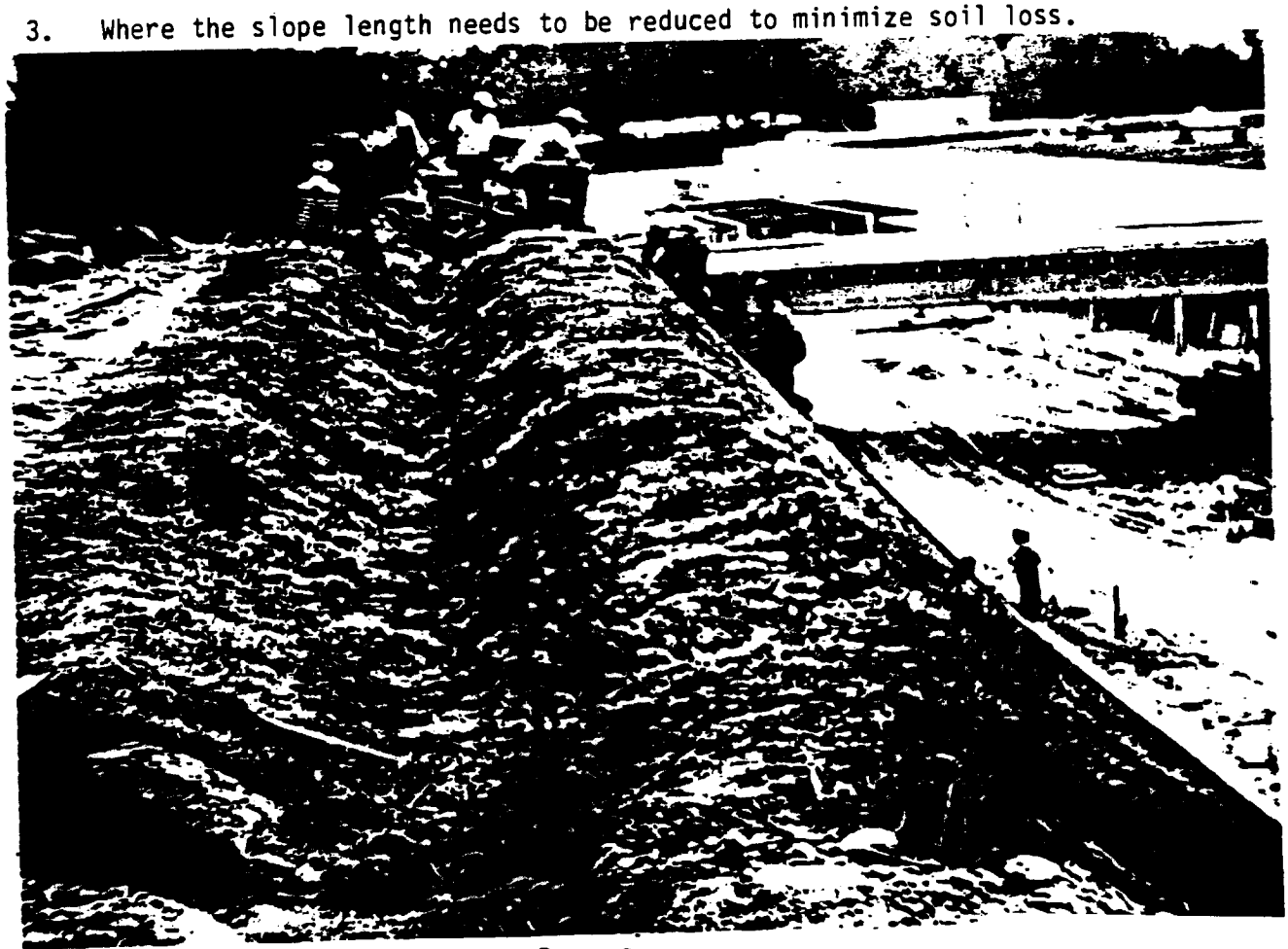
To reduce slope length and to intercept and divert stormwater runoff to stabilized outlets at non-erosive velocities.

Conditions Where Practice Applies

1. Where runoff from higher areas may damage property, cause erosion, or interfere with the establishment of vegetation on lower areas.

2. Where surface and/or shallow subsurface flow is damaging upland slopes.

3. Where the slope length needs to be reduced to minimize soil loss.



R0071374

4. Diversions are applicable only below stabilized or protected areas. They should not be used below high sediment producing areas unless land treatment practices or structural measures, designed to prevent damaging accumulations of sediment in the channels, are installed with or before the diversions.

5. Diversions should not be placed on slopes greater than fifteen percent.

Planning Considerations

Diversions can be useful tools for managing surface water flows and preventing soil erosion. On moderately sloping areas, they may be placed at intervals to trap and divert sheet flow before it has a chance to concentrate and cause rill and gully erosion. They may be placed at the top of cut or fill slopes to keep runoff from upland drainage areas off the slope. They can also be used to protect structures, parking lots, adjacent properties, and other special areas from flooding.

Diversions are preferable to other types of man-made stormwater conveyance systems because they more closely simulate natural flow patterns and characteristics. Flow velocities are generally kept to a minimum. When properly coordinated into the landscape design of a site, diversions can be visually pleasing as well as functional.

As with any earthen structure, it is very important to establish adequate vegetation as soon as possible after installation. It is equally important to stabilize the drainage area above the diversion so that sediment will not enter and accumulate in the diversion channel.

Diversions should be constructed before clearing and grading operations begin. If used to protect a flat, exposed area, a diversion might be constructed as a dike or berm. Berms made of gravel or story can be crossed by construction equipment.

Design Criteria

Location

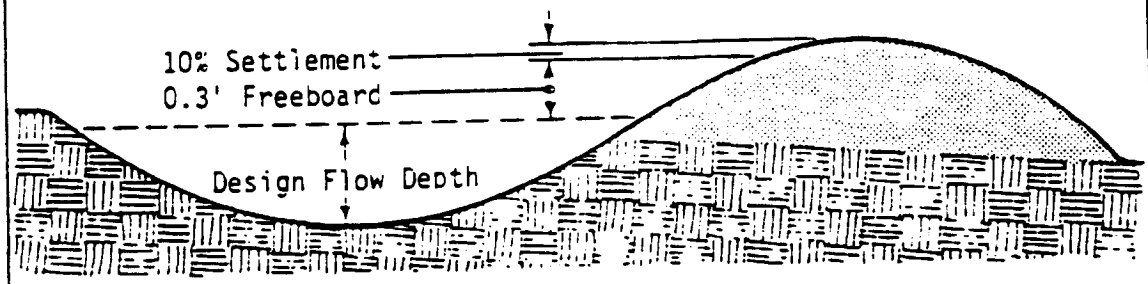
Diversion location shall be determined by considering outlet conditions, topography, land use, soil type, length of slope, seepage planes (where seepage is a problem) and the development layout.

Capacity

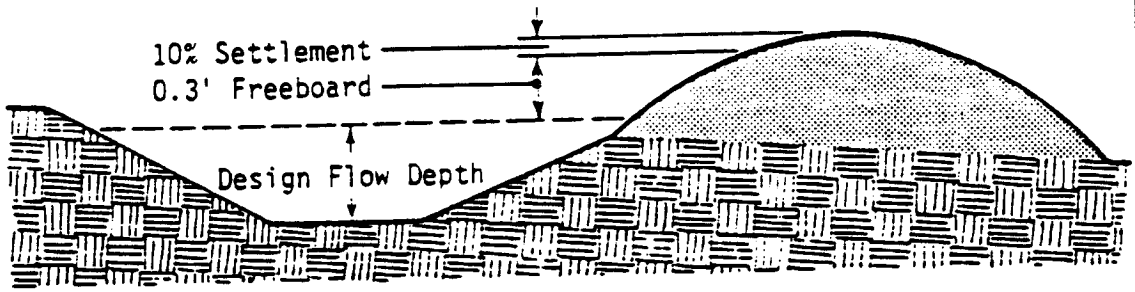
1. The diversion channel must have a minimum capacity to carry the runoff expected from a 10-year frequency storm with a freeboard of at least 0.3 foot. (Plate 1.18a).

2. Diversions designed to protect homes, schools, industrial buildings, roads, parking lots, and comparable high-risk areas, and those designed to function in connection with other structures, shall have sufficient capacity to carry peak runoff expected from a storm frequency consistent with the hazard involved.

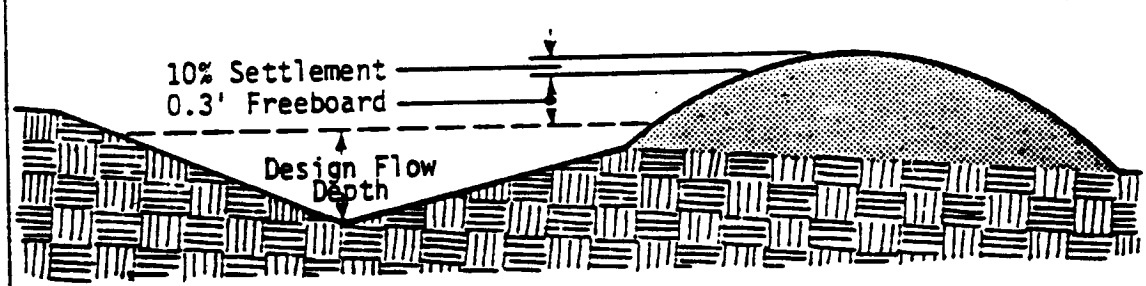
R0071375



Typical Parabolic Diversion



Typical Trapezoidal Diversion



Typical Vee-Shaped Diversion

DIVERSIONS

Source: Va SWCC

Plate 1.18a

R0071376

3. Peak rates of runoff used in determining the capacity requirements shall be as outlined in Chapter 5 of this manual or by other accepted methods.

Channel Design

The diversion channel may be parabolic, trapezoidal or Vee-shaped and shall be designed and constructed according to ES BMP 1.35 (STORMWATER CONVEYANCE CHANNELS).

Ridge Design

The supporting ridge cross-section shall meet the following criteria (Plate 1.18a).

1. The side slopes shall be no steeper than 2:1 and shall be flat enough to insure ease of maintenance of the structure and its protective vegetative cover.

2. The width at the design water elevation shall be a minimum of 4 feet.

3. The minimum freeboard shall be 0.3 foot.

4. The design shall include a 10 percent settlement factor.

Outlet

Diversions shall be stabilized outlets which will convey concentrated runoff without erosion. Acceptable outlets include STORMWATER CONVEYANCE CHANNELS (ES BMP 1.35); LEVEL SPREADERS (ES BMP 1.40); OUTLET PROTECTION (ES BMP 1.36); and PAVED FLUMES (ES BMP 1.31).

Outlets shall be constructed and stabilized prior to the operation of the diversion.

Stabilization

1. Unless otherwise stabilized, the ridge and channel shall be seeded and mulched within 15 days of installation in accordance with ES BMP 1.66 (PERMANENT SEEDING).

2. Disturbed areas draining into the diversion shall be seeded and mulched prior to or at the time the diversion is constructed.

3. Permanent diversions should include a filter strip of close growing grass maintained above the channel. The width of the filter, measured from the center of the channel, shall be one-half the channel width plus 15 feet.

Construction Specifications

1. All trees, brush, stumps, debris, and other obstructions shall be removed and disposed of so as not to interfere with the proper functioning of the diversion.

2. The diversion shall be excavated or shaped to line, grade, and cross-section as required to meet the criteria specified herein, free of irregularities which will impede flow.

3. Fills shall be compacted as needed to prevent unequal settlement that would cause damage in the complete diversion.

4. All earth removed and not needed in construction shall be spread or disposed of so that it will not interfere with the functioning of the diversion.

5. Permanent stabilization of disturbed areas shall be done in accordance with the applicable standard and specification contained in this handbook. Permanent stabilization techniques include PERMANENT SEEDING (ES BMP 1.66) and SODDING (ES BMP 1.67).

Maintenance

Before final stabilization, the diversion should be inspected after every rainfall. Sediment shall be removed from the ditchline and repairs made as necessary. Seeded areas which fail to establish a vegetative cover shall be reseeded as necessary.

R0071378

ES BMP 1.25

TEMPORARY SEDIMENT TRAP

Definition

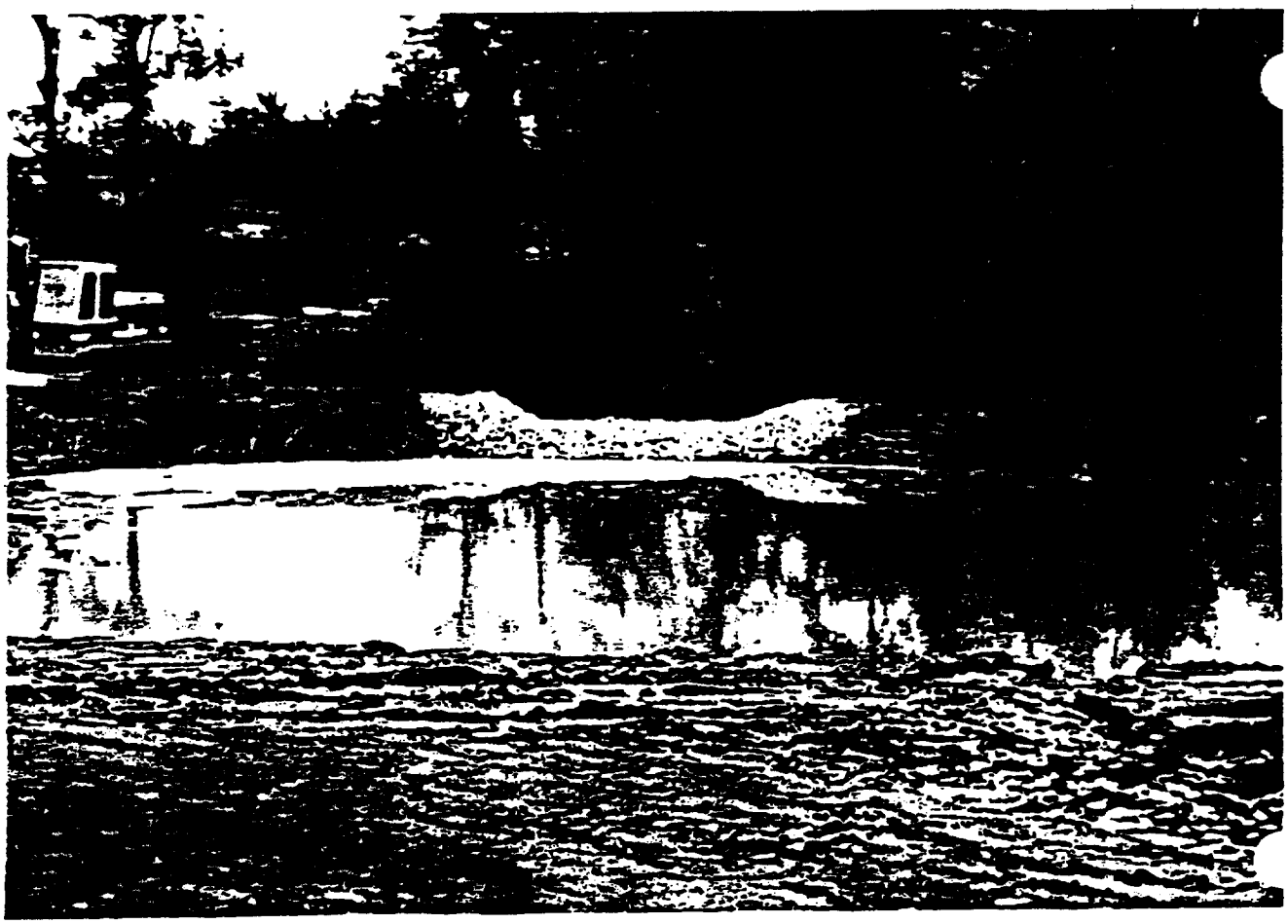
A small temporary ponding area formed by excavation and/or an embankment across a drainageway.

Purpose

To detain sediment-laden runoff from small disturbed areas long enough to allow the majority of the sediment to settle out thereby protecting drainageways, properties and rights-of-way from sedimentation.

Conditions Where Practice Applies

1. A sediment trap is usually installed in a drainageway, at a storm drain inlet or at other points of discharge from a disturbed area.



R0071379

2. Below drainage areas of 5 acres or less.

3. Where the sediment trap will be used less than 18 months.

4. The sediment trap may be constructed either independently or in conjunction with a TEMPORARY DIVERSION DIKE (ES BMP 1.15).

Planning Considerations

The sediment trap should be located to obtain the maximum storage benefit from the terrain, for ease of cleanout and disposal of the trapped sediment and to minimize interference with construction activities.

Sediment traps should be used only for small drainage areas. If the contributing drainage area is greater than 5 acres, refer to SEDIMENT BASINS (ES BMP 1.26).

Sediment must be periodically removed from the trap. Plans should detail how this sediment is to be disposed of, such as by use in fill areas on site or removal to an approved off-site dump.

Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Design Criteria

Trap Capacity

The sediment trap must have an initial storage volume of 67 cubic yards per acre of drainage area, measured from the low point of the ground to the crest of the gravel outlet. Sediment should be removed from the basin when the volume is reduced by one-half.

For a natural basin, the volume may be approximated as follows:

$V = 0.4 \times A \times D$

where,

V = the storage volume in $ft.^3$
A = the surface area of the flood area at the crest of the outlet, in $ft.^2$
D = the maximum depth, measured from the low point in the trap to the crest of the outlet, in ft.

Excavation

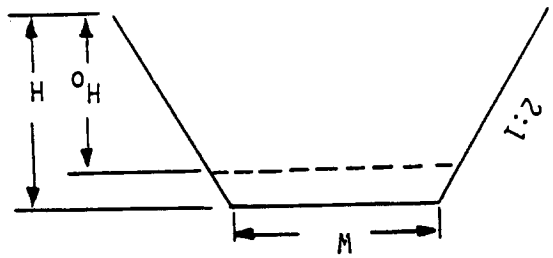
If excavation is necessary to attain the required storage volume, side slopes should be no steeper than 2:1.

R0071380

Embankment Cross-Section

The maximum height of the sediment trap embankment shall be 5 feet as measured from the low point. Minimum top widths (W) and outlet heights (H_o) for various embankment heights (H) are shown in Table 1.25a. Side slopes of the embankment shall be 2:1 or flatter.

Table 1.25a
MINIMUM TOP WIDTH (W) AND OUTLET HEIGHT (H_o)REQUIRED FOR SEDIMENT TRAP EMBANKMENTS ACCORDING TO HEIGHT OF EMBANKMENT (feet)



H	H_o	W
1.5	0.5	2.0
2.0	1.0	2.0
2.5	1.5	2.5
3.0	2.0	2.5
3.5	2.5	3.0
4.0	3.0	3.0
4.5	3.5	4.0
5.0	4.0	4.5

Source: Va SWCC

Outlet

The outlets shall be designed, constructed and maintained in such a manner that sediment does not leave the trap and that erosion of the outlet does not occur. A trap may have several different outlets with each outlet conveying part of the flow based on the criteria below and the combined outlet capacity shall meet that criteria. For example, a 12 foot earth outlet (adequate for 2 acres) and a 12 inch pipe outlet (adequate for 1 acre) could be used for a three acre drainage area.

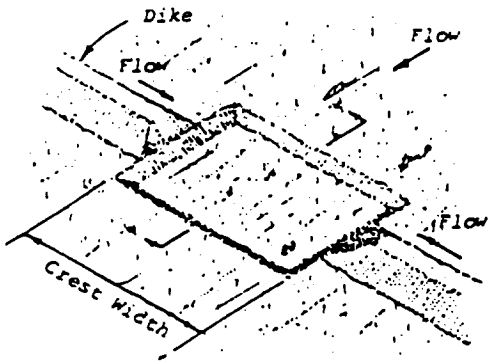
There are four types of outlets for sediment traps. Each sediment trap is named according to the type of outlet that it has. Each type has different design criteria and will be discussed separately.

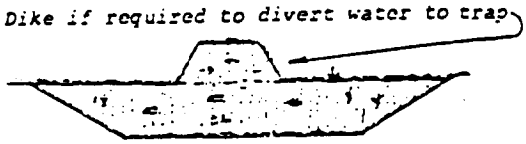
1. An Earth Outlet Sediment Trap (Plate 1.25a) consists of a basin formed by excavation and/or an embankment. The trap has a discharge point over or cut into natural ground. The outlet width (feet) shall be equal to 6 times the drainage area (acres). If an embankment is used the outlet crest shall be at least one foot below the top of the embankment. The outlet shall be free of any restriction to flow. The earthen embankment shall be seeded with temporary or permanent vegetation (see ES BMP 1.65 and 1.66) within 15 days of construction.

2. A Pipe Outlet Sediment Trap (Plate 1.25b) consists of a basin formed by an embankment of excavation and an embankment. The outlet for the trap is through a perforated riser and a pipe through the embankment. The outlet pipe and riser shall be made of corrugated metal. The riser diameter shall be of the same or larger diameter than the pipe. The top of the embankment shall be at least 1.5 feet above the crest of the riser. At least the top 2/3 of the riser shall be perforated with 1/2 inch diameter holes spaced 8 inches vertically and 10-12 inches horizontally. All pipe connections shall be watertight.

R0071381

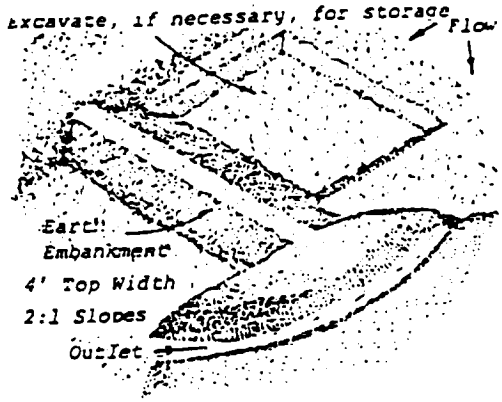
EARTH OUTLET SEDIMENT TRAP*

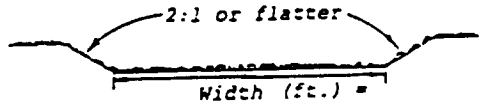




SECTION A-A

EXCAVATED EARTH OUTLET SEDIMENT TRAP





OUTLET SECTION

EMBANKMENT EARTH OUTLET SEDIMENT TRAP

Construction Specifications

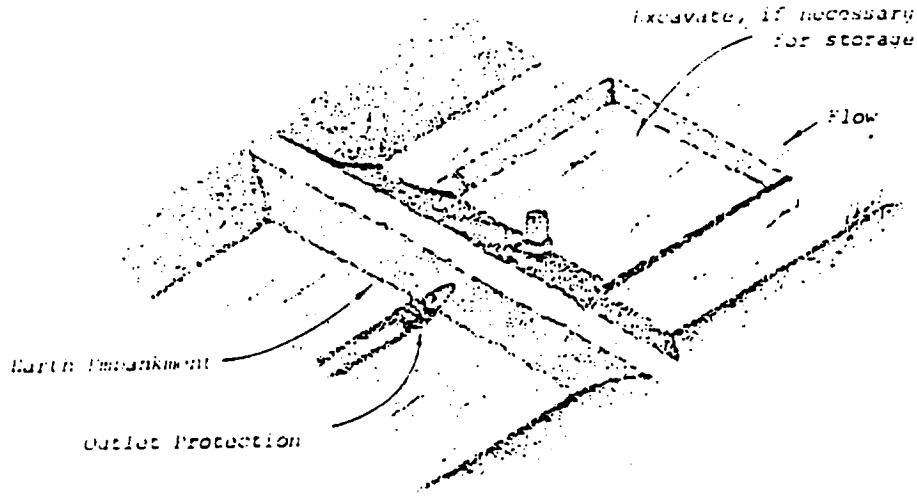
1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
4. The structure shall be inspected after each rain and repairs made as needed.
5. Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.
6. The structure shall be removed and area stabilized when the drainage area has been properly stabilized.
7. All cut and fill slopes shall be 2:1 or flatter.
8. Outlet crest elevation shall be at least one foot below the top of the embankment.

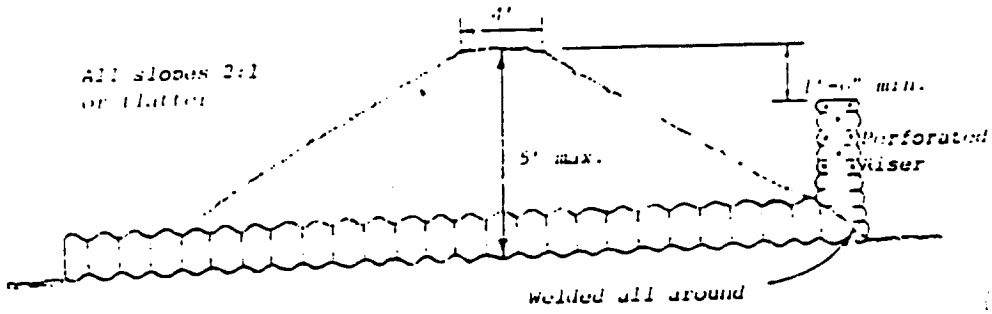
* Drainage area less than 5 acres

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE College Park, Md.	EARTH OUTLET SEDIMENT TRAP	Plate 1.25a

R0071382

PIPE OUTLET SEDIMENT TRAP*





EMBANKMENT SECTION THRU RISER

Construction Specifications

1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
4. The structure shall be inspected after each rain and repairs made as needed.
5. Construction operations shall be carried out in such a manner that erosion and water pollution is minimized.
6. The structure shall be removed and area stabilized when the drainage area has been properly stabilized.
7. All cut and fill slopes shall be 2:1 or flatter.
8. All pipe connections shall be watertight.
9. At least the top 2/3 of the riser shall be perforated with 1/2-inch diameter holes spaced 8 inches vertically and 10 - 12 inches horizontally.
10. Fill material around the pipe spillway shall be hand compacted in 4-inch layers. A minimum of two feet of hand-compacted backfill shall be placed over the pipe spillway before crossing it with construction equipment.

* Drainage area less than 5 acres.

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE College Park, MD.	PIPE OUTLET SEDIMENT TRAP	Plate 1.25b

R0071383

Select pipe diameter from the following table:

Min. Pipe Diameter	Max. Drainage Area (acres)
12"	1
18"	2
21"	3
24"	4
30"	5

3. A Stone Outlet Sediment Trap (Plate 1.25c) consists of a basin formed by an embankment or excavation and an embankment. The outlet for the sediment trap shall consist of a crushed stone section of the embankment located at the low point in the basin. The minimum length of the outlet shall be 6 feet times the acreage of the drainage area. The crest of the outlet must be at least 1.0 foot below the top of the embankment, to insure that the flow will travel over the stone and not the embankment. The outlet shall be constructed of FDOT No. 1 size crushed stone.

4. A Storm Inlet Sediment Trap (Plate 1.25d) consists of a basin formed by excavation or natural ground that discharges through an opening in a storm drain inlet structure. This opening can either be the inlet opening or a temporary opening made by omitting bricks or blocks in the inlet. A yard drain inlet or an inlet in the median strip of a dual highway would use the inlet opening for an outlet. A curb inlet would require a temporary opening. The trap should be out of the roadway to avoid interference with construction. Placing the trap on the opposite side of the opening and diverting water from the roadway to the trap is one means of accomplishing this.

Removal

Sediment traps must be removed after the contributing drainage area is stabilized. Plans should show how the site of the sediment trap is to be graded and stabilized after removal.

Construction Specifications

1. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat. To facilitate cleanout, the pool area should be cleared.

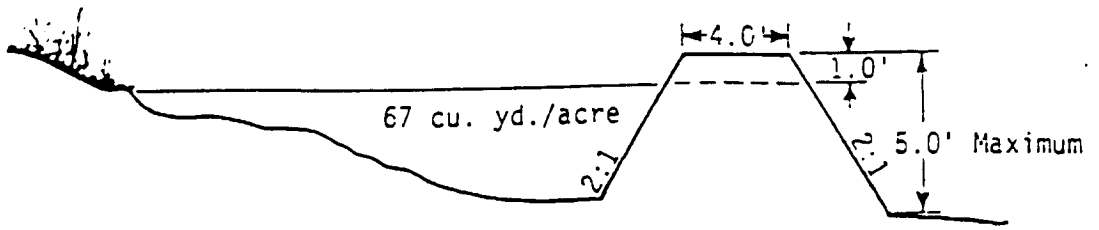
2. Fill material for the embankment shall be free of roots or other woody vegetation, organic material, large stones, and other objectionable material. The embankment should be compacted in 8-inch layers by traversing with construction equipment.

3. The earthen embankment shall be seeded with temporary or permanent vegetation (see ES BMP 1.65 and 1.66) within 15 days of construction.

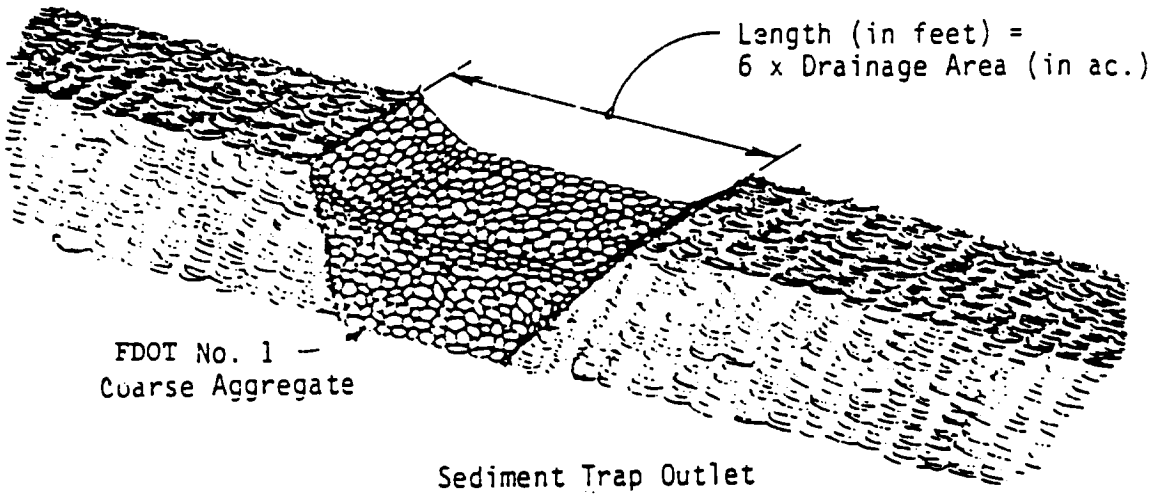
4. Construction operations shall be carried out in such a manner that erosion and water pollution are minimized.

R0071384

STONE OUTLET SEDIMENT TRAP*



Cross-Section



Sediment Trap Outlet

Construction Specifications

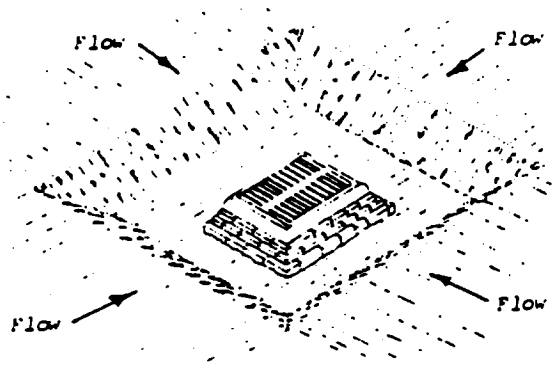
1. Area under embankment shall be cleared, grubbed and stripped of any vegetation and root mat. The pool area shall be cleared.
2. The fill material for the embankment shall be free of roots or other woody vegetation as well as over sized stones, rocks, organic material or other objectionable material. The embankment shall be compacted by traversing with equipment while it is being constructed.
3. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
4. The structure shall be inspected after each rain and repairs made as needed.
5. Construction operations shall be carried out in such a manner that erosion and water pollution is minimized.
6. The structure shall be removed and the area stabilized when the drainage area has been properly stabilized.
7. All cut and fill slopes shall be 2:1 or flatter.
8. **FDOT No. 1 coarse aggregate shall be used in the outlet.**

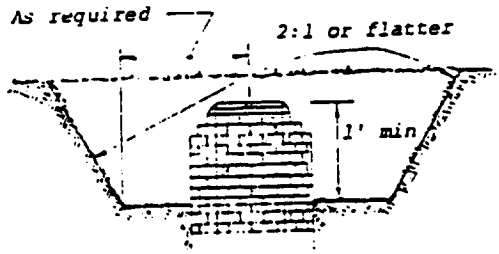
* Drainage area less than 5 acres.

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE College Park, Md.	STONE OUTLET SEDIMENT TRAP	Plate 1.25c

R0071385

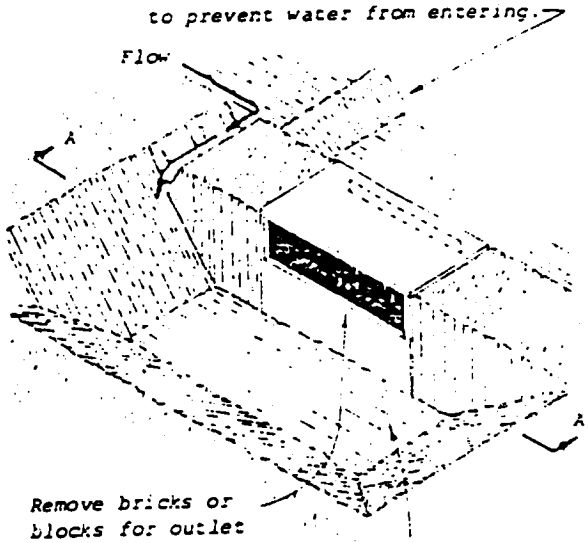
STORM INLET SEDIMENT TRAP*

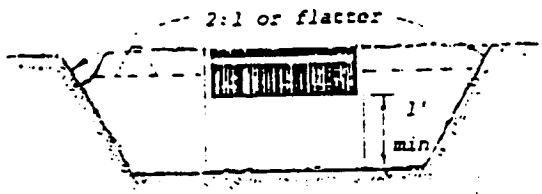




CROSS-SECTION

YARD DRAIN





SECTION A-A

CURB DRAIN

NOTE: Where curb is in place, provide a 1 ft. wide opening in the curb or use a sandbag dam to force water over the curb to the trap.

CONSTRUCTION SPECIFICATIONS

1. Sediment shall be removed and trap restored to its original dimensions when the sediment has accumulated to 1/2 the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such a manner that it will not erode.
2. The structure shall be inspected after each rain and repairs made as needed.
3. Construction operations shall be carried out in such a manner that erosion and water pollution shall be minimized.
4. The sediment trap shall be removed and area stabilized when the remaining drainage area has been properly stabilized.
5. All cut and fill slopes shall be 2:1 or flatter.

*Drainage area less than 5 acres.

U. S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE College Park, Md.	STORM INLET SEDIMENT TRAP	Plate 1.25d

R0071386

5. The structure shall be removed and the area stabilized when the upslope drainage area has been stabilized.

Maintenance

1. Sediment shall be removed and the trap restored to its original dimensions when the sediment has accumulated to 1/2 the design volume of the trap. Sediment removed from the basin shall be desposited in a suitable area and in such a manner that it will not erode.

2. The structure should be checked regularly to insure that it is structurally sound and has not been damaged by erosion or construction equipment. The height of the outlet should be checked to ensure that its center is at least one foot below the top of the embankment.

R0071387

ES BMP 1.26

TEMPORARY SEDIMENT BASIN

Definition

A temporary basin with a controlled stormwater release structure, formed by constructing an embankment of compacted soil across a drainageway.

Purpose

To detain sediment-laden runoff from disturbed areas long enough for the majority of the sediment to settle out.

Conditions Where Practice Applies

Below disturbed areas greater than 5 acres. There must be sufficient space and appropriate topography for the construction of a temporary impoundment. These structures are limited to a useful life of 18 months unless they are designed as permanent ponds by a qualified professional engineer.



R0071388

Planning Considerations

Effectiveness

Sediment basins are at best only 70-80% effective in trapping sediment which flows into them. Therefore, they should be used in conjunction with erosion control practices such as temporary seeding, mulching, diversion dikes, etc. to reduce the amount of sediment flowing into the basin.

Location

To improve the effectiveness of the basin, it should be located so as to intercept the largest possible amount of runoff from the disturbed area. The best locations are generally low areas and natural drainageways below disturbed areas. Drainage into the basin can be improved by the use of diversion dikes and ditches. The basin must not be located in a live stream but should be located to trap sediment-laden runoff before it enters the stream. The basin should not be located where its failure would result in the loss of life or interruption of the use or service of public utilities or roads.

Multiple Use

Sediment basins may be designed as permanent structures to remain in place after construction is completed. The Stormwater Rule (Ch. 17-25, F.A.C.) makes the use of these structures desirable for stormwater detention purposes. Wherever these structures are to become permanent, or if they exceed the size limitations of the design criteria, they must be designed as permanent ponds by a qualified professional engineer. Permanent ponds are beyond the scope of these ES BMP.

Design Criteria

Maximum Drainage Area

Unless the structure is designed as a permanent pond by a qualified professional engineer, the maximum allowable drainage area into the basin shall be 150 acres.

Basin Capacity

The design capacity of the basin must be at least 67 cubic yards per acre of drainage area, measured from the bottom of the basin to the crest of the principal spillway (riser pipe). Sediment should be removed from the basin when the volume of the basin has been reduced to 27 cubic yards per acre of drainage area. In no case shall the sediment cleanout level be higher than one foot below the top of the riser. The elevation of the sediment cleanout level should be calculated and clearly marked on the riser. (See Plate 1.26a).

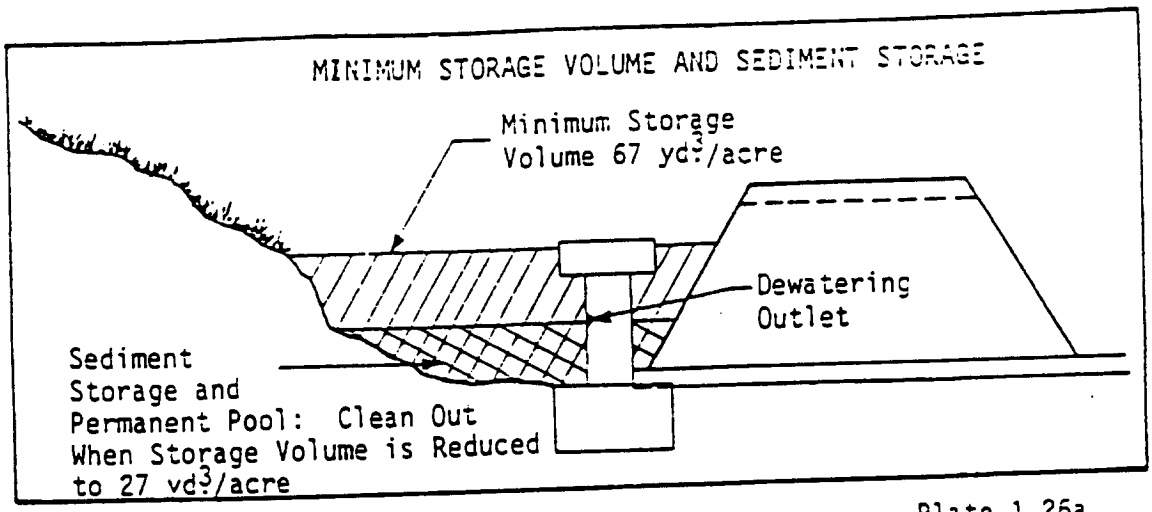


Plate 1.26a

Source: VaSWCC

Basin Shape

To improve sediment trapping efficiency of the basin, the effective flow length must be twice the effective flow width. This basin shape may be attained by properly selecting the site of the basin, by excavation, or by the use of baffles. See Appendix 1.26A for design details.

Embankment Cross-Section

The embankment must have a minimum top width of 8 feet. The side slopes must be 2:1 or flatter. The embankment may have a maximum height of 10 feet if the side slopes are 2:1. If the side slopes are 2.5:1 or flatter, the embankment may have a maximum height of 15 feet.

Spillway Design

The outlets for the basin may consist of a combination of principal and emergency spillways or a principal spillway alone. In either case, the outlet(s) must pass the peak runoff expected from the drainage area for a 10-year storm without damage to the embankment of the basin. Runoff computations shall be based upon the soil cover conditions which are expected to prevail during the life of the basin. Refer to Chapter 5 of this manual for calculation of the peak rate of runoff.

The spillways designed by the procedures contained in this ES BMP will not necessarily result in any reduction in the peak rate of runoff. If a reduction in peak runoff is desired, the appropriate hydrographs should be generated to choose the basin and outlet sizes.

To increase the efficiency of the basin, the spillway(s) must be designed to maintain a permanent pool of water between storm events.

Principal Spillway

The principal spillway shall consist of a solid (non-perforated), vertical pipe or box of corrugated metal or reinforced concrete joined by a watertight connection to a horizontal pipe (barrel) extending through the embankment and outletting beyond the downstream toe of the fill. If the principal spillway is used in conjunction with an emergency spillway, the principal spillway shall have a minimum capacity of 0.2 cfs per acre of drainage area when the water surface is at the crest of the emergency spillway. If no emergency spillway is used, the principal spillway must be designed to pass the entire peak flow expected from a 10-year storm. See Appendix 1.26A for design details.

Design Elevations - If the principal spillway is used in conjunction with an emergency spillway, the crest of the principal spillway shall be a minimum of 1.0 foot below the crest of the emergency spillway. If no emergency spillway is used, the crest of the principal spillway shall be a minimum of 3 feet below the top of the embankment. (See Plate 1.26b.) In either case, a minimum freeboard of 1.0 foot shall be provided between the design high water and the top of the embankment.

Anti-vortex device and trash rack - An anti-vortex device and trash rack shall be attached to the top of the principal spillway to improve the flow of water into the spillway and prevent floating debris from being carried out of the basin. The anti-vortex device shall be of the concentric type as shown in Plate 1.26j. See Appendix 1.26A for design procedures for the anti-vortex device and trash rack.

Dewatering - Shall be done in such a manner as to remove the relatively clean water without removing any of the sediment that has settled out and without removing any appreciable quantities of floating debris. As a minimum, provisions shall be made to dewater the basin down to the sediment cleanout elevation. This can be accomplished by providing a hole at the maximum sediment retention elevation (See Plate 1.26o). The dewatering hole shall be no larger than 4 inches in diameter. Other means of automatic dewatering are detailed in Appendix 1.26A.

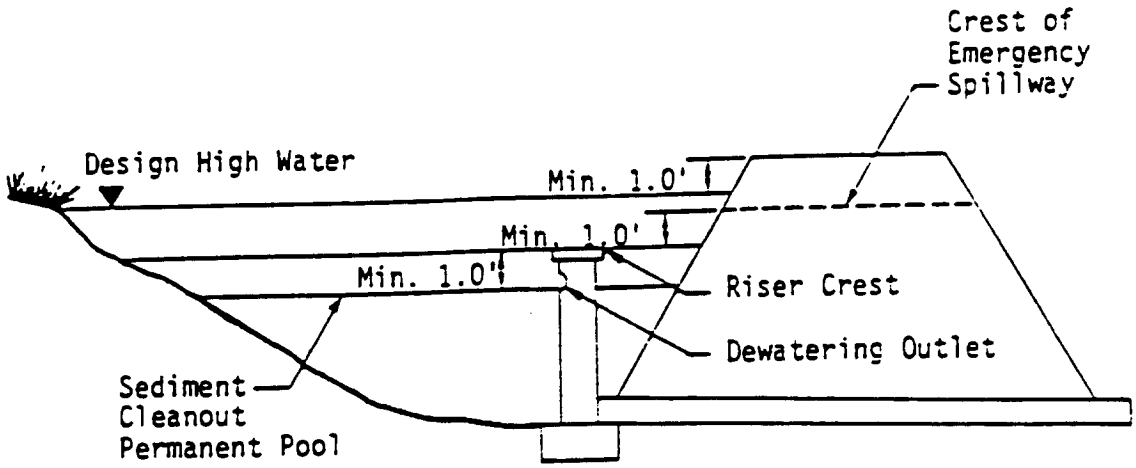
It is also advantageous (but not required) to provide for dewatering of trapped sediment before cleanout. Basin underdrains are generally installed for this purpose. Appendix 1.26A contains details for the design of an underdrain system.

Base - The base of the principal spillway must be firmly anchored to prevent its floating. If the riser of the spillway is greater than 10 feet in height, computations must be made to determine the anchoring requirements. As a minimum, a factor of safety of 1.25 shall be used (downward forces = 1.25 x upward forces).

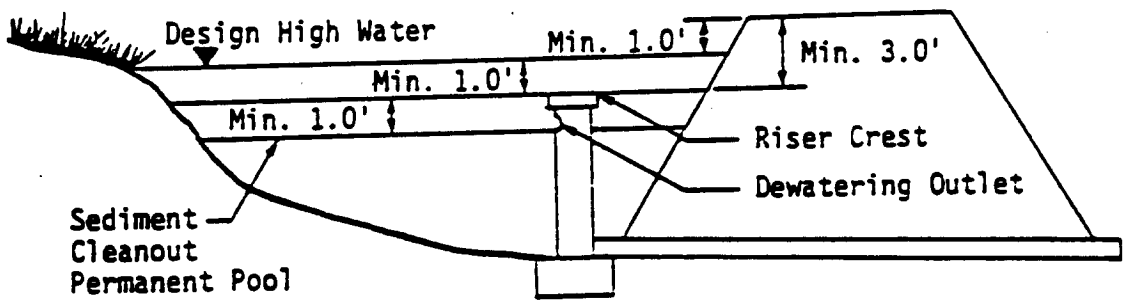
For risers 10 feet or less in height, the anchoring may be done in one of the two following ways:

1. A concrete base 18 inches thick and twice the width of riser diameter shall be used and the riser embedded 6 inches into the concrete. See Plate 1.26c and Appendix 1.26A for design details.

SEDIMENT BASIN SCHEMATIC ELEVATIONS



Design Elevations With Emergency Spillway



Design Elevations Without Emergency Spillway

Source: Va SWCC

Plate 1.26b

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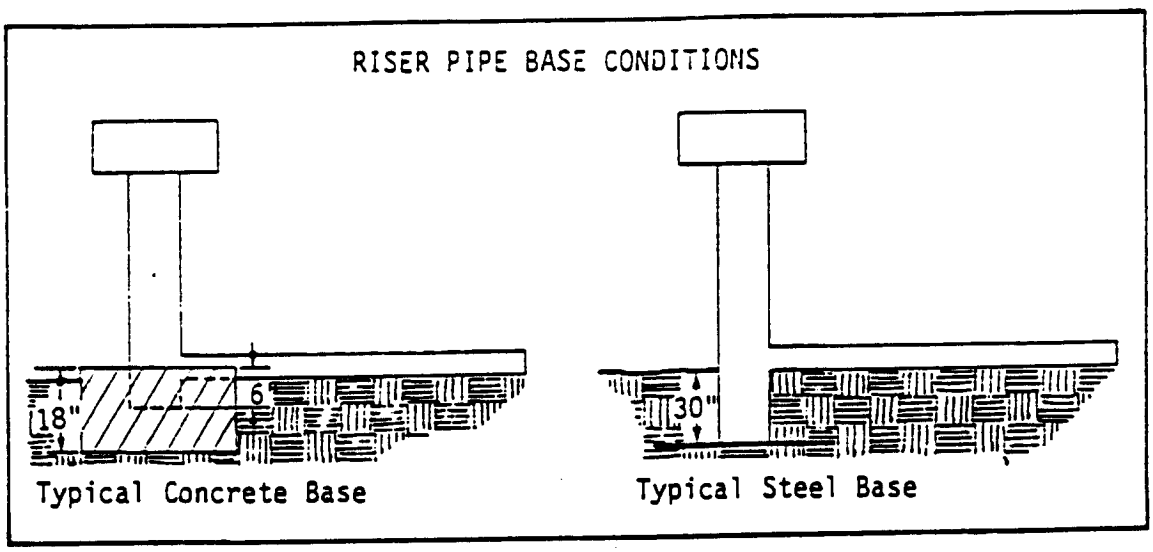
2. A square steel plate, a minimum of 1/4 inch thick and having a width equal to twice the diameter of the riser, shall be welded to the base of the riser. The plate shall then be covered with 2.5 feet of stone, gravel, or compacted soil to prevent floatation. See Plate 1.26c and Appendix 1.26A for design details.



Source: Va SWCC

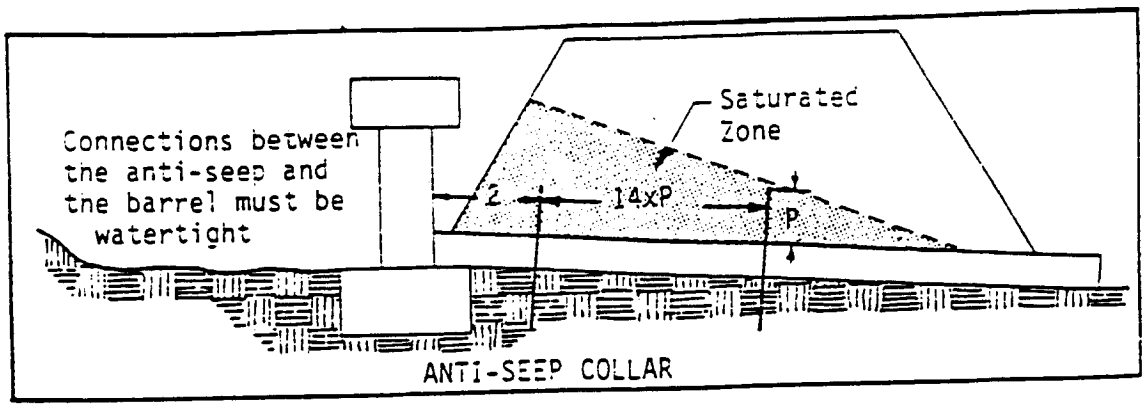
Plate 1.26c

Barrel - The barrel of the principal spillway, which extends through the embankment, shall be designed to carry the flow provided by the riser of the principal spillway with the water level at the crest of the emergency spillway. The connection between the riser and the barrel must be watertight. The outlet of the barrel must be protected to prevent erosion or scour of downstream areas. See Appendix 1.26A for design details.

Anti-seep collars - Anti-seep collars shall be used on the barrel of the principal spillway within the normal saturation zone of the embankment to increase the seepage length by at least 10%, if either of the following two conditions is met:

1. The settled height of the embankment exceeds 10 feet.
2. The embankment has a low silt-clay content (Unified Soil Classes SM or GM) and the barrel is greater than 10 inches in diameter.

The anti-seep collars shall be installed within the saturated zone. The maximum spacing between collars shall be 14 times the projection of the collar above the barrel. Collars shall not be closer than 2 feet to a pipe joint. Collars should be placed sufficiently far apart to allow space for hauling and compacting equipment. Connections between the collars and the barrel shall be watertight. See Plate 1.26d and Appendix 1.26A for design procedure and details.

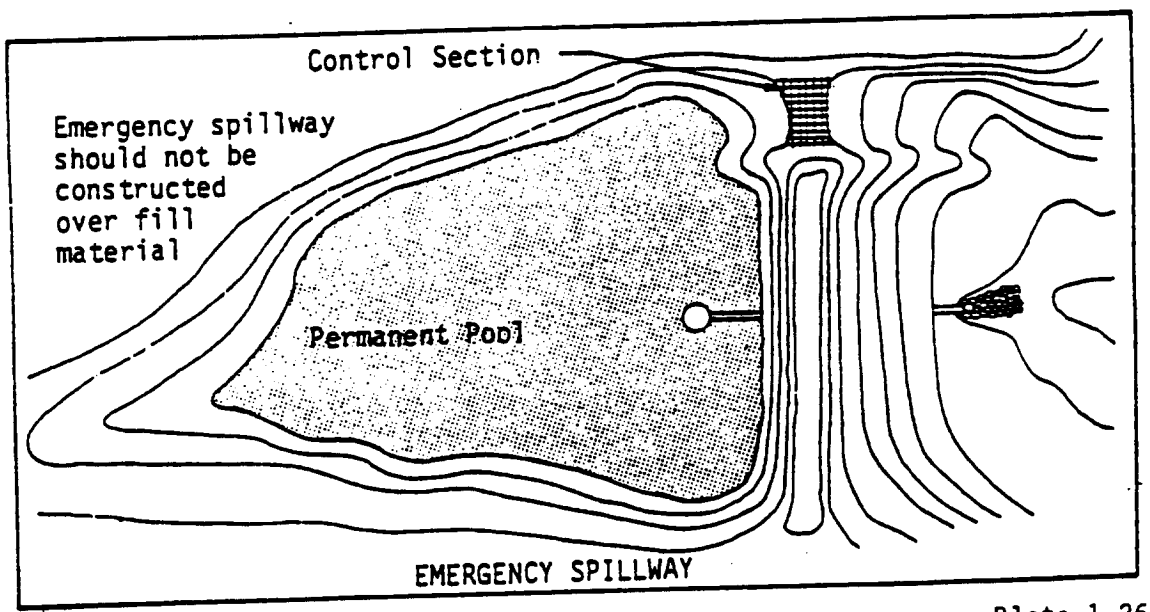


Source: VA SWCC

Plate 1.26d

Emergency Spillway

The emergency spillway shall consist of an open channel constructed adjacent to the embankment over undisturbed material (not fill). The spillway shall have a control section at least 20 feet in length. The control section is a level portion of the spillway channel at the highest elevation in the channel. See Appendix 1.26A and Plate 1.26e.



Source: Va SWCC

Plate 1.26e

Capacity - The emergency spillway shall be designed to carry the peak rate of runoff expected from a 10-year storm, less any reduction due to the flow through the principal spillway. See Appendix 1.26A for design details.

Design elevations - The design high water through the emergency spillway shall be at least 1.0 foot below the top of the embankment. The crest of the emergency spillway channel shall be at least 1.0 foot above the crest of the principal spillway.

Location - The emergency spillway channel shall be located so that it will not be constructed over fill material. The channel shall be located so as to avoid sharp turns or bends. The channel shall return the flow of water to a defined channel downstream from the embankment.

Maximum velocities - The maximum allowable velocity in the emergency spillway channel will depend upon the type of lining used. For vegetated linings, allowable velocities are listed in Table 1.35a (STORMWATER CONVEYANCE CHANNEL, ES BMP 1.35). For non-erodible linings, such as concrete or asphalt paving and riprap, design velocities may be increased. However, the emergency spillway channel shall return the flow to the natural channel at a non-eroding velocity. See Appendix 1.26A for design details.

Stabilization of the Embankment and Basin

The embankment of the sediment basin shall be temporarily seeded within 15 days after its completion (see TEMPORARY SEEDING, ES BMP 1.65). If excavation is required in the basin, side slopes should not be steeper than 2:1.

Disposal

Cleanout - Sediment shall be removed from the basin when the capacity is reduced to 27 cubic yards per acre of drainage area. Plans for the sediment basin shall indicate the methods for disposing of sediment removed from the basin. Possible alternatives are the use of the material in fill areas on-site or removal to an approved off-site dump.

Final removal - Sediment basin plans shall indicate the final disposition of the sediment basin after the upstream drainage area is stabilized. The plans shall indicate methods for the removal of excess water lying over the sediment, stabilization of the basin site, and the disposal of any excess material. Sediment shall not be flushed into the stream or drainageway.

Safety

Sediment basins are attractive to children and can be very dangerous. Therefore, they should be fenced or otherwise made inaccessible to persons or animals unless this is deemed unnecessary due to the remoteness of the site or other circumstances. Strategically placed signs around the impoundment reading "DANGER-QUICKSAND" should also be installed. In any case, local ordinances and regulations regarding health and safety must be adhered to.

Construction Specifications

Site Preparation

Areas under the embankment and any structural works shall be cleared, grubbed, and stripped of topsoil to remove trees, vegetation, roots, or other objectionable material. In order to facilitate cleanout and restoration, the pool area (measured at the top of the principal spillway) will be cleared of all brush and trees.

Cutoff Trench

For earth fill embankments, a cutoff trench shall be excavated along the centerline of the dam. The minimum depth shall be 2 feet. The cutoff trench shall extend up both abutments to the riser crest elevation. The minimum bottom width shall be 4 feet, but wide enough to permit operation of compaction equipment. The side slopes shall be no steeper than 1:1.

Compaction requirements shall be the same as those for the embankment. The trench shall be drained during the backfilling-compacting operations.

Embankment

The fill material shall be taken from approved borrow areas. It shall be clean mineral soil, free of roots, woody vegetation, oversized stones, rocks, or other objectionable material. Areas on which fill is to be placed shall be scarified prior to placement of fill. The fill material should contain sufficient moisture so that it can be formed by hand into a ball without crumbling. If water can be squeezed out of the ball, it is too wet for proper compaction. Fill material will be placed in 6-to-8-inch continuous layers over the entire length of the fill. Compaction shall be obtained by routing the hauling equipment over the fill so that the entire surface of the fill is traversed by at least one wheel or tread track of the equipment, or by using a compactor. The embankment shall be constructed to an elevation 10% higher than the design height to allow for settlement if compaction is obtained with hauling equipment. If compactors are used for compaction, the overbuild may be reduced to not less than 5%.

Principal Spillway

The riser of the principal spillway shall be securely attached to the barrel by a watertight connection. The barrel and riser shall be placed on a firm compacted soil foundation. The base of the riser shall be firmly anchored according to design criteria to prevent its floating. Pervious material such as sand, gravel or crushed stone shall not be used as backfill around the barrel or anti-seep collars. Fill material shall be placed around the pipe in 4-inch layers and compacted by hand at least to the same density as the embankment. A minimum of two feet of fill shall be hand-compacted over the barrel before crossing it with construction equipment.

Emergency Spillway

The emergency spillway should not be constructed over fill material. Design elevations, widths, entrance and exit channel slopes are critical to the successful operation of the spillway and should be adhered to closely during construction.

Vegetative Stabilization

The embankment and emergency spillway of the sediment basin shall be stabilized with temporary vegetation within 15 days of completion of the basin (see TEMPORARY SEEDING, ES BMP 1.65).

Erosion and Sediment Control

The construction of the sediment basin shall be carried out in a manner such that erosion and water pollution are minimized downstream.

Safety

All state and local requirements shall be met concerning fencing and signs warning the public of the hazards of soft sediment and flood waters.

Final Disposal

When temporary structures have served their intended purpose and the contributing drainage area has been properly stabilized, the embankment and resulting sediment deposits are to be leveled or otherwise disposed of in accordance with the approved pollution control plan.

Maintenance

The embankment of the basin should be checked regularly to ensure that it is structurally sound and has not been damaged by erosion or construction equipment.

The emergency spillway should be checked regularly to ensure that its lining is well established and erosion-resistant.

The basin should be checked after each runoff-producing rainfall for sediment cleanout. When the sediment reaches the cleanout level, it shall be removed and properly disposed of.

Information to be Submitted for Approval

Sediment Basin designs and construction plans submitted for review to the appropriate regulatory agency shall include:

A. Specific location of the dam.
B. Plan view of dam, storage basin and emergency spillway.
C. Cross section of dam, principal spillway and emergency spillway; profile of emergency spillway.
D. Details of pipe connections, riser to pipe connection, riser base, anti-seep collars, trash rack and anti-vortex device.
E. Runoff calculations for 10-year frequency storm.
F. Storage Computations
    1. Total required
    2. Total available
    3. Level of sediment at which cleanout shall be required; to be stated as a distance from the riser crest to the sediment surface.
G. Calculations showing design of pipe and emergency spillway.

NOTE: Items E through G above may be submitted using the design data sheet in the Appendix.

APPENDIX 1.26A

Design Procedure for Temporary Sediment Basin

The following design procedure provides a step-by-step method for the design of a temporary sediment basin. The data sheet found in the back of this Appendix should be used in the erosion and sediment control plan to outline design values calculated.

I. Basin Volume

A. Determine the required basin volume. A volume of 67 $yd.^3$, measured from the ground surface to the crest of the principal spillway, is required for each acre draining into the basin. The volume of a naturally shaped basin may be approximated by the equation:

$$V = 0.4 \times A \times D$$

where,

V = the storage volume in $ft.^3$
A = the surface area flooded, with the water level at the crest of the principal spillway.
D = the depth of the basin measured from the ground surface to the crest of the principal spillway.

The volume may also be computed from contour information or other suitable methods.

B. If the volume of the basin is inadequate, excavate to obtain the required volume.

II. Basin Shape

A. The shape of the basin must be such that the length-to-width ratio is at least 2 to 1 according to the following equation:

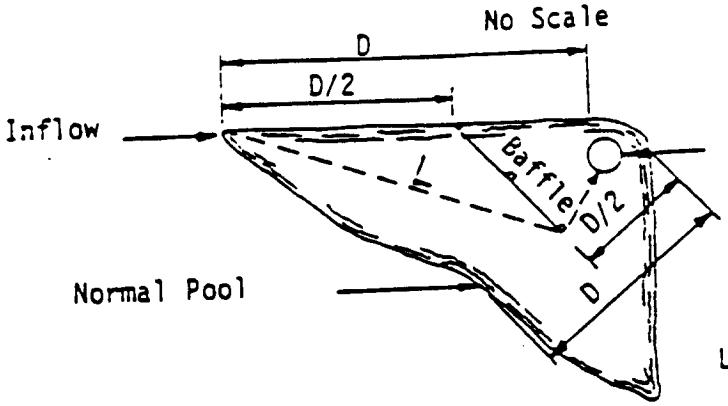
$$\text{Length-to-width ratio} = \frac{L}{We}$$

where,

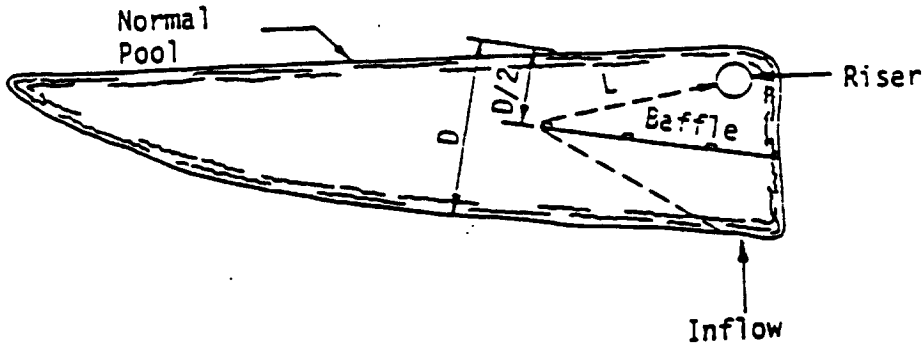
We = the effective width (A/L).
A = the surface area of the normal pool.
L = the length of the flow path from the inflow to the outflow. If there is more than one inflow point, any inflow which carries more than 30% of the peak rate of inflow must meet these criteria.

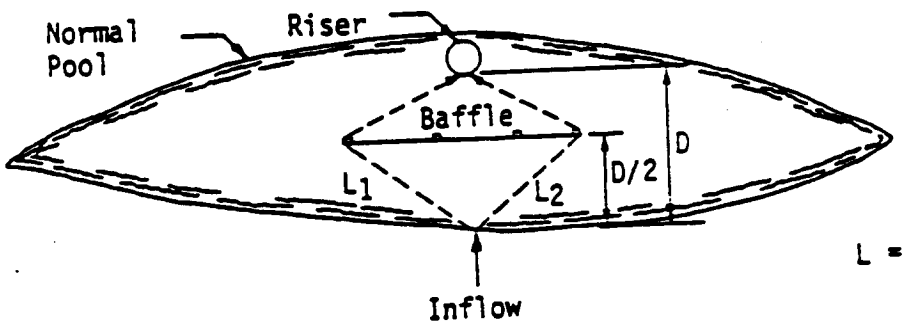
EXAMPLE PLAN VIEWS OF BAFFLE LOCATIONS IN SEDIMENT BASINS

No Scale



L = Total distance from the point of inflow around the baffle to the riser.





$L = L_1 + L_2$

Baffle Detail

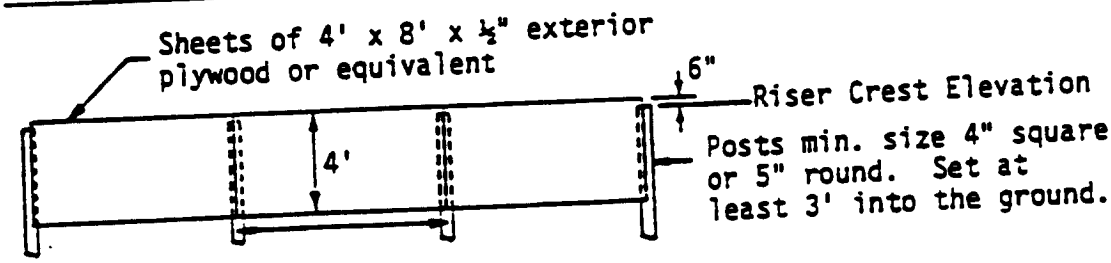


Plate 1.26f

Source: USDA-SCS

B. The correct basin shape can be obtained by proper site selection, excavation, or the use of baffles. Baffles increase the flow length by deflecting the flow. The baffles should be placed halfway between the inflow point and the outflow. Plate 1.26f shows the detail for baffle construction and three situations where baffles might be used.

III. Determine whether the basin will have an emergency spillway.

IV. Determine the elevation of the crest of the principal spillway for the required volume.

V. Estimate the elevation of the design high water and the required height of the dam.

A. If an emergency spillway is included, the crest of the principal spillway must be at least 1.0 foot below the crest of the emergency spillway.

B. The elevation of the flow through the emergency spillway (which will be the design high water) must be at least 1.0 foot below the top of the embankment.

C. If an emergency spillway is not included, the crest of the principal spillway must be at least 3 feet below the top of the embankment.

D. The elevation of the design high water must be 1.0 foot below the top of the embankment.

VI. From Chapter 5 of this manual determine the peak rate of runoff expected from the drainage area of the basin for a ten-year storm.

VII. Principal Spillway Design

A. If an emergency spillway is included, the principal spillway must pass a minimum of 0.2 cfs/acre of drainage area.

1. Compute, Q_p = 0.2 x drainage area, the peak rate of runoff the principal spillway must pass.

B. If an emergency spillway is not included, the principal spillway must pass the peak rate of runoff from the basin drainage area for a 10-year storm.

1. Q_p = the 10-year peak rate of runoff.

C. Refer to Plate 1.26g, where h is the difference between the elevation of the crest of the principal spillway and the elevation of the crest of the emergency spillway.

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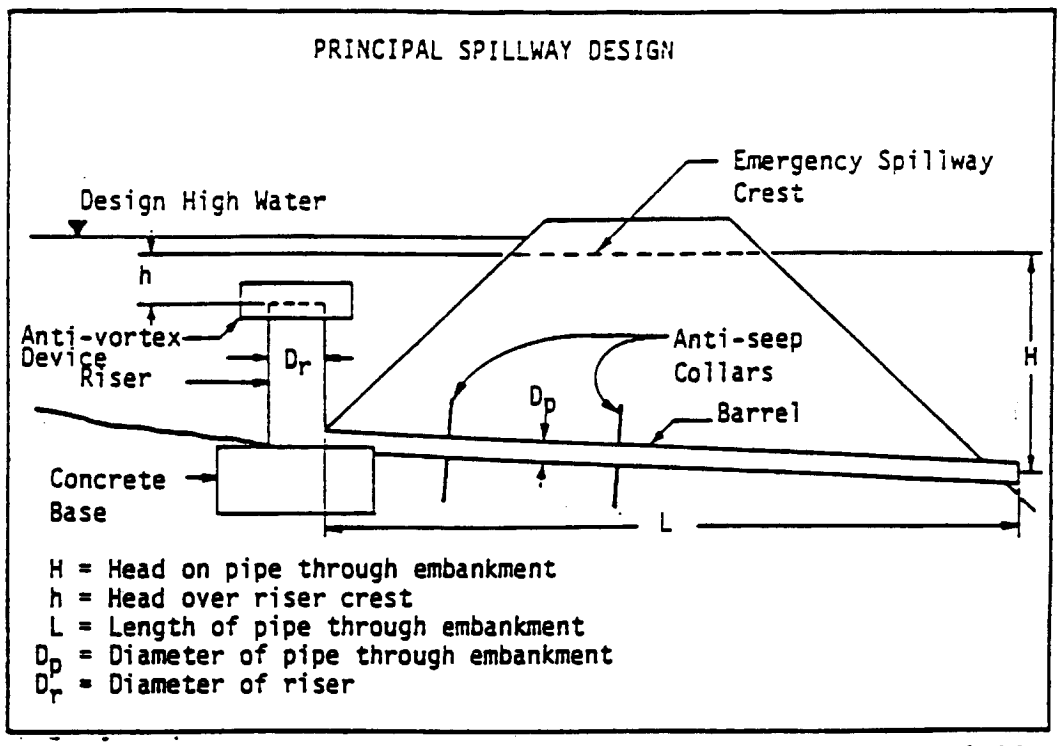
D. Enter Plate 1.26h with Q_p. Choose the smallest riser which will pass the required flow with the available head, h.

E. Refer to Plate 1.26g, where H is the difference in elevation of the centerline of the outlet of the barrel and the crest of the emergency spillway. L is the length of the barrel through the embankment.

F. Enter Table 1.26a or Table 1.26b with H. Choose the smallest-size barrel which will pass the flow provided by the riser. If L is other than 70 ft., make the necessary correction.



Source: Va SWCC Plate 1.26g

VIII. Emergency Spillway Design

A. The emergency spillway must pass the remainder of the 10-year peak runoff not carried by the principal spillway.

B. Compute, $Q_e = Q_{10} - Q_p$.

C. Refer to Plate 1.26i and Table 1.26c.

D. Determine approximate permissible values for b, the bottom width; s, the slope of the exit channel; and X, minimum length of the exit channel.

E. Enter Table 1.26c and choose a channel cross-section which passes the required flow and meets the other constraints of the site.

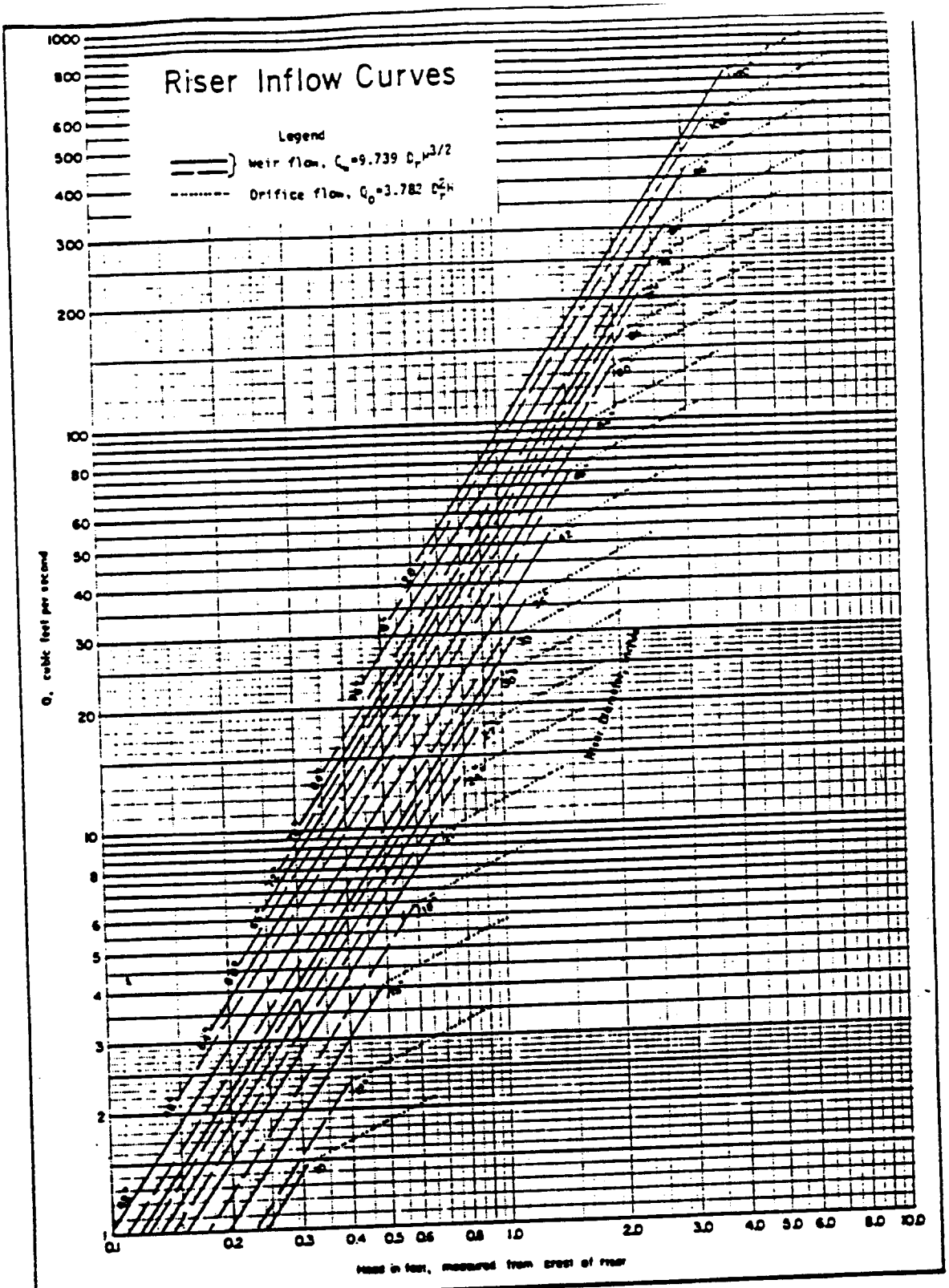


Plate 1.26h

Source: USDA-SCS

Table 1.26a
PIPE FLOW CHART n = 0.025

Source: USDA-SCS

FOR CORRUGATED METAL PIPE INLET $K_m = K_e + K_b = 1.0$ AND 70 FEET OF CORRUGATED METAL PIPE CONDUIT (full flow assumed)
Note correction factors for pipe lengths other than 70 feet

H, in feet \ diameter of pipe in inches	6"	8"	10"	12"	15"	18"	21"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"
1	0.33	0.70	1.25	1.98	3.48	5.47	7.99	11.0	18.8	28.8	41.1	55.7	72.6	91.8	113	137	163	191	222	255	290
2	0.47	0.99	1.76	2.80	4.92	7.74	11.3	15.6	26.6	40.8	58.2	78.8	103	130	160	194	231	271	314	360	410
3	0.58	1.22	2.16	3.43	6.02	9.48	13.8	19.1	32.6	49.9	71.2	96.5	126	159	196	237	282	331	384	441	502
4	0.67	1.40	2.49	3 97	6.96	10.9	16.0	22.1	37.6	57.7	82.3	111	145	184	226	274	326	383	444	510	580
5	0.74	1.57	2.79	4.43	7.78	12.2	17.9	24.7	42.1	64.5	92.0	125	162	205	253	306	365	428	496	570	648
6	0.82	1.72	3.05	4.86	8.52	13.4	19.6	27.0	46.1	70.6	101	136	178	225	277	336	399	469	544	624	710
7	0.88	1.86	3.30	5.25	9.20	14.5	21.1	29.2	49.8	76.3	109	147	192	243	300	362	431	506	587	674	767
8	0.94	1.99	3.53	5.61	9.84	15.5	22.6	31.2	53.2	81.5	116	158	205	260	320	388	461	541	628	721	820
9	1.00	2.11	3.74	5.95	10.4	16.4	24.0	33.1	56.4	86.5	123	167	218	275	340	411	489	574	666	764	870
10	1.05	2.22	3.94	6.27	11.0	17.3	25.3	34.9	59.5	91.2	130	176	230	290	358	433	516	605	702	806	917
11	1.10	2.33	4.13	6.58	11.5	18.2	26.5	36.6	62.4	95.6	136	185	241	304	376	454	541	635	736	845	962
12	1.15	2.43	4.32	6.87	12.1	19.0	27.7	38.2	65.2	99.9	142	193	252	318	392	475	565	661	769	883	1004
13	1.20	2.53	4.49	7.15	12.6	19.7	28.8	39.8	67.8	104	148	201	262	331	408	494	588	690	800	919	1045
14	1.25	2.63	4.66	7.42	13.0	20.5	29.9	41.3	70.4	108	154	208	272	343	424	513	610	716	830	953	1085
15	1.29	2.72	4.83	7.68	13.5	21.2	30.9	42.8	72.8	112	159	216	281	355	439	531	631	741	860	987	1123
16	1.33	2.81	4.99	7.93	13.9	21.9	32.0	44.2	75.2	115	165	223	290	367	453	548	652	765	888	1019	1160
17	1.37	2.90	5.14	8.18	14.3	22.6	32.9	45.5	77.5	119	170	230	229	378	467	565	672	789	915	1051	1195
18	1.41	2.98	5.29	8.41	14.8	23.2	33.9	46.8	79.8	120	174	236	308	389	480	581	692	817	942	1081	1230
19	1.45	3.06	5.43	8.64	15.2	23.9	34.8	48.1	82.0	126	179	243	316	400	494	597	711	834	967	1111	1264
20	1.49	3.14	5.57	8.87	15.6	24.5	35.7	49.4	84.1	129	184	249	325	410	506	613	729	856	993	1139	1297
21	1.53	3.22	5.71	9.09	15.9	25.1	36.6	50.6	86.2	132	188	255	333	421	519	628	747	877	1017	1168	1329
22	1.56	3.29	5.85	9.30	16.3	25.7	37.5	51.8	88.2	135	193	261	341	430	531	643	765	898	1041	1195	1360
23	1.60	3.37	5.98	9.51	16.7	26.2	38.3	53.0	90.2	138	197	267	348	440	543	657	782	918	1064	1222	1390
24	1.63	3.44	6.11	9.72	17.0	26.8	39.1	54.1	92.1	141	201	273	356	450	555	671	799	937	1087	1248	1420
25	1.66	3.51	6.23	9.92	17.4	27.4	39.9	55:2	94.0	144	206	279	363	459	566	685	815	957	1110	1274	1450
26	1.70	3.58	6.36	10.1	17.7	27.9	40.7	56.3	95.9	147	210	284	370	468	577	699	831	976	1132	1299	1478
27	1.73	3.65	6.48	10.3	18.1	28.4	41.5	57.4	97.7	150	214	290	377	477	588	712	847	994	1153	1374	1507
28	1.76	3.72	6.60	10.5	18.4	29.0	42.3	58.4	99.5	153	218	295	384	486	599	725	863	1013	1174	1348	1514
29	1.79	3.78	6.71	10.7	18.7	29.5	43.0	59.5	101	155	221	300	391	494	610	738	878	1030	1195	1372	1561
30	1.82	3.85	6.83	10.9	19.1	30.0	43.7	60.5	103	158	225	305	398	503	620	750	893	1048	1216	1196	1588
L, in feet \ Correction Factors For Other Pipe Lengths																					
20	1.69	1.63	1.58	1.53	1.47	1.42	1.37	1.34	1.28	1.24	1.20	1.18	1.16	1.14	1.13	1.11	1.10	1.10	1.09	1.08	1.08
30	1.44	1.41	1.39	1.36	1.32	1.29	1.27	1.24	1.21	1.18	1.15	1.13	1.12	1.11	1.10	1.09	1.08	1.07	1.07	1.06	1.06
40	1.28	1.27	1.25	1.23	1.21	1.20	1.18	1.17	1.14	1.12	1.11	1.10	1.09	1.08	1.07	1.06	1.06	1.05	1.05	1.05	1.04
50	1.16	1.16	1.15	1.14	1.13	1.13	1.11	1.10	1.09	1.08	1.07	1.06	1.06	1.05	1.05	1.04	1.04	1.04	1.03	1.03	1.03
60	1.07	1.07	1.07	1.06	1.06	1.05	1.05	1.05	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.01
70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	.94	.94	.95	.95	.95	.95	.96	.96	.96	.97	.97	.97	.98	.98	.98	.98	.98	.98	.99	.99	.99
90	.89	.89	.90	.90	.91	.91	.92	.92	.93	.94	.94	.95	.95	.96	.96	.96	.97	.97	.97	.97	.94
100	.85	.85	.86	.86	.87	.88	.89	.89	.90	.91	.92	.93	.93	.94	.94	.95	.95	.95	.96	.96	.94
120	.78	.79	.79	.90	.81	.82	.83	.83	.85	.86	.87	.89	.89	.90	.91	.89	.92	.93	.93	.91	.94
140	.72	.73	.74	.75	.76	.77	.78	.79	.81	.82	.84	.85	.86	.87	.88	.86	.89	.90	.91	.93	.92
160	.68	.69	.69	.70	.71	.73	.74	.75	.77	.79	.80	.82	.83	.84	.85	.92	.87	.88	.89	.89	.90

R0071403

Table 1.26b
PIPE FLOW CHART n = 0.013

FOR REINFORCED CONCRETE PIPE INLET $K_e = K_a + K_b = 0.65$ AND 70 FEET OF REINFORCED CONCRETE PIPE CONDUIT (full flow assumed)

Note correction factors for pipe lengths other than 70 feet

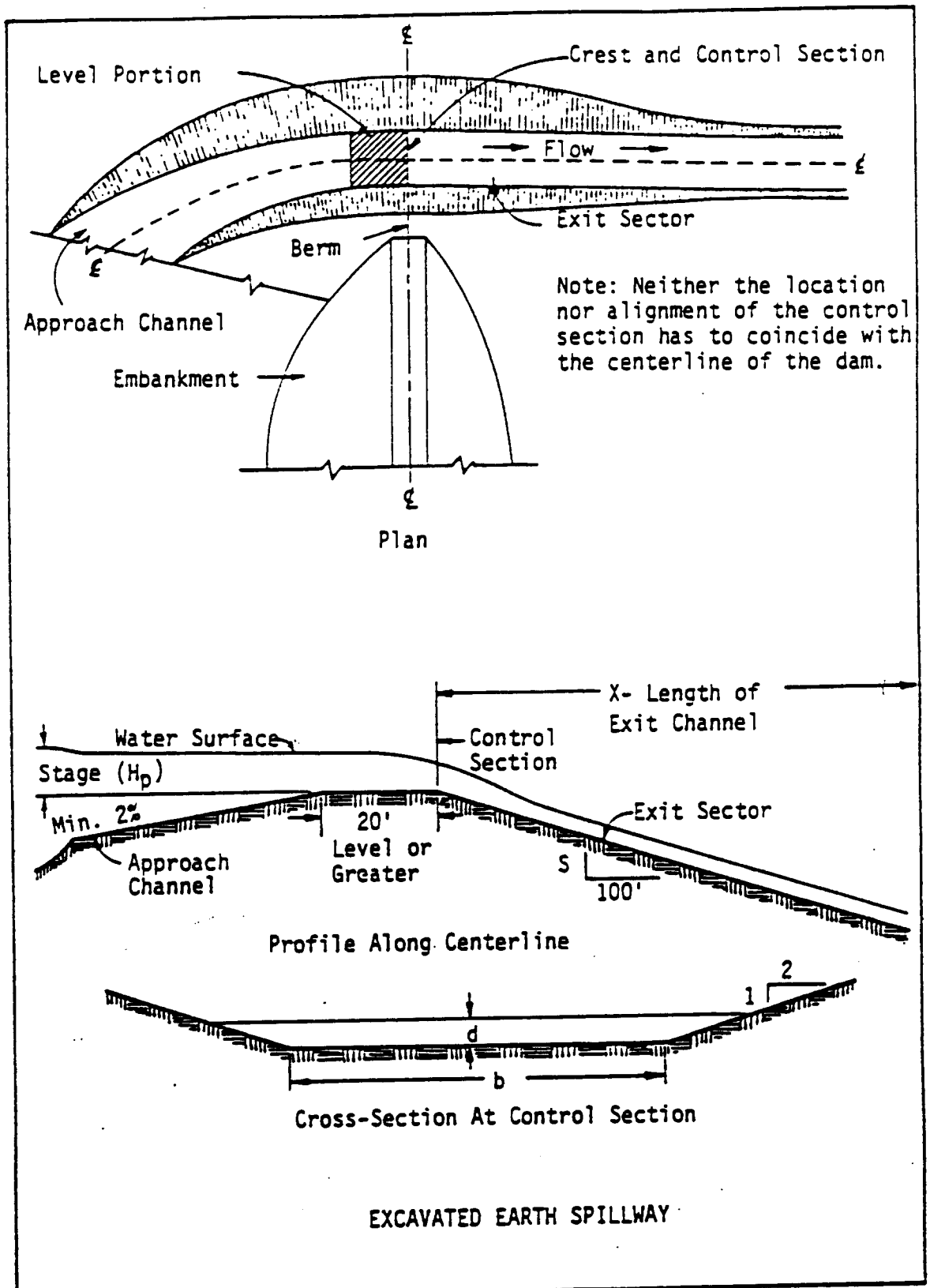
diameter of pipe in inches

H, in feet	12"	15"	18"	21"	24"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"	90"	96"	102"
1	3.33	5.04	6.39	11.8	15.9	26.0	38.6	53.8	71.4	91.5	113	139	167	197	229	264	302	343
2	4.55	7.69	11.7	16.7	22.5	36.8	54.6	76.0	101	129	161	197	236	278	324	374	427	485
3	5.57	9.42	14.4	20.4	27.5	45.0	66.9	93.1	124	159	198	241	289	341	397	458	523	594
4	6.43	10.9	16.6	23.5	31.8	52.0	77.3	108	143	183	228	278	334	394	459	529	604	686
5	7.19	12.2	18.5	26.3	35.5	58.1	86.4	120	160	205	255	311	373	440	513	591	675	766
6	7.88	13.3	20.3	28.8	38.9	63.7	94.6	132	175	224	280	341	409	482	562	647	739	839
7	8.51	14.4	21.9	31.1	42.0	68.8	102	142	189	242	302	368	441	521	607	699	798	906
8	9.10	15.4	23.5	33.3	44.9	73.5	109	152	202	259	323	394	472	557	649	748	854	969
9	9.65	16.3	24.9	35.3	47.7	78.0	116	161	214	275	342	418	500	590	688	793	905	1025
10	10.2	17.2	26.2	37.2	50.2	82.2	122	170	226	289	361	440	527	622	725	836	954	1080
11	10.7	18.0	27.5	39.0	52.7	86.2	128	178	237	304	379	462	553	653	761	877	1001	1133
12	11.1	18.9	28.7	40.8	55.0	90.1	134	186	247	317	395	482	578	682	794	916	1045	1184
13	11.6	19.6	29.9	42.4	57.3	93.7	139	194	257	330	411	502	601	710	827	953	1088	1232
14	12.0	20.4	31.0	44.1	59.4	97.3	145	201	267	342	427	521	624	736	858	989	1129	1278
15	12.5	21.1	32.1	45.6	61.5	101	150	208	277	354	442	539	646	762	888	1024	1169	1323
16	12.9	21.8	33.2	47.1	63.5	104	155	215	286	366	457	557	667	787	917	1057	1207	1367
17	13.3	22.4	34.2	48.5	65.5	107	159	222	294	377	471	574	688	812	946	1090	1244	1409
18	13.7	23.1	35.2	49.9	67.4	110	164	228	303	388	484	591	708	835	973	1121	1280	1450
19	14.0	23.7	36.1	51.3	69.2	113	168	234	311	399	497	607	727	858	1000	1152	1315	1489
20	14.4	24.3	37.1	52.6	71.0	116	173	240	319	409	510	623	746	880	1026	1182	1350	1528
21	14.7	24.9	38.0	53.9	72.8	119	177	246	327	419	523	638	764	902	1051	1211	1383	1566
22	15.1	25.5	38.9	55.2	74.5	122	181	252	335	429	535	653	782	921	1076	1240	1415	1603
23	15.4	26.1	39.8	56.5	76.2	125	186	258	342	439	547	668	800	944	1100	1268	1447	1639
24	15.8	26.7	40.6	57.7	77.8	127	189	263	350	448	559	682	817	964	1123	1295	1478	1674
25	16.1	27.2	41.5	58.9	79.4	130	193	269	357	458	571	696	834	984	1147	1322	1509	1708
26	16.4	27.7	42.3	60.0	81.0	133	197	274	364	467	582	710	850	1004	1169	1348	1539	1742
27	16.7	28.3	43.1	61.2	82.5	135	201	279	371	476	593	723	867	1023	1192	1373	1568	1775
28	17.0	28.8	43.9	62.3	84.1	138	204	285	378	484	604	737	883	1041	1214	1399	1597	1808
29	17.3	29.3	44.7	63.4	85.5	140	208	290	384	493	615	750	898	1060	1235	1423	1625	1840
30	17.6	29.8	45.4	64.5	87.0	142	212	294	391	501	625	763	913	1078	1256	1448	1651	1871

L, in feet	Correction Factors For Other Pipe Lengths																	
20	1.30	1.24	1.21	1.18	1.15	1.12	1.10	1.08	1.07	1.06	1.05	1.05	1.04	1.04	1.01	1.01	1.01	1.01
30	1.22	1.18	1.15	1.13	1.12	1.09	1.08	1.06	1.05	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.02	1.02
40	1.15	1.13	1.11	1.10	1.08	1.07	1.05	1.05	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.02	1.02	1.02
50	1.09	1.08	1.07	1.06	1.05	1.04	1.04	1.03	1.03	1.02	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01
60	1.04	1.04	1.03	1.03	1.03	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01
70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
80	.96	.97	.97	.97	.98	.98	.98	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99	.99
90	.93	.94	.94	.95	.95	.96	.97	.97	.98	.98	.98	.98	.98	.98	.98	.98	.98	.99
100	.90	.91	.92	.93	.93	.95	.95	.96	.97	.97	.97	.98	.98	.98	.98	.98	.98	.98
120	.84	.86	.87	.89	.90	.91	.93	.94	.94	.95	.96	.96	.96	.97	.97	.97	.97	.98
140	.80	.82	.83	.85	.86	.88	.90	.91	.92	.93	.94	.94	.95	.95	.96	.96	.96	.97
160	.76	.78	.80	.82	.83	.86	.88	.89	.90	.91	.92	.93	.94	.94	.95	.95	.95	.96

Source: USDA-SCS

R0071404



Source: USDA-SCS

Plate 1.26i

R0071405

F. Note:

1. Maximum permissible velocity for vegetated waterways is 6 ft./sec.
2. For a given H_p, a decrease in the exit slope from S as given in the table decreases spillway discharge but increasing the exit slope from S does not increase discharge. If an exit slope (S_e) steeper than S is used, the velocity (V_e) in the exit channel will increase according to the following relationship:

$$V_e = \frac{V(S_e)^{0.3}}{S}$$

3. Data to right of heavy vertical lines should be used with caution, as the resulting sections will be either poorly proportioned or have velocities in excess of 6 ft./sec.

IX. Re-estimate the elevation of the design high water and the top of the dam based upon the design of the principal spillway and the emergency spillway.

X. Anti-vortex device and trash rack.

A. This design procedure refers only to riser pipes of corrugated metal.

B. Refer to Plate 1.26j and Table 1.26d. Choose cylinder size, support bars, and top requirements from Plate 1.26p based on the diameter of the riser pipe.

XI. Anti-seep collars.

A. Anti-seep collars must be used under the conditions specified in the Design Criteria.

B. Anti-seep collars are used to increase the seepage length along the barrel by 10%.

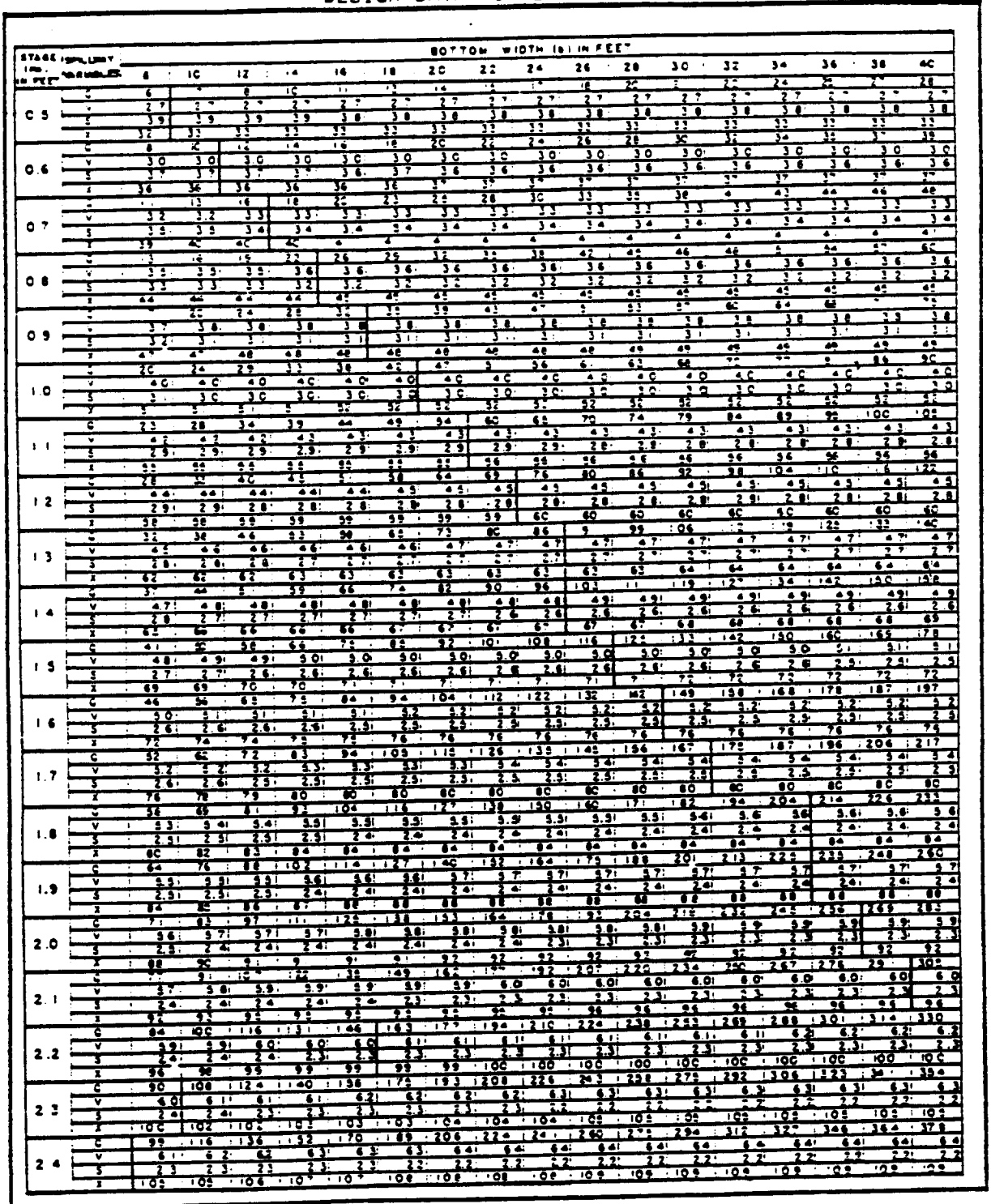
C. Determine the length of the barrel within the saturated zone. This may be done graphically as in Plate 1.26k or by solving the following equation:

$$L_S = Y\ (Z + 4)\ \left(1 + \frac{S}{0.25 - S}\right)$$

where,

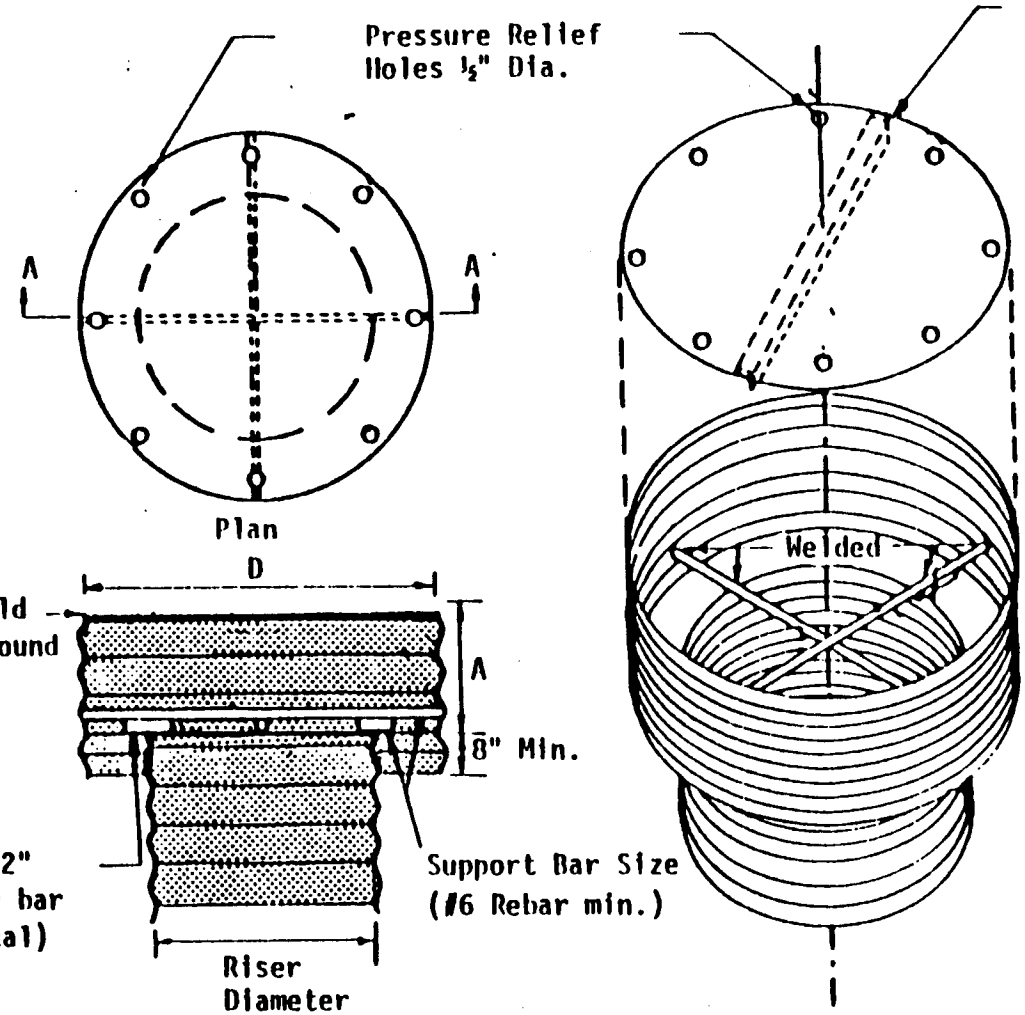
L_S = length of barrel in the saturated zone, feet.
Y = the depth of water at the principal spillway crest, feet.
Z = slope of the upstream face of the embankment in Z feet horizontal to one vertical.
S = slope of the barrel in feet per foot.

Table 1.26c
DESIGN DATA FOR EARTH SPILLWAYS



Source: USDA-SCS

Source: USDA-SCS



Top stiffener (if required) is ___x___x___ angle welded to top and oriented perpendicular to corrugations.

Top is ___ gage corrugated metal or 1/8" steel plate. Pressure relief holes may be omitted, if ends of corrugations are left fully open when the top is attached.

Cylinder is ___gage corrugated metal pipe or fabricated from 1/8" steel plate.

Notes:
1. The cylinder must be firmly fastened to the top of the riser.
2. Support bars are welded to the top of the riser or attached by straps bolted to top of riser

ANTI - VORTEX DEVICE DESIGN

Plate 1.26j

Table 1.26d

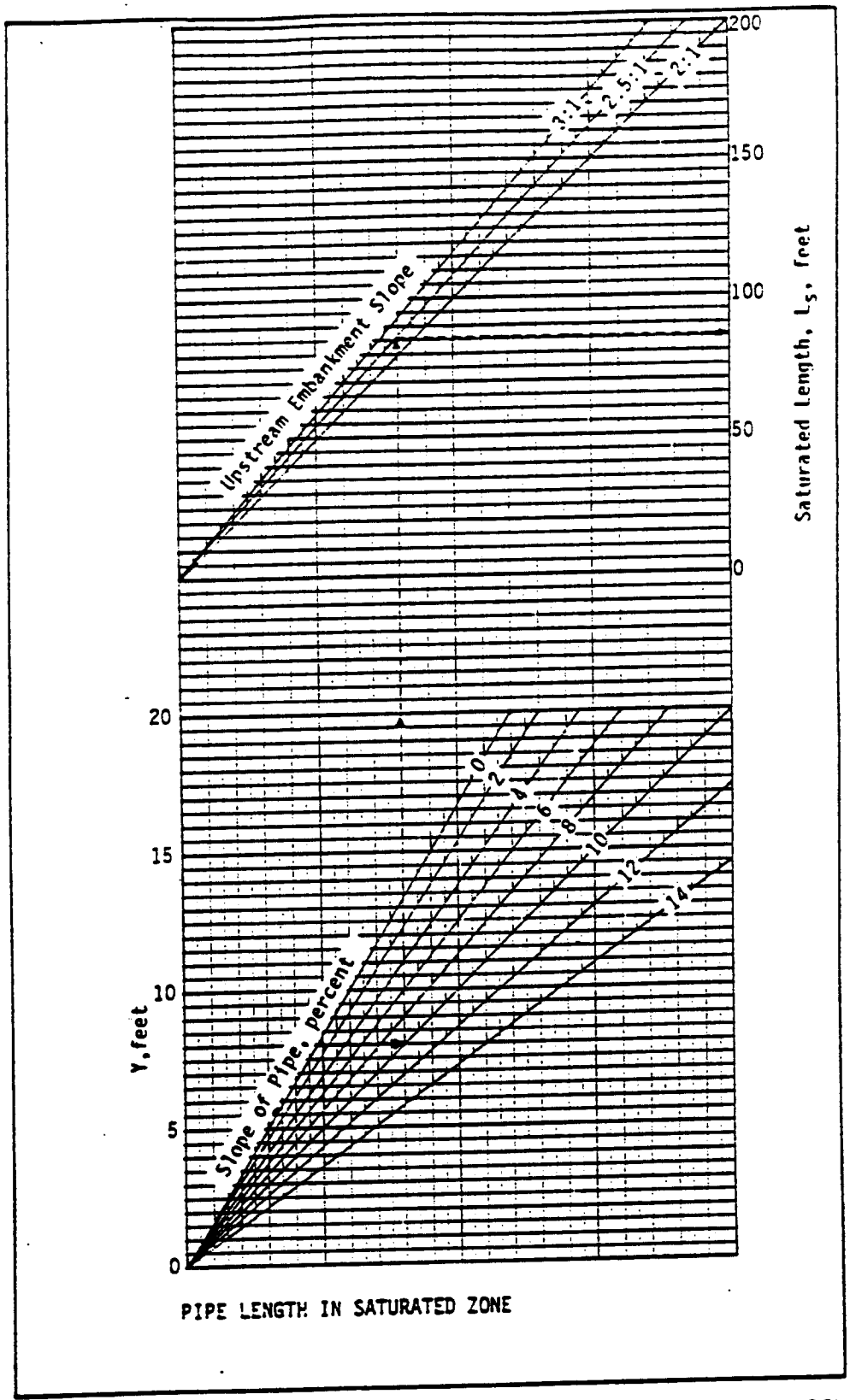
CONCENTRIC TRASH RACK AND ANTI-VORTEX DEVICE DESIGN TABLE

Diam./in.	Cylinder Diam. in.	Cylinder Thick. gauge	H/in.	Minimum Size Support Bar	Minimum Top Thickness	Minimum Top Stiffener
12	18	16	6	#6 Rebar	16 ga.	-
15	21	16	7	"	"	-
18	27	16	8	"	"	-
21	30	16	11	"	"	-
24	36	16	13	"	14 ga.	-
27	42	16	15	"	"	-
36	54	14	17	#8 Rebar	12 ga.	-
42	60	14	19	"	"	-
48	72	12	21	1-1/4" pipe or 1-1/4"x1-1/4x1/4 angle	10 ga.	-
54	78	12	25	"	"	-
60	90	12	29	1-1/2" pipe or 1-1/2x1-1/2x1/4 angle	8 ga.	-
66	96	10	33	2" pipe or 2x2x3/16 angle	8 ga., w/stiffener	2x2x1/4 angle
72	102	10	36	"	"	2-1/2x2-1/2x 1/4 angle
78	114	10	39	2-1/2" pipe or 2x2x1/4 angle	"	"
84	120	10	42	2-1/2" pipe or 2-1/2x2-1/2x1/4 angle	"	2-1/2x2-1/2x 5/16 angle

Note: The criterion for sizing the cylinder is that the area between the inside of the cylinder and the outside of the riser is equal to or greater than the area inside the riser. Therefore, the above table is invalid for use with concrete pipe risers.

Source: USDA-SCS

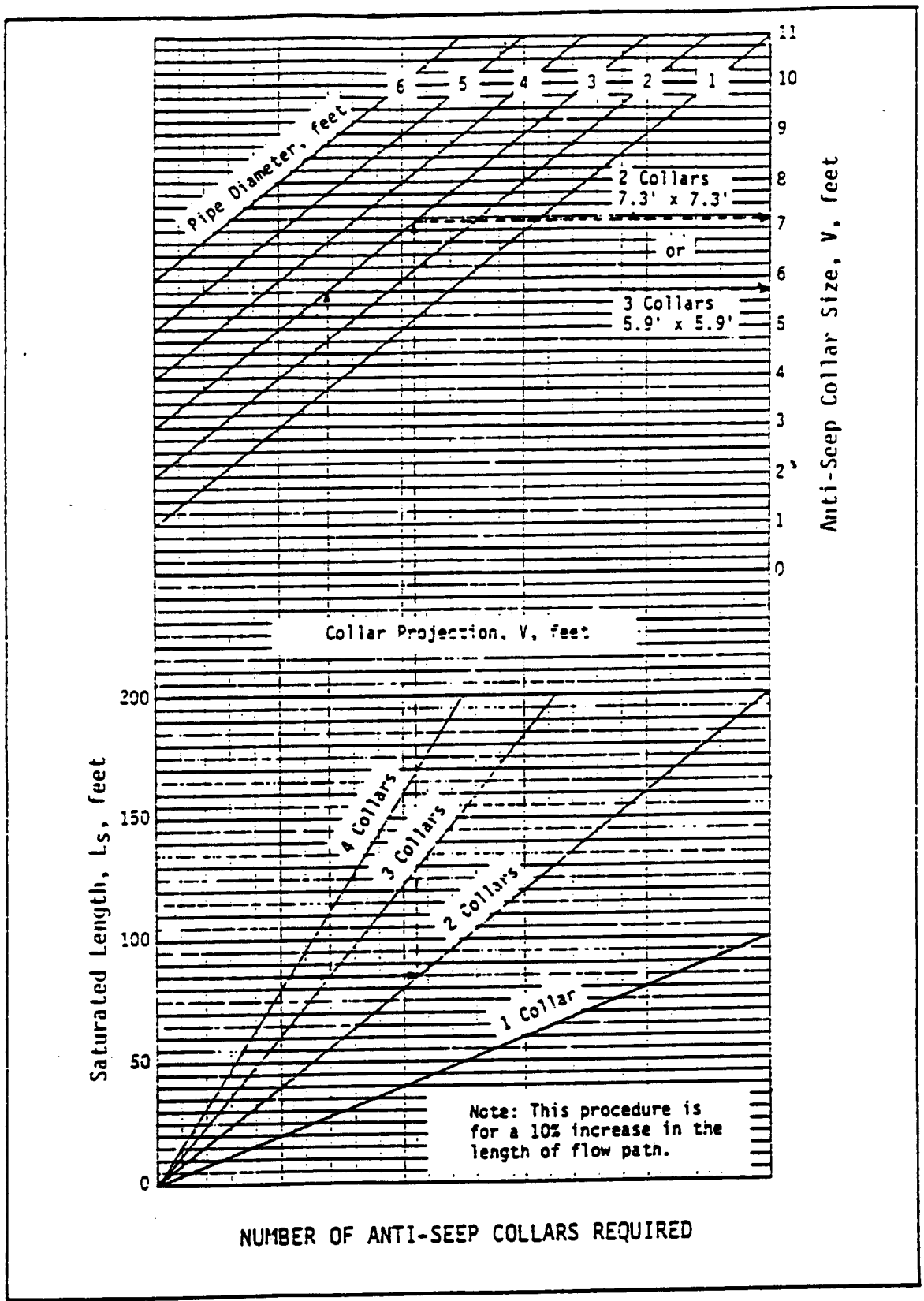
R0071409



Source: USDA-SCS

Plate 1.26k

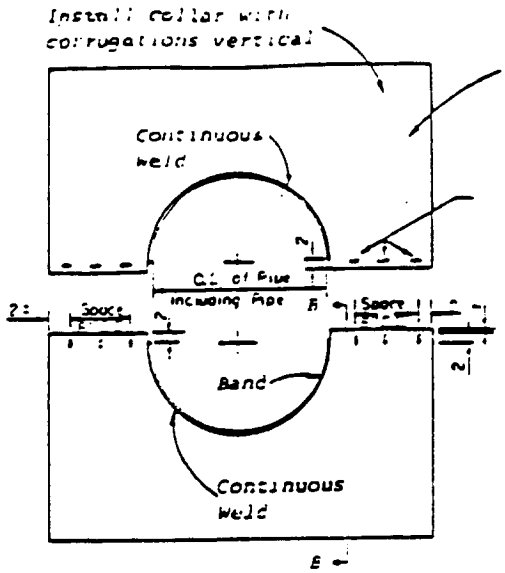
R0071410



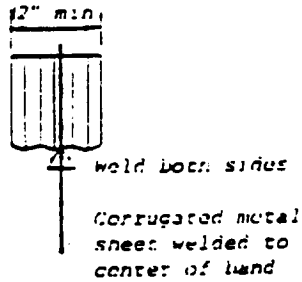
Source: USDA-SCS

Plate 1.261

R0071411



ELEVATION OF UNASSEMBLED COLLAR



SECTION E-E

NOTES FOR COLLARS:

1. All materials to be in accordance with construction and construction material specifications.
2. When specified on the plans, coating of collars shall be in accordance with construction and construction material specifications.
3. Unassembled collars shall be marked by painting or tagging to identify matching pairs.
4. The lap between the two half sections and between the pipe and connecting band shall be caulked with asphalt mastic at time of installation.
5. Each collar shall be furnished with two 1/2" diameter rods with standard tank lugs for connecting collars to pipe.

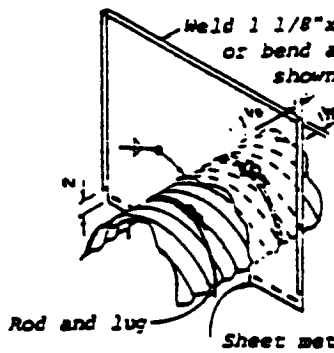
DETAILS OF CORRUGATED METAL ANTI-SEEP COLLAR

Size and spacing of slotted openings shall be the same as shown for CM collar

Use rods and lugs to clamp bands securely to pipe



PARTIAL ELEVATION



NOTE FOR BANDS AND COLLARS: Modifications of the details shown may be used providing equal watertightness is maintained and detailed drawings are submitted and approved by the Engineer prior to delivery.

Sheet metal collar shall be cut to fit corrugations of helical band, and welded with a continuous weld.

ISOMETRIC VIEW

NOTE: For details of fabrication dimensions, minimum gages, slotted holes, and notes, see detail above.

DETAILS OF HELICAL PIPE ANTI-SEEP COLLAR

NOTE: Two other types of anti-seep collars are:

1. Corrugated metal, similar to upper detail, except shop welded to a short (4 ft.) section of the pipe and connected with connecting bands to the pipe.
2. Concrete, six inches thick formed around the pipe with #3 rebar spaced 15" horizontally and vertically.

Ref: Engr. Field Manual

Source: USDA-SCS

Plate 1.26m

R0071412

D. Enter Plate 1.26l with L_s. Move horizontally right until one of the lines is intersected. Move vertically until the correct line for barrel diameter is intersected. Move horizontally right to read P, the size of the anti-seep collar.

E. If more than one collar is used, the spacing between collars should be 14 times the projection of the collar above the barrel.

F. Collars should not be located closer than 2 feet to a pipe joint.

G. See Plate 1.26m for details of the anti-seep collar.

XII. Anchoring the Principal Spillway

A. The principal spillway must be firmly anchored to prevent its floating.

B. If the riser is over 10 feet in height, the forces acting on the spillway must be calculated. A method of anchoring the spillway which provides a safety factor of 1.25 must be used (downward forces = 1.25 x upward forces).

C. If the riser is 10 feet or less in height, choose one of the two methods in Plate 1.25n to anchor the principal spillway.

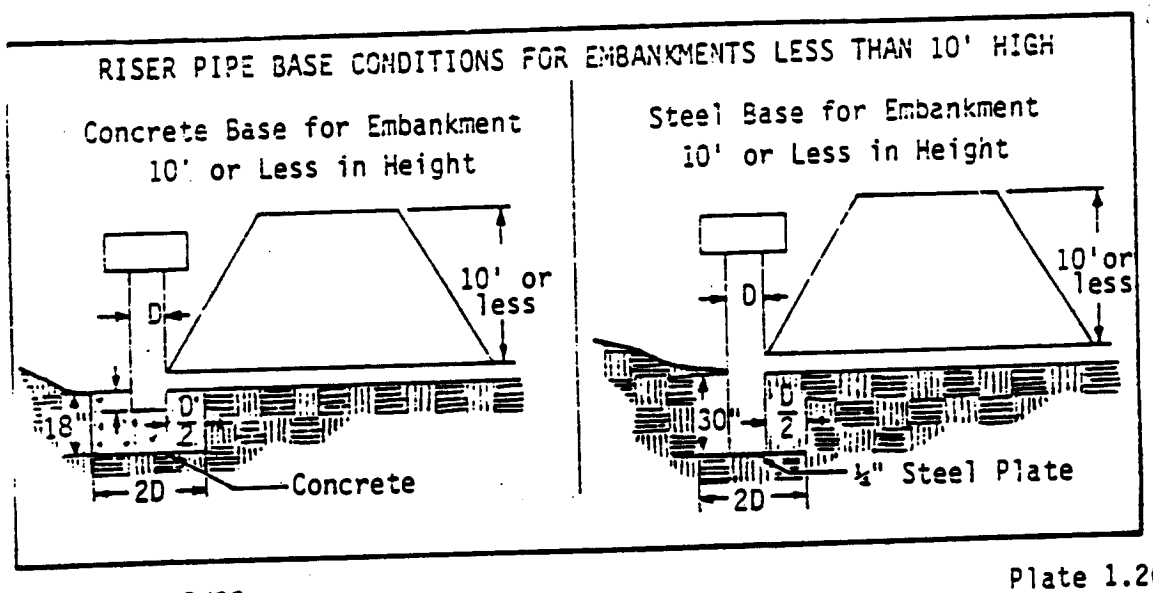


Plate 1.26n

Source: Va SWCC

XIII. Dewatering

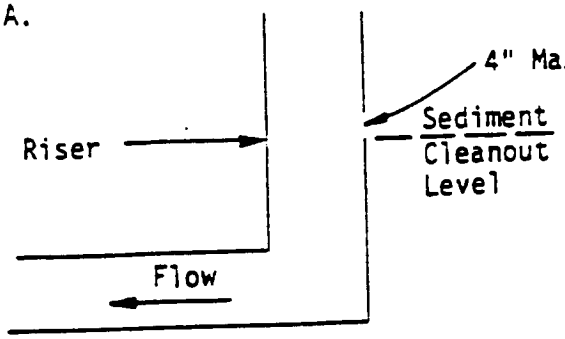
A. Refer to Plates 1.26o-1.26p. Choose one method to dewater the basin. Plate 1.26o shows methods to dewater the basin down to the sediment cleanout level. Plate 1.26p shows a method to dewater the sediment.

METHODS OF DEWATERING SEDIMENT BASIN DETENTION POOLS

Methods

Comments

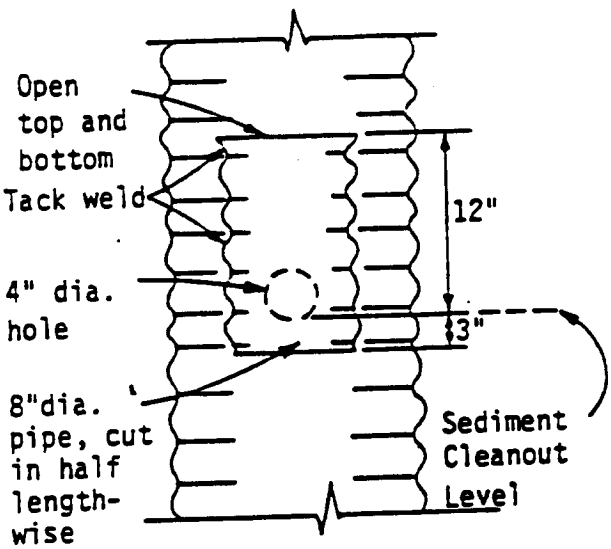
A.



Cross-Section

Easy to construct
May clog with trash
Non-skimming
Capable of draining down to sediment clean-out level
Passes base flow with-out storage of water

B. Same as "A" except for skimming device, detailed below:



Elevation

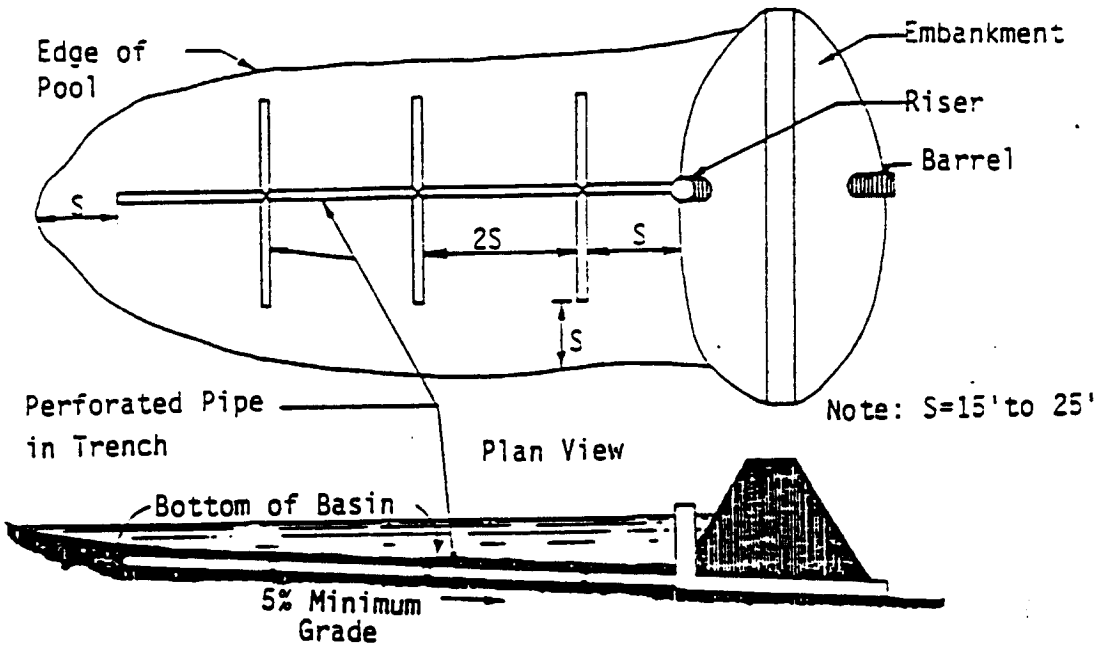
Efficient skimmer
Non-clogging
Fairly easy to construct
Capable of draining down to sediment clean-out level
Passes base flow without storage of water

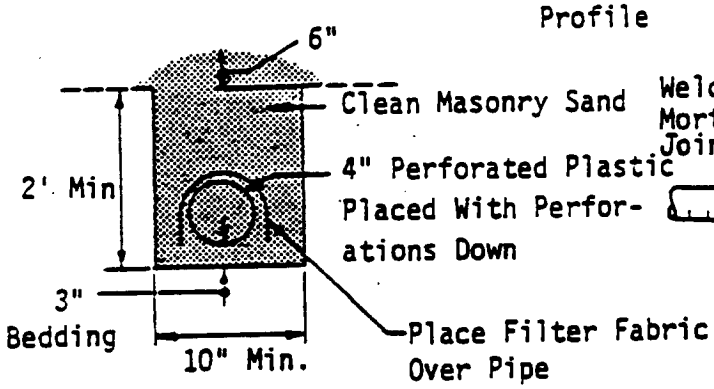
Plate 1.26o

Source: USDA-SCS

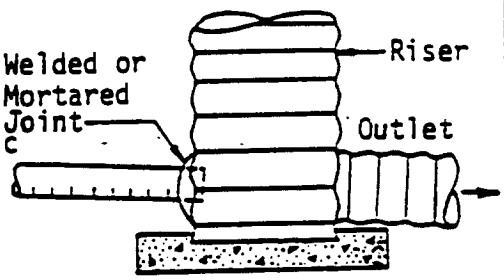
R0071414

DEWATERING SEDIMENT BASIN WITH SUBSURFACE DRAIN





Cross-Section
Drain Pipe In Trench



Riser Connection

Source: USDA-SCS

Plate 1.26 p

R0071415

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

Computed by_____Date_____
Checked by_____Date_____

Project_____

Basin# _____ Location_____

Total Area draining to basin, _____ Acres.

BASIN VOLUME DESIGN

1. Min. required vol. = 67 cu. yds. x_____ ac. drainage = _____ cu.yds.
2. Vol. of basin = _____ cu.yds.
3. Excavated _____ cu. yds. to obtain required capacity.
   Min. vol. before cleanout = 27 cu. yds. x_____ ac. drainage = cu.yds.
   Elevation corresponding to scheduled time to clean out _____
   Distance below top of riser _____.

BASIN SHAPE

4. L/We = _____ Baffles needed? No____, Yes ___; show location on site plan.

DESIGN OF SPILLWAYS

Runoff

5. Q_{10} = _____ cfs (see chapter 5).

Pipe Spillway (Q_p)

6. Min. pipe spillway capacity, Q_p = 0.2 x _____ ac. drainage = _____cfs.
   Note: If there is no emergency spillway, then req'd Q_p = Q_{10} = _____ cfs.
7. Riser: Diam. _____inches; Height_____ft.; h = _____ ft.
8. H = _____ft. Barrel length = _____ ft.
9. Barrel: Diam. _____ inches;
10. Trash Rack: Diam._____ inches; A = _____ inches.

Emergency Spillway Design

11. Emergency Spillway Flow, Q_e = Q_{10} - Q_p = _____-_____ cfs.
12. Width_____ ft. H_p _____ ft.
    Entrance channel slope _____%
    Exit channel slope _____%

ANTI-SEEP COLLAR DESIGN (IF REQUIRED)

13. y = _____ft.; z = _____:1; pipe slope = _____%, L_s = _____ ft.
    # of collars = _____ Dimensions = _____

DESIGN ELEVATIONS

14. Riser Crest = _____ Design High Water = _____
    Em. Spwy. Crest = _____ Top of Dam = _____

R0071416

ES BMP 1.30

TEMPORARY SLOPE DRAIN

Definition

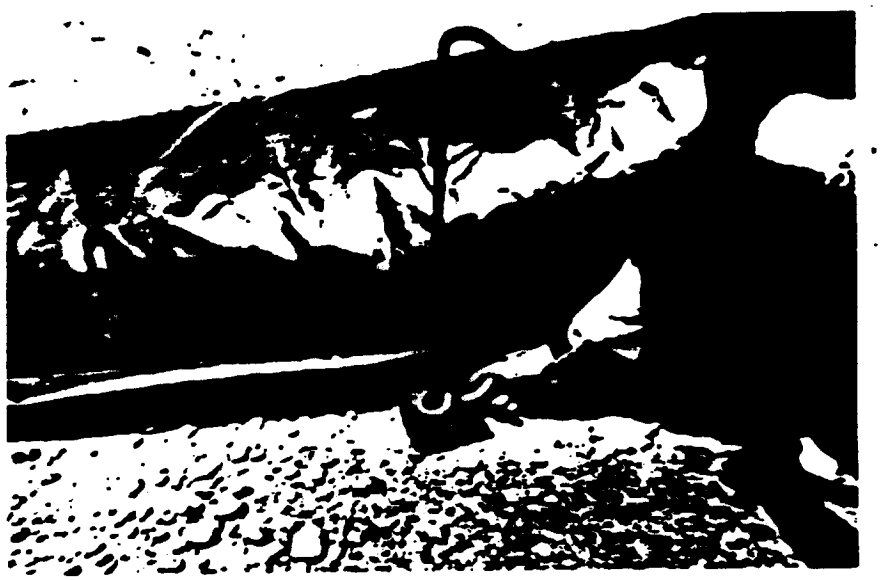
A flexible tubing or conduit extending from the top to the bottom of a cut or fill slope.

Purpose

To temporarily conduct concentrated stormwater runoff safely down the face of a cut or fill slope without causing erosion problems on or below the slope.

Conditions Where Practice Applies

On cut or fill slopes before permanent stormwater drainage structures are installed.



R0071417

Planning Considerations

There is often a significant lag between the time a cut or fill slope is completed and the time a permanent drainage system can be installed. During this period, the slope is usually not stabilized and is particularly vulnerable to erosion. This situation also occurs on slope construction which is temporarily delayed before final grade is reached. Temporary slope drains can provide valuable protection of exposed slopes until permanent drainage structures can be installed.

When used in conjunction with diversion dikes, temporary slope drains can be used to convey stormwater from the entire drainage area above a slope to the base of the slope without erosion. It is very important that these temporary structures be installed properly since their failure will often result in severe gully erosion. The entrance section must be securely entrenched, all connections must be watertight, and the conduit must be staked securely.

Design Criteria

Drainage Area

The maximum allowable drainage area per drain is 5 acres.

Flexible Conduit

1. The slope drain shall consist of heavy duty flexible material designed for this purpose. The diameter of the slope drain shall be equal over its entire length. Reinforced hold-down grommets shall be spaced at 10-foot (or less) intervals.

2. Slope drains shall be sized according to the following table:

Table 1.30a

SIZE OF SLOPE DRAIN

Maximum Drainage Area (Acres)	Pipe Diameter, D (in.)
0.5	12
1.5	18
2.5	21
3.5	24
5.0	30

Source: Va SWCC

Entrance Sections

The entrance to the slope drain shall consist of a Standard FDOT "Flared End- Section for Metal Pipe Culverts." Extension collars shall consist of 12-inch long corrugated metal pipe. Watertight fittings shall be provided. (See Plate 1.30b).

Dike Design

1. An earthen dike shall be used to direct stormwater runoff into the temporary slope drain and shall be constructed according to the practice entitled DIVERSION (ES BMP 1.18). (Plate 1.30a).

2. The height of the dike at the centerline of the inlet shall be equal to the diameter of the pipe (D) plus 6 inches. Where the dike height is greater than 18 inches at the inlet, it shall be sloped at the rate of 3:1 or flatter to connect with the remainder of the dike. (Plate 1.30a).

Outlet Protection

The outlet of the slope drain shall be protected from erosion according to the practice entitled OUTLET PROTECTION (ES BMP 1.36).

Construction Specifications

1. The measure shall be placed on undisturbed soil or well-compacted fill.

2. The entrance section shall slope toward the slope drain at the minimum rate of 1/2-inch per foot.

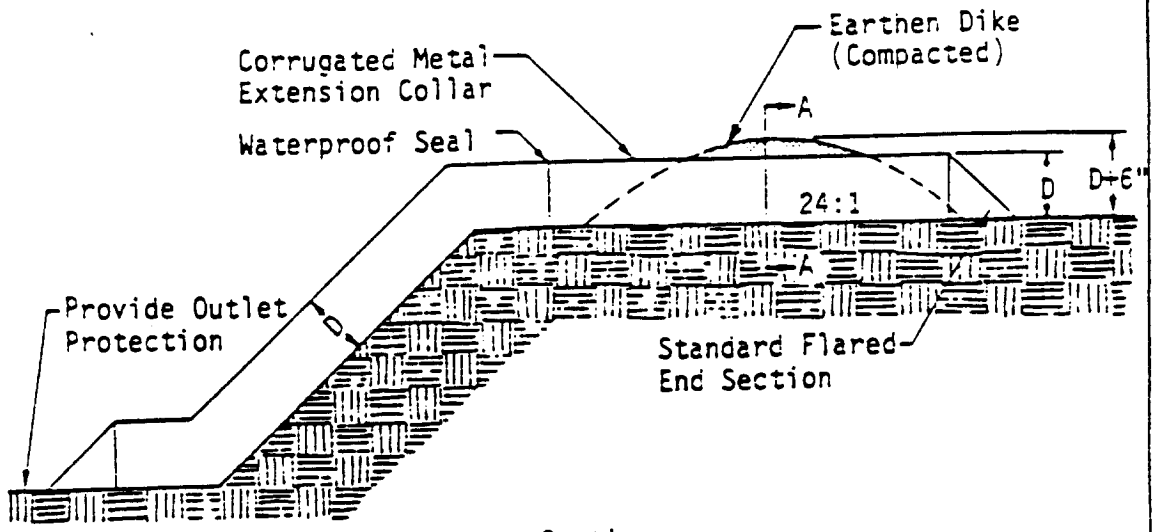
3. The soil around and under the entrance section shall be hand-tamped in 8-inch lifts to the top of the dike to prevent piping failure around the inlet.

4. The slope drain shall be securely staked to the slope at the grommets provided.

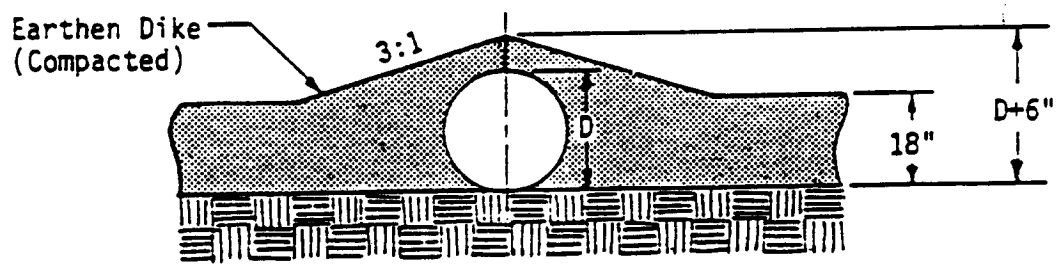
5. The slope drain sections shall be securely fastened together and have watertight fittings.

Maintenance

The slope drain structure shall be inspected weekly and after every storm and repairs made if necessary. The contractor should avoid the placement of any material on and prevent construction traffic across the slope drain.



Section



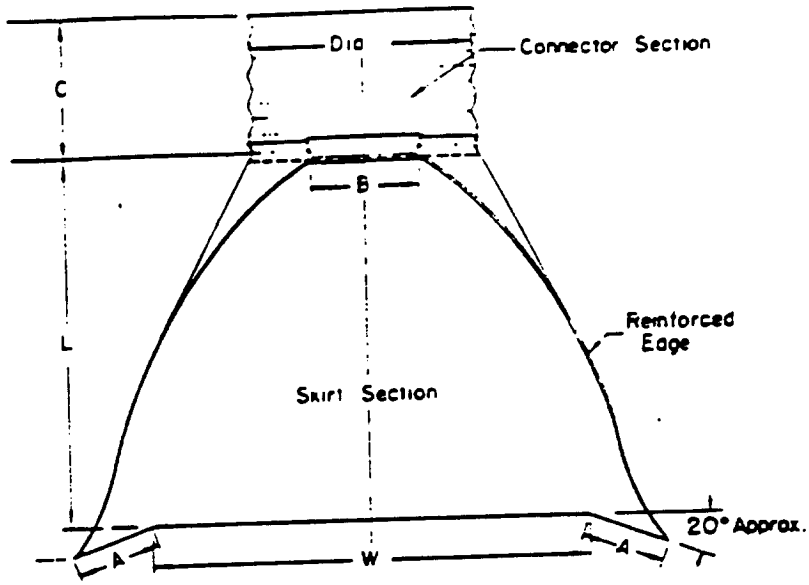
Section A-A

TEMPORARY SLOPE DRAIN

Source: Va SWCC

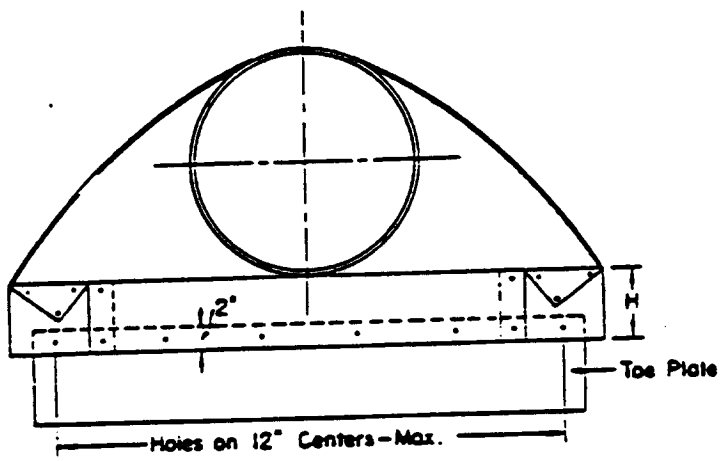
Plate 1.30 a

R0071420



Plan

Where Flared End-Sections are to be used with bituminous coated and paved metal pipe, they are to be galvanized only.



Elevation

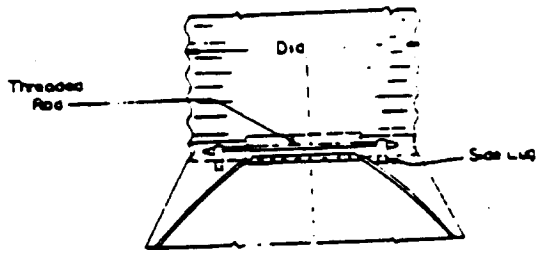
FLARED END-SECTION

Source: VDH&T Road Designs and Standards

Plate 1.30b

R0071421

Alternate Connection



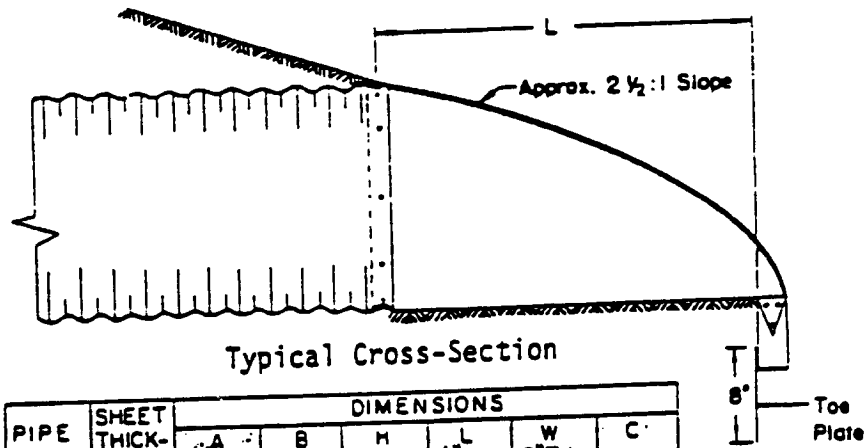
Toe plate, where needed, to be punched to match holes in skirt lip. 3/8" galv bolts to be furnished. Length of toe plate is W + 10" for 12" to 30" dia. pipe and W + 22" for 36" to 60" dia. pipe.

Skirt Section for 12" to 30" dia pipe to be made in one piece.

Skirt Section for 36" to 54" dia pipe may be made from two sheets joined by riveting or bolting on center line. 60" may be constructed in 3 pieces.

Connector Section, Corner Plate and Toe Plate to be same sheet thickness as skirt.

End-sections and fittings are to be galvanized steel or aluminum alloy for use with like pipe.



Typical Cross-Section

PIPE DIA	SHEET THICK-NESS	DIMENSIONS A ±1" Tol	B Max	H ±1" Tol	L ±1½" Tol	W ±2" Tol	C
12"	.064"	6"	6"	6"	21"	24"	24"
15"	.064"	7"	8"	6"	26"	30"	24"
18"	.064"	8"	10"	6"	31"	36"	24"
24"	.064"	10"	13"	6"	41"	48"	24"
30"	.079"	12"	16"	8"	51"	60"	24"
36"	.079"	14"	19"	9"	60"	72"	36"
42"	.109"	16"	22"	11"	69"	84"	36"
48"	.109"	18"	27"	12"	78"	90"	24"
54"	.109"	18"	30"	12"	84"	102"	36"
60"	.109"	18"	33"	12"	87"	114"	36"

FLARED END-SECTION
(Continued)

Source: VDH&T Road Designs and Standards

Plate 1.30 c

R0071422

ES BMP 1.31

PAVED FLUME

Definition

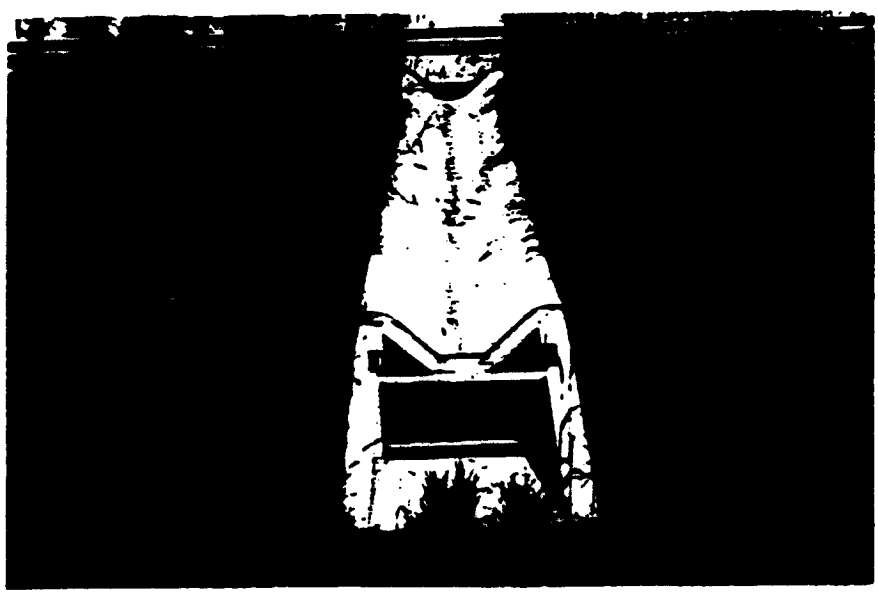
A permanent concrete-lined channel constructed on a slope.

Purpose

To conduct stormwater runoff safely down the face of a slope without causing erosion problems on or below the slope.

Conditions Where Practice Applies

Wherever concentrated stormwater runoff must be conveyed from the top to the bottom of cut or fill slopes on a permanent basis.



R0071423

Planning Considerations

Paved flumes are used routinely on highway cuts and fills to convey concentrated stormwater runoff from the top to the bottom of a slope without erosion. The Virginia Department of Highways and Transportation (VDH&T) has developed standards and specifications for these structures. Fortunately these structures have equal applicability to cut and fill slopes for construction projects other than highways.

Design Criteria

Design criteria and construction specifications contained herein are extracted and summarized from the following VDH&T publications:

Road Designs and Standards (76)
Road and Bridge Specifications (75)
Drainage Manual (73)

Handbook users should refer to the above publications for additional information or clarification if needed.

Capacity

Paved flumes shall be capable of passing the peak flow expected from a 10-year frequency storm.

Cross-Sections

Plate 1.31a illustrates a typical trapezoidal cross-section of a VDH&T "Standard Paved Flume (PG-4)." Where additional flow capacity is required, larger trapezoidal cross-sections may be designed. The following criteria apply to all trapezoidal flume designs:

1. The maximum slope of the structure shall be 1.5:1 (67%).

2. Curtain Walls shall be provided at the beginning and end of all paved flumes not abutted to another structure. The curtain wall shall be as wide as the flume channel, extend at least 18 inches into the soil below the channel, and have a thickness of 6 inches. Curtain walls shall be reinforced with #4 reinforcing steel bars placed on 6-inch centers. (See Plate 1.31a).

R0071424

3. Anchor Lugs shall be spaced at a maximum of 10 feet on center for the length of the flume. Where no curtain wall is required, an anchor lug shall be constructed within 2 feet of the end of the flume. Anchor lugs are to be as wide as the bottom of the flume channel, extend at least 1 foot into the soil below the channel, and have a thickness of 6 inches. Anchor lugs shall be reinforced with #4 reinforcing steel bars placed on 4-inch centers. (See Plate 1.31a).

4. The flume channel shall have at least a 4-inch thickness of class A-3 concrete with welded wire fabric (6 x 6 - W2.1 x W2.1) in the center for reinforcement. (See Plate 1.31a).

5. Expansion Joints shall be provided approximately every 90 feet. Eighteen-inch dowels of #4 reinforcing steel placed on 5-inch centers shall be located at all required joints. (See Plate 1.31a).

Outlet

Outlets of paved flumes shall be protected from erosion. In addition to OUTLET PROTECTION (ES BMP 1.36), each paved flume should be provided with a VDH&T "Standard Energy Dissipator." Plates 1.31b and 1.31c show a "Standard Energy Dissipator (EG-1)" which is designed for use in conjunction with a "Standard Paved Flume (PG-4)." Larger energy dissipators may be similarly designed for larger flume cross-sections.

Construction Specifications

1. The subgrade shall be constructed to the required elevations. All soft sections and unsuitable material shall be removed and replaced with suitable material. The subgrade shall be thoroughly compacted and shaped to a smooth, uniform surface. For Portland cement, the subgrade shall be moist at the time the concrete is poured.

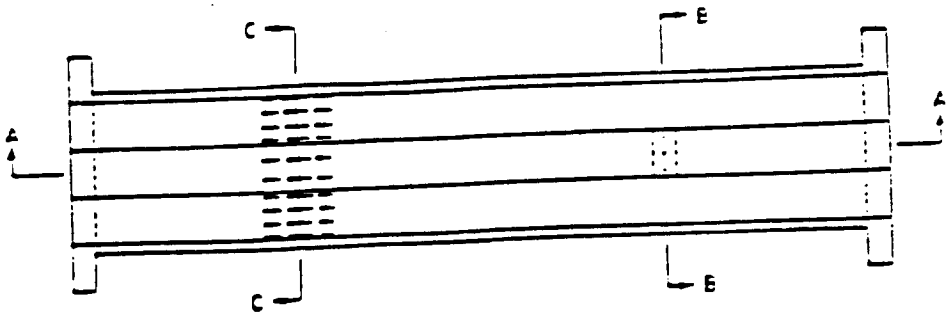
2. Anchor lugs and curtain walls shall be formed to be continuous with the channel lining.

3. Traverse joints for crack control should be provided at approximately 20-foot intervals and when more than 45 minutes elapses between consecutive concrete placements. All sections should be at least 6 feet long. Crack control joints may be formed by using a 1/8-inch thick removable template, by scoring or sawing to a depth of at least 3/4 inch or by an approved "leave-in" type insert.

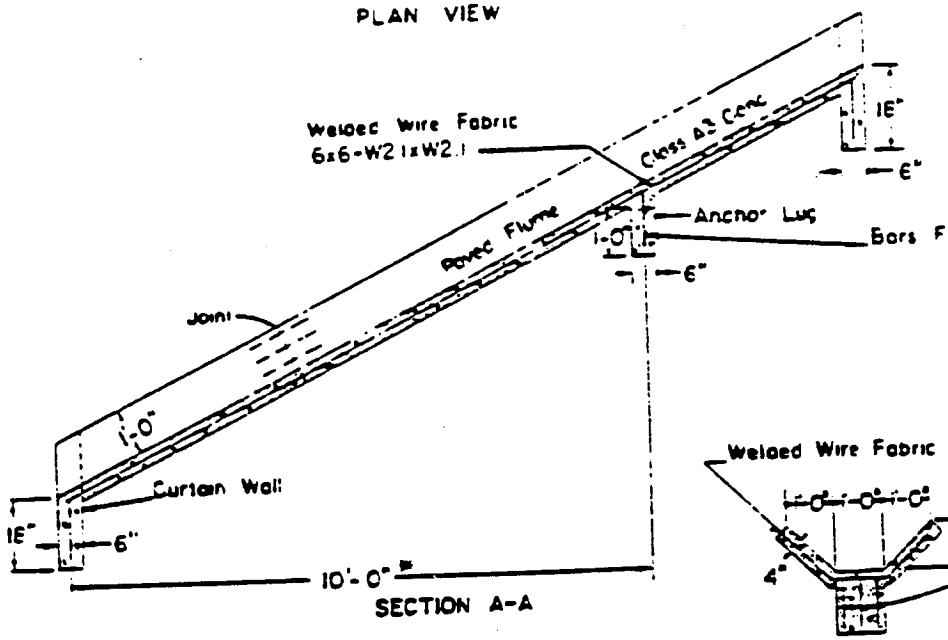
Maintenance

Before permanent stabilization of the slope, the structure should be inspected after each rainfall and damages to the slope or paved flume repaired immediately. After the slope is stabilized, little maintenance should be required.

R0071425



PLAN VIEW



SECTION A-A

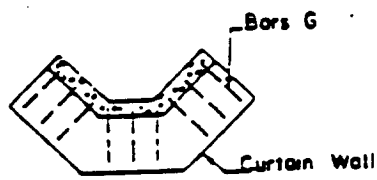
SECTION E-E

* 10'-0" C-C maximum typical spacing between Anchor Lugs. Where Curtain Wall is not required Anchor Lug is to be a maximum of 2' from end of channel

SCHEDULE OF REINFORCING STEEL

MARK	NO.	LENGTH 2	LENGTH Key	SIZE	SPACING C-C	SHAPE
F	3	1'-2"	1'-2"	4	4"	Straight
G	9	1'-5"	1'-5"	4	6"	Straight
Dowels	10	1'-6"	1'-6"	4	6"	Straight

Dec. shown are for one anchor lug, curtain wall and joint



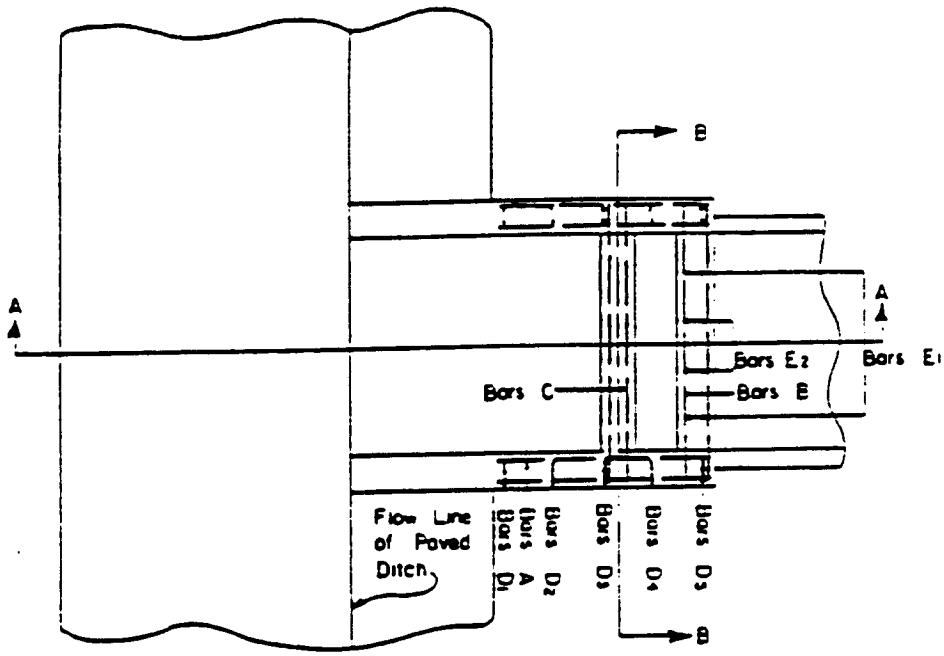
SECTION C-C

PAVED FLUME

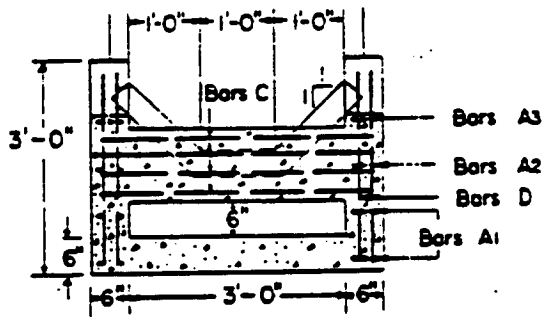
Plate 1.31a

Source: VDH&T Road Designs and Standards

R0071426



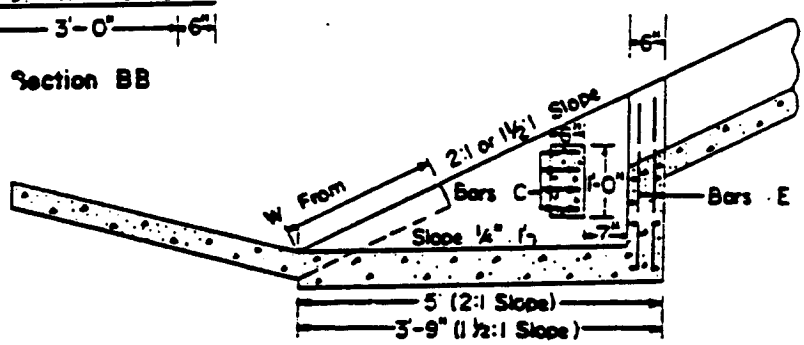
PLAN VIEW



Section BB

This item may be precast or cast in place.

Concrete to be Class A3 if cast in place, Class A4 if precast.



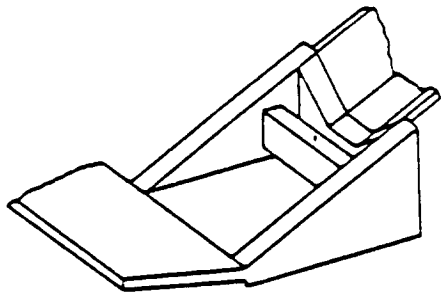
Section AA

ENERGY DISSIPATOR

Source: VDH&T Road Designs and Standards

Plate 1.31b

R0071427



Isometric

SCHEDULE OF REINFORCING STEEL

MARK	NO.	LENGTH 2:1	LENGTH 1½:1	SIZE	SPACING C-C	SHAPE
A1	8	2'-10"	2'-10"	3	8"	Straight
A2	4	2'-6¼"	1'-10"	3	8"	Straight
A3	4	1'-0¾"	0'-10"	3	8"	Straight
B	6	3'-9"	3'-9"	3	8"	Straight
C	8	3'-8"	3'-8"	4	2½"	Straight
D1	4	1'-2½"	0'-8"	3	8"	Straight
D2	4	1'-6½"	1'-1½"	3	8"	Straight
D3	4	1'-10½"	1'-7"	3	8"	Straight
D4	4	2'-2½"	2'-0½"	3	8"	Straight
D5	4	2'-6½"	2'-6"	3	8"	Straight
E1	4	1'-11½"	1'-11½"	3	8"	Straight
E2	4	1'-5½"	1'-5½"	3	8"	Straight

APPROXIMATE QUANTITIES

		Concrete	Reinforcing Steel
		Cu. Yds.	Lbs.
Energy Dissipator	2:1	0.7479	61.20
	1½:1	0.5921	57.63

ENERGY DISSIPATOR
(Continued)

Source: VDH&T Road Designs and Standards

Plate 1.31c

R0071428

ES BMP 1.35

STORMWATER CONVEYANCE CHANNEL

Definition

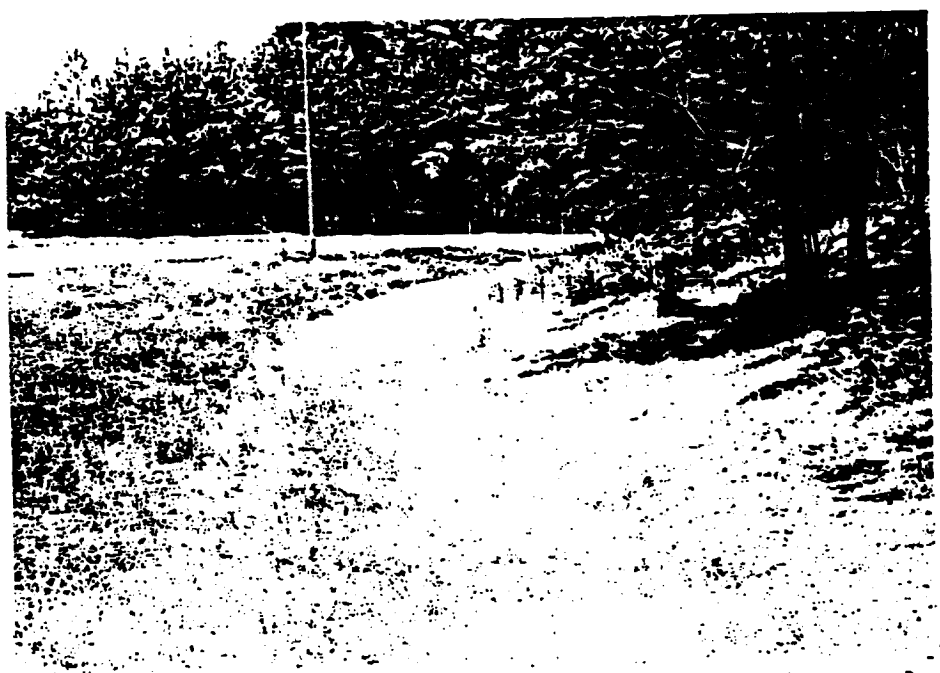
A permanent, designed waterway, shaped and lined with appropriate vegetation or structural material to safely convey excess stormwater runoff away from a developing area.

Purpose

To provide for the conveyance of concentrated surface runoff water without damage from erosion.

Conditions Where Practice Applies

Generally applicable to man-made channels, including roadside ditches, and intermittent natural channels that are modified to accommodate increased flows generated by land development. This practice is not applicable to major, continuous flowing natural streams.



Grass Lined Channel Transition to Concrete Lined Channel

R0071429

Planning Considerations

The design of a channel cross-section and lining is based primarily upon the volume and velocity of flow expected in the channel. If conditions are appropriate, vegetated or riprap channels are generally preferred over concrete. While concrete channels are efficient and easy to maintain, they remove runoff so quickly that channel erosion, flooding and pollution often result downstream. Stormwater conveyance channels that do not provide treatment as required by Chapter 17-25, F.A.C. will require treatment facilities before discharging to state waters.

Besides the primary design considerations of capacity and velocity, a number of other important factors should be taken into account when selecting a cross-section and lining. These factors include land availability, compatibility with land use and surrounding environment, safety, maintenance requirements, outlet conditions and stormwater treatment capability. For these reasons SWALES (see SW BMP 3.04) are the preferred means of conveying stormwater since they provide treatment of pollutants and allow infiltration.

Vee-Shaped ditches are generally used where the quantity of water to be handled is relatively small, such as along roadsides. A grass or sod lining will suffice where velocities in the ditch are low. For steeper slopes where high velocities are encountered, a concrete or bituminous concrete lining may be appropriate.

Parabolic channels are often used where the quantity of water to be handled is larger and where space is available for a wide, shallow channel with low velocity flow. Riprap should be used where higher velocities are expected and where some dissipation of energy (velocity) is desired. Combinations of grass and riprap are also useful where there is a continuous low flow in the channel.

Trapezoidal channels are often used where the quantity of water to be carried is large and conditions require that it be carried at a relatively high velocity. Trapezoidal ditches are generally lined with concrete or riprap.

Outlet conditions for all channels should be considered. This is particularly important for the transition from a man-made lining such as concrete to a vegetative lining. Appropriate measures must be taken to dissipate the energy of the flow to prevent scour of the receiving channel. (See OUTLET PROTECTION, ES BMP 1.36).

Design Criteria

Capacity

Unless otherwise specified in local or state stormwater criteria, all channels shall be designed to contain at least the peak flow from a 10 year frequency storm. If channel flooding will cause inconvenience or property damage, the minimum channel capacity should be increased to carry at least 25 year frequency storm. Where the consequences of channel flooding are "severe", the capacity of the channel should be increased accordingly.

Velocity

Channels shall be designed so that the velocity of flow expected from a 10 year frequency storm shall not exceed the permissible velocity for the type of lining used.

Grass-lined channels: Permissible velocities for grass-lined channels are shown in Table I.35a.

Riprap-lined channels: Riprap linings can be designed to withstand most flow velocities by choosing a stable stone size. The procedure for selecting a stable stone size for channels is contained in ES BMP 1.37, RIPRAP.

Concrete-lined channels: Velocity is usually not a limiting factor in the design of concrete-lined channels; however, it should be kept in mind that the flow velocity at the outlet of the paved section must not exceed the permissible velocity of the receiving channel. The outlet must also be stabilized to prevent erosion and scour. It may require energy dissipaters.

Depth

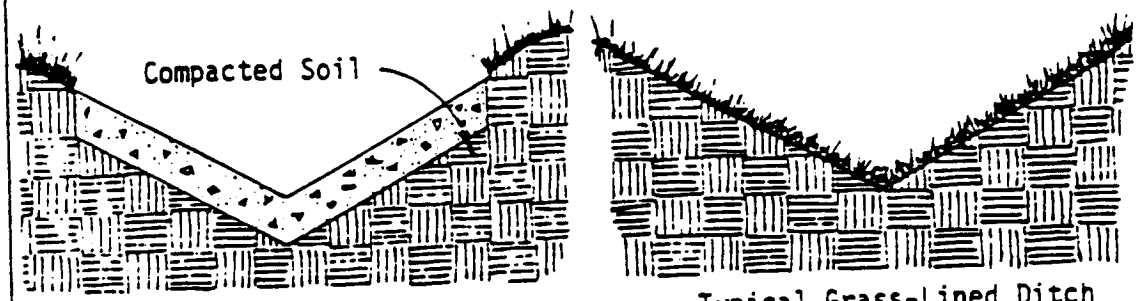
The design water surface elevation of a channel receiving water from diversions or other tributary channels shall be equal to or less than the design water surface elevation of the diversion or other tributary channel at the point of intersection.

Cross-Sections

1) Channel cross-sections may be vee-shaped, parabolic or trapezoidal. Typical vee-shaped, parabolic and trapezoidal cross-sections are shown in Plate 1.35a. Parabolic cross-sections are closest to that of natural channels. Trapezoidal cross-sections tend to revert to the parabolic shape with time.

2) The top width of parabolic and vee-shaped, grass-lined channels shall not exceed 30 feet, and the bottom width of trapezoidal, grass-lined channels shall not exceed 15 feet unless multiple or divided waterways, riprap center, or other means are provided to control meandering of low flows.

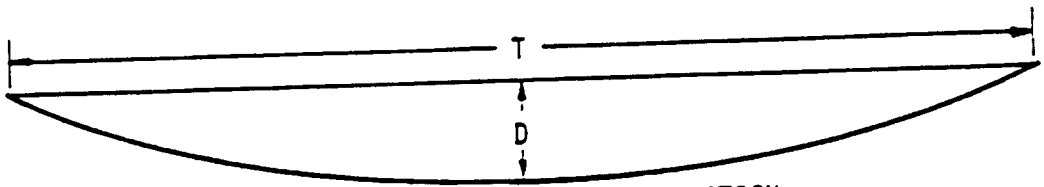
TYPICAL WATERWAY CROSS-SECTIONS



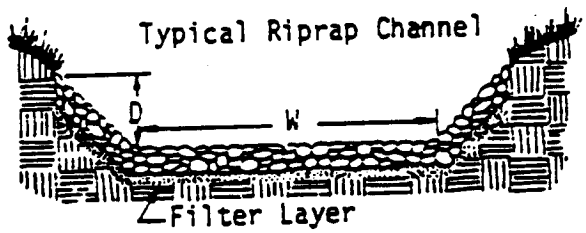
Typical Concrete-Lined Ditch

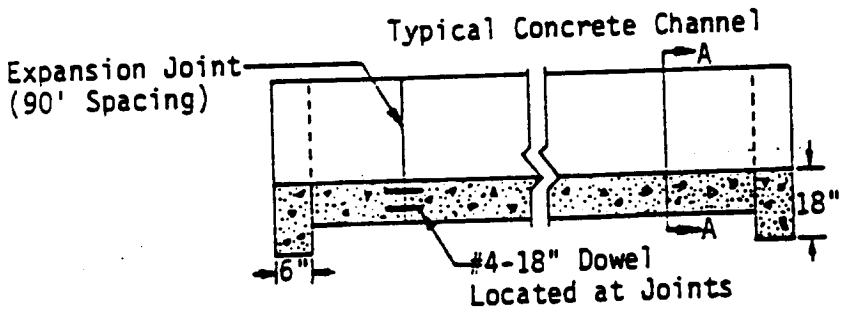
Typical Grass-Lined Ditch

TYPICAL VEE CROSS-SECTIONS

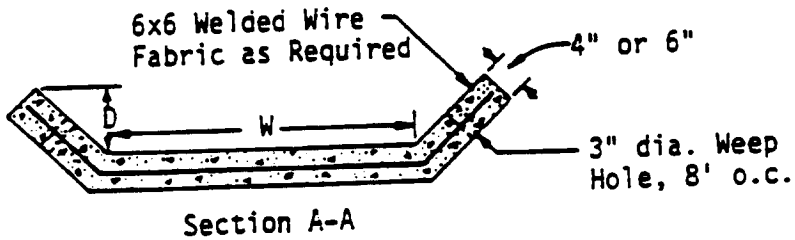


PARABOLIC WATERWAY CROSS-SECTION





Not to Scale



Section A-A

TRAPEZOIDAL WATERWAY CROSS-SECTIONS

Plate 1.35a

Source: Va SWCC

R0071432

Table 1.35a

PERMISSIBLE VELOCITIES GRASS-LINED CHANNELS

CHANNEL SLOPE	LINING	PERMISSIBLE VELOCITY*
0-5%	Bermudagrass	6 ft/sec
	Bahia	5 ft/sec
	Bluestem (broomsedges)	5 ft/sec
	Grass-legume mixture	4 ft/sec
	Sericea lespedeza	2.5 ft/sec
	Annual lespedeza	2.5 ft/sec
	Small grains (temporary)	2.5 ft/sec
5-10%	Bermudagrass	5 ft/sec
	Bahia	4 ft/sec
	Bluestem (broomsedges)	4 ft/sec
	Grass-legume mixture	3 ft/sec

For highly erodible soils, permissible velocities should be decreased 25%. An erodibility factor (K) greater than 35 would indicate a highly erodible soil. Erodibility factors (K-factors) for many Florida soils are listed in Appendix 2-4 of this manual.

Channel Linings

Grass: The type of grass chosen shall be appropriate for the site conditions; i.e., drainage tolerance, shade tolerance, maintenance requirements, permissible velocities, slope and soil type. (See PERMANENT SEEDING, ES BMP 1.66).

Riprap: Riprap shall meet the design criteria set forth in RIPRAP, ES BMP 1.37.

Concrete: Concrete channels shall be at least four inches thick and meet applicable FDOT criteria.

R0071433

Drainage (grass-lined channels)

Where there will be a base flow in grass-lined channels, a stone center, a subsurface, or other suitable means of handle the base flow shall be provided. Plate 1.35b shows typical cross-sections for stone center channels. Refer to RIPRAP, ES BMP 1.37 to choose the correct stone size.

Outlet

The outlets of all channels shall be protected from erosion. (See OUTLET PROTECTION, ES BMP 1.36).

Calculations

1) Peak runoff shall be calculated in accordance with the guidelines contained in Chapter 5 of this manual.

2) Channel dimensions for roadside ditches and median channels shall be determined in accordance with applicable design procedures outlined in the FDOT Drainage Manual. Helpful design charts are also included in that publication to aid in the design of concrete-lined channels for many cross-sectional shapes.

3) Channel dimensions for parabolic, grass-lined channels may be determined from the tables in Appendix 6-4.

4) A general "trial and error" procedure for designing channels using the Manning's Equation and Continuity Equation is contained in SWALES (SW BMP 3.04).

Construction Specifications

General

1) All trees, brush, stumps, roots, obstructions and other unsuitable materials shall be removed and properly disposed of.

2) The channel shall be excavated or shaped to the proper grade and cross-section.

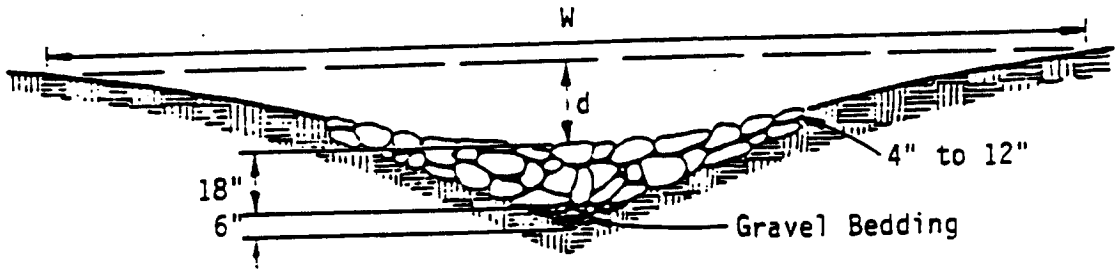
3) All fills shall be well compacted to prevent unequal settlement.

4) Any excess soil shall be removed and properly disposed of.

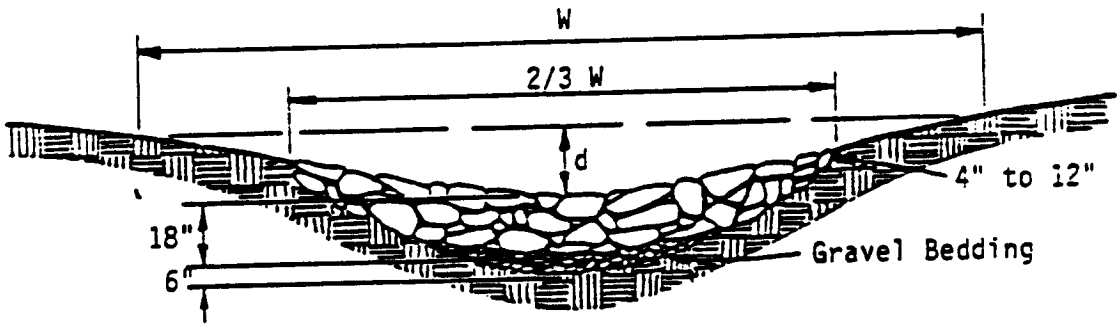
Grass-lined channels

The method used to establish grass in the ditch or channel will depend upon the severity of the conditions encountered. The methods available for grass establishment are:

STONE-LINED WATERWAYS



V-Shaped Waterway with Stone Center Drain
(Shaped by Motor Patrol)



Parabolic-Shaped Waterway with Stone Center Drain
(Shaped by Bulldozer)

Source: USDA-SCS

Plate 1.35b

R0071435

1a) Seeding with straw mulch and tack coat.
b) Sprigging with bermudagrass.
2) Seeding with straw mulch and jute mesh or erosion netting.
3) Sodding.

Consult Table 1.35b to choose the correct grass establishment technique. For each establishment technique, if any one of the four conditions is exceeded, the next establishment technique below must be used.

TABLE 1.35b

GRASS ESTABLISHMENT ALTERNATIVES

Establishment Technique	Conditions
1a) Seeding with straw mulch and tack coat. 1b) Establishing bermudagrass by sprigging.	1) Slopes less than 5%. 2) Velocity less than 3 feet per second. 3) Majority of drainage can be diverted away from channel during germination and establishment. 4) Erosion-resistant soils.
2) Seeding with straw mulch and jute mesh or erosion netting.	1) Slopes less than 5%. 2) Velocity less than 5 feet per second. 3) Majority of drainage can not be diverted away from channel during germination and establishment. 4) Moderate erodible soil.
3) Sodding	1) Slopes greater than 5%. 2) Velocity between 5 feet per second and 6 feet per second. 3) Majority of drainage can not be diverted away from channel during germination. 4) Highly erodible soil.

1a) Seeding with straw mulch and tack coat. All seeding shall be done in accordance with PERMANENT SEEDING. ES BMP 1.66. When mulching, use 2 tons/acre small grain straw with an acceptable tacking agent. Refer to MULCHING, ES BMP 1.75.

b) Bermudagrass establishment by sprigging. Establish bermudagrass in accordance with BERMUDAGRASS ESTABLISHMENT, ES BMP 1.68. Irrigation water must be available during the first 4 weeks. Divert drainage away from the channel during the first 3 weeks of the establishment period by using temporary dikes, silt fencing, or straw bale barriers.

2) Seeding with straw mulch and jute mesh or erosion netting. In addition to 1A) above, straw mulch will be secured with netting. If using jute mesh, use only 1 ton/acre small grain straw, evenly distributed. If using a light plastic or paper erosion netting, 1-1/2 to 2 tons/acre of straw is appropriate. Care should be taken to staple the mesh or netting according to specifications in MULCHING, ES BMP 1.75, Nets and Mats. Excelsior blankets, used alone, are also acceptable mulches for waterways.

3) Sodding. Sod shall be installed in accordance with SODDING, ES BMP 1.67.

Concrete-lined channels

Concrete-lined channels must be constructed in accordance with all applicable FDOT specifications. Following is a summary of those specifications provided as a guide only:

1) The subgrade should be moist at the time the concrete is poured.

2) Traverse joints for crack control should be provided at approximately 20-feet intervals and when more than 45 minutes elapses between the times of consecutive concrete placements. All sections should be at least 6 feet long. Crack control joints may be formed by using a 1/8-inch thick removable template, by scoring or sawing to a depth of at least 3/4 inch or by an approved "leave in" type insert.

3) Expansion joints shall be installed every 100 feet.

Riprap-lined channels

Riprap shall be installed in accordance with RIPRAP, ES BMP 1.37.

Maintenance

Grass-lined channels

During the initial establishment, grass-lined channels should be repaired immediately and grass re-established if necessary. After grass has become established, the channel should be checked periodically to determine if the grass is staying in place. If the channel is to be mowed, it should be done in a manner that will not damage the grass.

Riprap-lined channels

Riprap-lined channels should be checked periodically to ensure that scour does not occur beneath the riprap layer. The channel should also be checked to determine that the stones are not dislodged by the flow.

Concrete-lined channels

Concrete-lined channels should be checked periodically to ensure that there is no undermining of the channel. Particular attention should be paid to the outlet of the channel. If scour is occurring at the outlet, appropriate energy dissipation measures shall be taken.

Sediment deposition

If the channel is below a high sediment-producing area, sediment should be trapped before it enters the channel. If sediment is deposited in grass-lined channels, it should be removed promptly to prevent damage to the grass. Sediment deposited in riprap and concrete-lined channels should be removed when it reduces the capacity of the channel.

R0071438

ES BMP 1.36

OUTLET PROTECTION

Definition

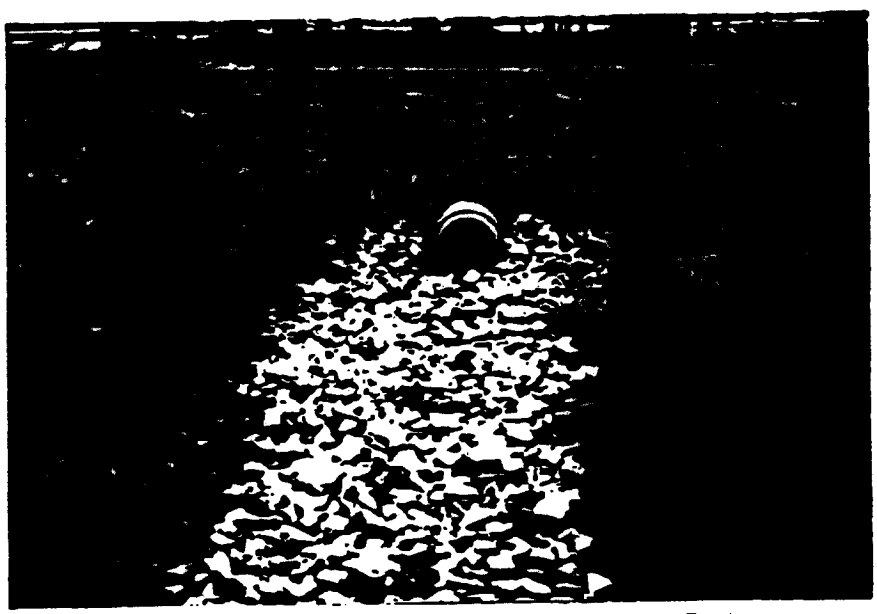
Structurally lined aprons or other acceptable energy dissipating devices placed at the outlets of pipes or paved channel sections.

Purpose

To prevent scour at stormwater outlets and to minimize the potential for downstream erosion by reducing the velocity of concentrated stormwater flows.

Conditions Where Practice Applies

Applicable to the outlets of all pipes and paved channel sections where the velocity of flow at design capacity of the outlet will exceed the permissible velocity of the receiving channel or area. (See Table 1.36a).



R0071439

Planning Considerations

The outlets of pipes and structurally lined channels are points of critical erosion potential. Stormwater which is transported through man-made conveyance systems at design capacity generally reaches a velocity which exceeds the capacity of the receiving channel or area to resist erosion. To prevent scour at stormwater outlets, a flow transition structure is needed which will absorb the initial impact of the flow and reduce the flow velocity to a level which will not erode the receiving channel or area.

The most commonly used device for outlet protection is a structurally lined apron. These aprons are generally lined with riprap, grouted riprap or concrete. They are constructed at a zero grade for a distance which is related to the outlet flow rate and the tailwater level. Criteria for designing such an apron are contained in this practice. Sample problems of outlet protection design are contained in Appendix 1.36A.

1. Hydraulic Design of Energy Dissipators for Culverts and Channels, Hydraulic Engineering Circular No. 14, U.S. Department of Transportation, Federal Highway Administration (70).

2. Hydraulic Design of Stilling Basins and Energy Dissipators, Engineering Monograph No. 25, U.S. Department of the Interior - Bureau of Reclamation (61).

3. Road Designs and Standards, Virginia Department of Highways and Transportation (76).

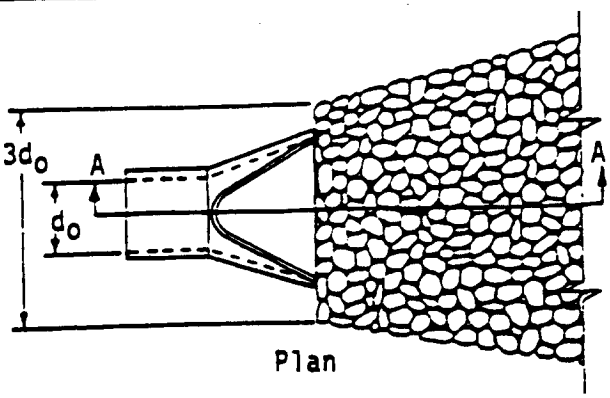
Design Criteria

Structurally lined aprons at the outlets of pipes and paved channel sections shall be designed according to the following criteria:

PIPE OUTLETS

1. Tailwater depth: The depth of tailwater immediately below the pipe outlet must be determined for the design capacity of the pipe. Manning's Equation may be used to determine tailwater depth (see Chapter 5 of this manual). If the tailwater depth is less than half the diameter of the outlet pipe, it shall be classified as a Minimum Tailwater Condition. If the tailwater depth is greater than half the pipe diameter, it shall be classified as a Maximum Tailwater Condition. Pipes which outlet onto flat areas with no defined channel may be assumed to have a Minimum Tailwater Condition.

R0071440



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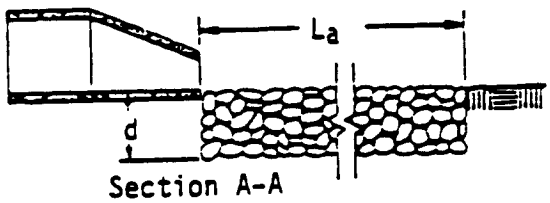
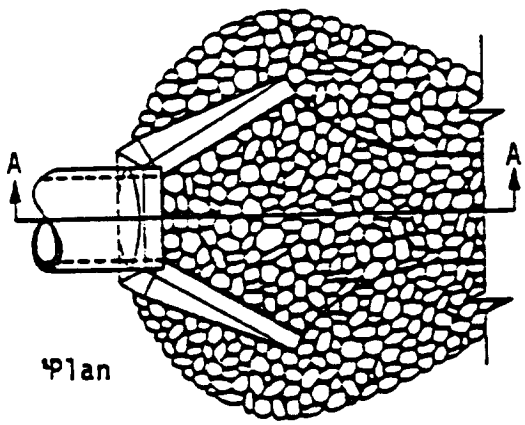


Section A-A

Pipe Outlet To Flat Area
With No Defined Channel



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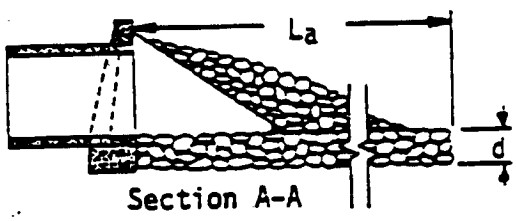


Section A-A

Pipe Outlet To Well-Defined Channel

Notes

1. Apron lining may be riprap, grouted riprap, or concrete.
2. L_a is the length of the riprap apron as calculated using Plates 1.36d and 1.36e.
3. d = 1.5 times the maximum stone diameter but not less than 6 inches.

PIPE OUTLET CONDITIONS

Source: Va SWCC

Plate 1.36a

R0071441

2. Apron length: The apron length shall be determined from the curves according to the tailwater condition:

   Minimum Tailwater - Use Plate 1.36c.

   Maximum Tailwater - Use Plate 1.36d.

3. Apron width: If the pipe discharges directly into a well-defined channel, the apron shall extend across the channel bottom and up the channel banks to an elevation one foot above the maximum tailwater depth or to the top of the bank (whichever is less).

   If the pipe discharges onto a flat area with no defined channel, the width of the apron shall be determined as follows:

   a. The upstream end of the apron, adjacent to the pipe, shall have a width three times the diameter of the outlet pipe.

   b. For a Minimum Tailwater Condition, the downstream end shall have a width equal to the pipe diameter plus the length of the apron.

   c. For a Maximum Tailwater Condition, the downstream end shall have a width equal to the pipe diameter plus 0.4 times the length of the apron.

4. Bottom grade: The apron shall be constructed with no slope along its length (0.0% grade). The invert elevation of the downstream end of the apron shall be equal to the elevation of the invert of the receiving channel. There shall be no overfall at the end of the apron.

5. Side slopes: If the pipe discharges into a well-defined channel, the side slopes of the channel shall not be steeper than 2:1 (Horizontal: Vertical).

6. Alignment: The apron shall be located so that there are no bends in the horizontal alignment.

7. Materials: The apron may be lined with riprap, grouted riprap, or concrete. The median size stone for riprap shall be determined from the curves in Appendix 1.36A (Plates 1.36c and 1.36d) according to the tailwater condition. The gradation, quality and placement of riprap shall conform to ES BMP 1.37, RIPRAP.

R0071442

Table 1.36a

PERMISSIBLE VELOCITIES GRASS-LINED CHANNELS

CHANNEL SLOPE	LINING	PERMISSIBLE VELOCITY*
0-5%	Bermudagrass	6 ft/sec
	Bahia	5 ft/sec
	Bluestem (broomsedges)	5 ft/sec
	Grass-legume mixture	4 ft/sec
	Sericea lespedeza	2.5 ft/sec
	Annual lespedeza	2.5 ft/sec
	Small grains (temporary)	2.5 ft/sec
5-10%	Bermudagrass	5 ft/sec
	Bahia	4 ft/sec
	Bluestem (broomsedges)	4 ft/sec
	Grass-legume mixture	3 ft/sec

*For highly erodible soils, decrease permissible velocities by 25%.

EARTH LININGS

Soil Types	Permissible Velocity
Fine Sand (noncolloidal)	2.5 ft/sec
Sandy Loam (noncolloidal)	2.5 ft/sec
Silt Loam (noncolloidal)	3.0 ft/sec
Ordinary Firm Loam	3.5 ft/sec
Fine Gravel	5.0 ft/sec
Stiff Clay (very colloidal)	5.0 ft/sec
Graded, Loam to Cobbles (noncolloidal)	5.0 ft/sec
Graded, Silt to Cobbles (colloidal)	5.5 ft/sec
Alluvial Silts (noncolloidal)	3.5 ft/sec
Alluvial Silts (colloidal)	5.0 ft/sec
Coarse Gravel (noncolloidal)	6.0 ft/sec
Cobbles and Shingles	5.5 ft/sec
Shales and Hard Pans	6.0 ft/sec

Source: Soil and Water Conservation Engineering, Schwab, et al., and American Society of Civil Engineers.

R0071443

PAVED CHANNEL OUTLETS
(See Plate 1.36b)

1. The flow velocity at the outlet of paved channels flowing at design capacity must not exceed the permissible velocity of the receiving channel. (See Table 1.36a).

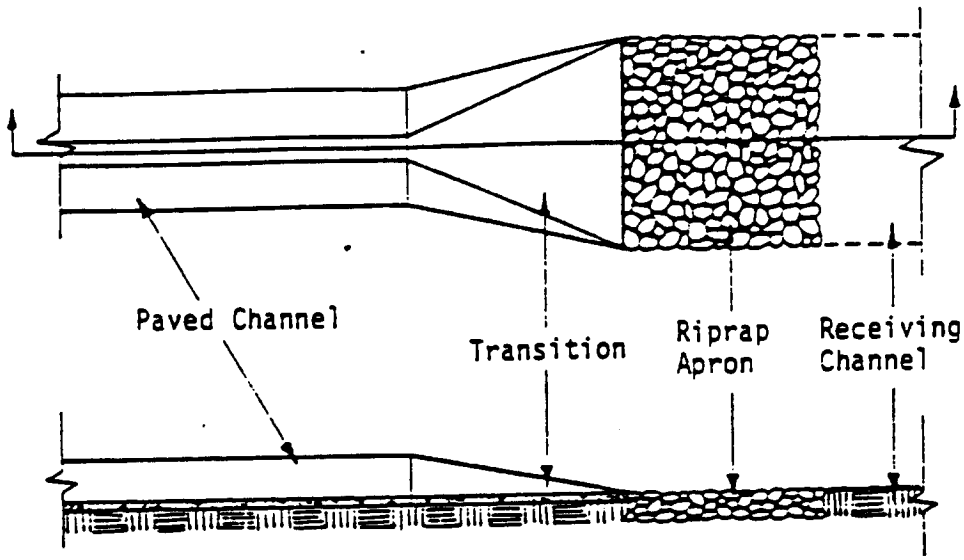
2. The end of the paved channel shall merge smoothly with the receiving channel section. There shall be no overfall at the end of the paved section. Where the bottom width of the paved channel is narrower than the bottom width of the receiving channel, a transition section shall be provided (see Plate 1.36b). The maximum side divergence of the transition shall be 1 in 3F where:

$$F = \frac{V}{\sqrt{gd}}, \text{ and}$$

F = Froude number
V = Velocity at beginning of transition (ft./sec.)
d = depth of flow at beginning of transition (ft.)
g = 32.2 ft./sec.

3. Bends or curves in the horizontal alignment of the transition are not allowed unless the Froude number (F) is 1.0 or less, or the section is specifically designed for turbulent flow.

R0071444



Notes

1. Riprap apron reduces the flow velocity below the permissible velocity of the natural receiving channel.
2. Transition side divergence is 1 in 3F, where

   F = Froude Number = $\frac{V}{\sqrt{gd}}$, where

   V = Velocity at the beginning of the transition

   d = Depth of flow at the beginning of the transition

   g = 32.2 ft./sec.^{2}

PAVED CHANNEL OUTLET

Source: Va SWCC

Plate 1.36b

R0071445

APPENDIX 1.36A

Sample Problems
Outlet Protection Design

Example 1

Given: An 18-inch pipe discharge 24 ft.^{3}/sec. at design capacity onto a grassy slope (no defined channel).

Find: The required length, width and median stone size (d_{50}) for a riprap-lined apron.

Solution:
1. Since the pipe discharges onto a grassy slope with no defined channel, a Minimum Tailwater Condition may be assumed.
2. From Plate 1.36c, an apron length (L_a) of 20 feet and a median stone size (d_{50}) of 0.8 ft are determined.
3. The upstream apron width equals three times the pipe diameter; 3 x 1.5 ft. = 4.5 ft.
4. The downstream apron width equals the apron length plus the pipe diameter; 20 ft. + 1.5 ft. = 21.5 ft.

Example 2

Given: The pipe in example No. 1 discharges into a channel with a triangular cross-section, 2 feet deep and 2:1 side slopes. The channel has a 2% slope and an "n" factor of .045.

Find: The required length, width and the median stone size (d_{50}) for a riprap lining.

Solution:
1. Determine the tailwater depth using Manning's Equation.

$$Q = \frac{1.49}{n} R^{2/3} S^{1/2} A$$

$$24 = \frac{1.49}{.045} \left(\frac{2d}{2\sqrt{2^2 + 1}} \right)^{2/3} (.02)^{1/2} (2d^2)$$

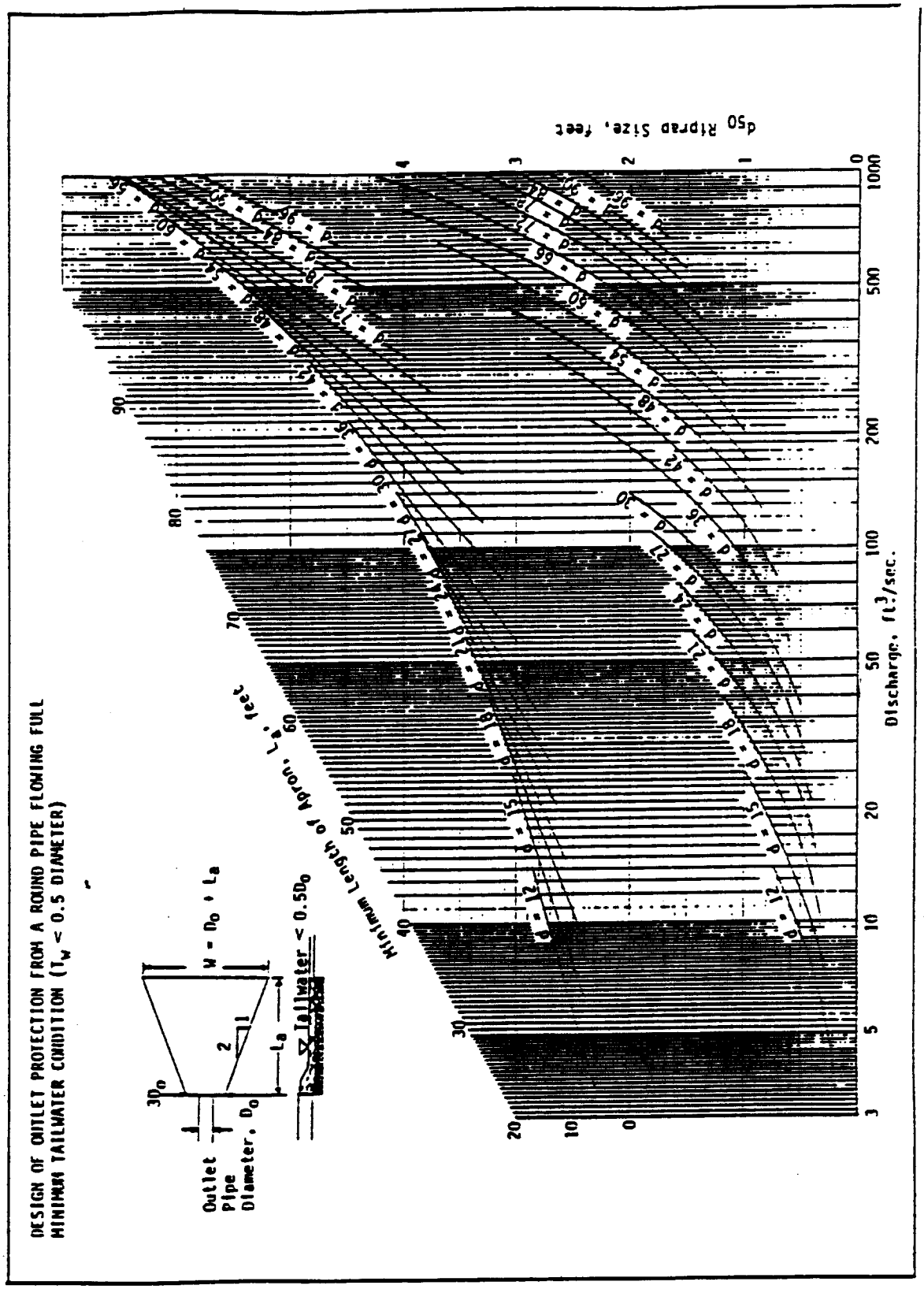
where,

d = depth of tailwater
d = 1.74 ft.*

*Since d is greater than half the pipe diameter, a Maximum Tailwater Condition exists.

2. From Plate 1.36d, a median stone size (d_{50}) of 0.5 ft. and an apron length of (L_a) of 41 ft. is determined.

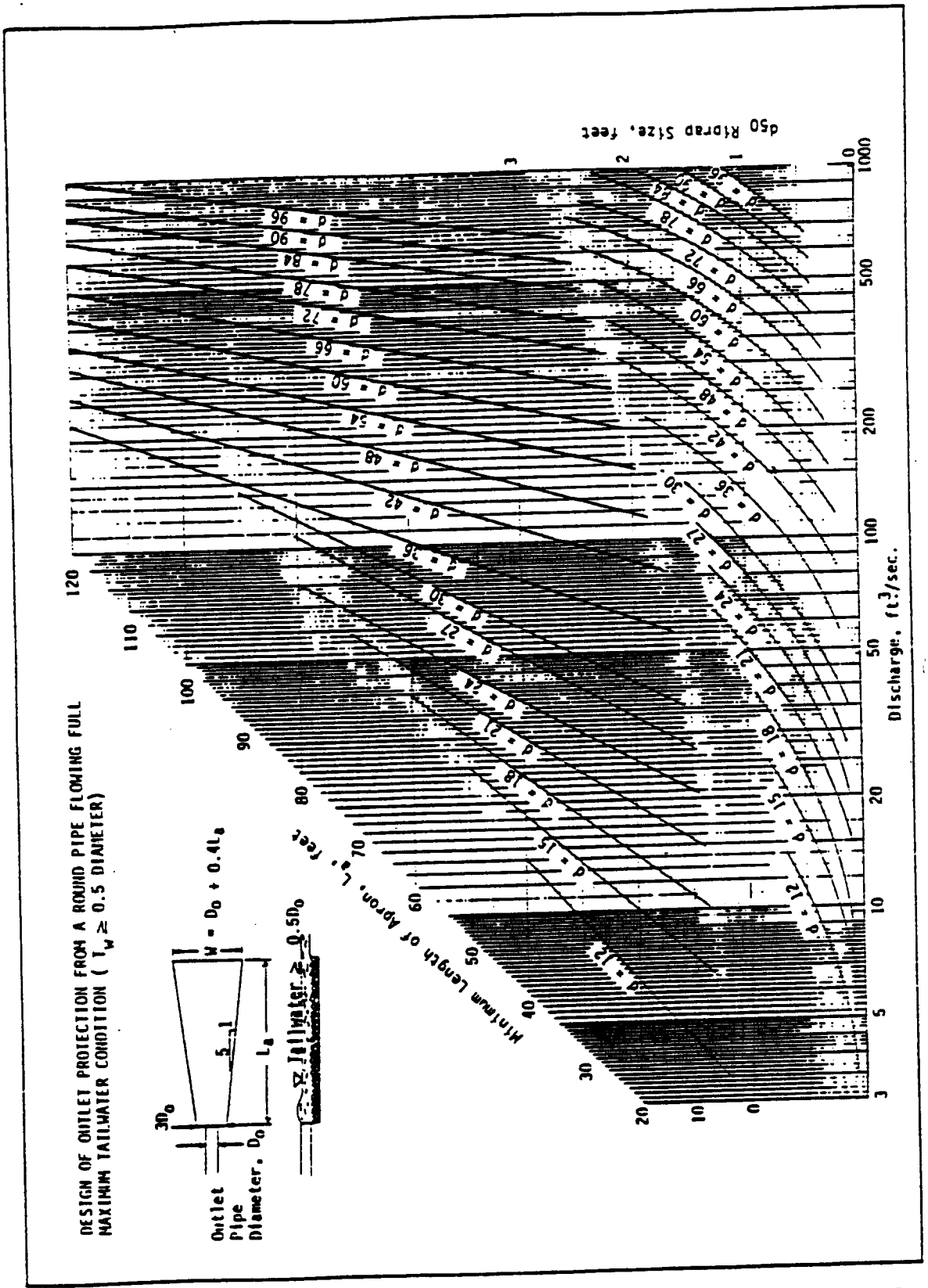
3. The entire channel cross-section should be lined, since the maximum tailwater depth is within one foot of the top of the channel.



Source: USDA-SCS

Plate 1.36c

R0071447



Source: USDA-SCS

Plate 1.36d

R0071448

ES BMP 1.37

RIPRAP

Definition

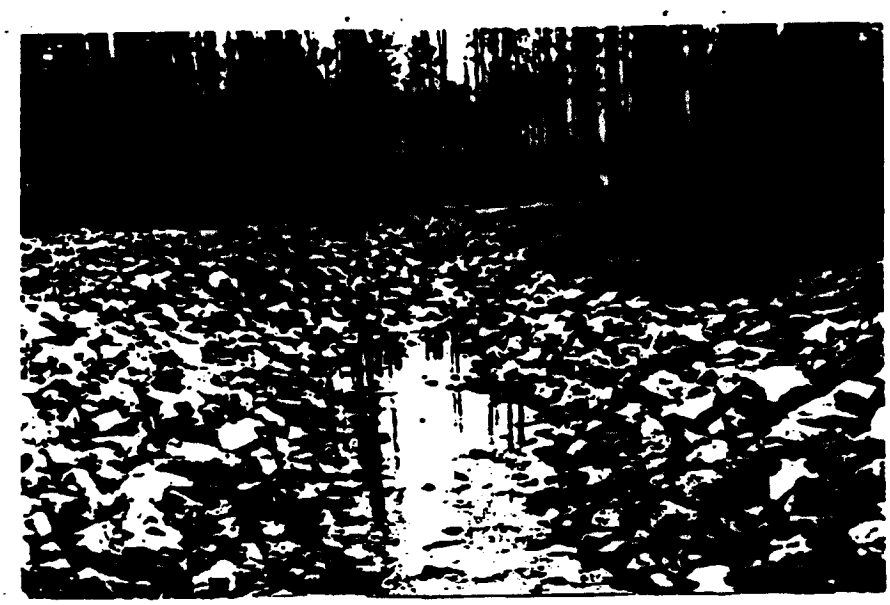
A permanent erosion-resistant ground cover of large, loose, angular stone.

Purposes

1. To protect the soil surface from the erosive forces of concentrated runoff.
2. To slow the velocity of concentrated runoff while enhancing the potential for infiltration.
3. To stabilize slopes with seepage problems and/or non-cohesive soils.

Conditions Where Practice Applies

To soil-water interfaces where the soil conditions, water turbulence and velocity, expected vegetative cover, etc., are such that the soil may erode under the design flow conditions. Riprap may be used, as appropriate, at stormdrain outlets, on channel banks and/or bottoms, roadside ditches, drop structures, at the toe of slopes, etc.



R0071449

Graded vs. Uniform Riprap

Riprap is classified as either graded or uniform. A sample of graded riprap would contain a mixture of stones which vary in size from small to large. A sample of uniform riprap would contain stones which are all fairly close in size.

For most applications, graded riprap is preferred to uniform riprap. Graded riprap forms a flexible self-healing cover, while uniform riprap is more rigid and cannot withstand movement of the stones. Graded riprap is cheaper to install, requiring only that the stones be dumped so that they remain in a well-graded mass. Hand or mechanical placement of individual stones is limited to that necessary to achieve the proper thickness and line. Uniform riprap requires placement in a more or less uniform pattern, requiring more hand or mechanical labor.

Riprap sizes can be designated by either the diameter or the weight of the stones. It is often misleading to think of riprap in terms of diameter, since the stones should be rectangular instead of spherical. However, it is simpler to specify the diameter of an equivalent size of spherical stone. Table 1.37a lists some typical stones by weight, spherical diameter and the corresponding rectangular dimensions. These stone sizes are based upon an assumed specific weight of 165 lbs./ft.^{3}.

Table 1.37a

SIZE OF RIPRAP STONES

Weight (lbs.)	Mean Spherical Diameter (ft.)	Rectangular Shape	
		Length (ft.)	Width, Height (ft.)
50	0.8	1.4	0.5
100	1.1	1.75	0.6
150	1.3	2.0	0.67
300	1.6	2.6	0.9
500	1.9	3.0	1.0
1000	2.2	3.7	1.25
1500	2.6	4.7	1.5
2000	2.75	5.4	1.8
4000	3.6	6.0	2.0
6000	4.0	6.9	2.3
8000	4.5	7.6	2.5
20000	6.1	10.0	3.3

Since graded riprap consists of a variety of stone sizes, a method is needed to specify the size range of the mixture of stone. This is done by specifying a diameter of stone in the mixture for which some percentage, by weight will be smaller. For example, d_{85} refers to a mixture of stones in which 85% of the stone by weight would be smaller than the diameter specified. Most designs are based on d_{50}. In other words, the design is based on the average size of stone in the mixture. Table 1.37b lists Virginia Department of Highways and Transportation (VDH&T) standard graded riprap sizes by diameter and weight of the stone.

R0071450

Table 1.37b

GRADED RIPRAP

Riprap Class	D_{15} Weight (lbs)	D_{15} Spherical Diameter (ft.)	Mean D_{50} Spherical Diameter (ft.)
Class I	50	0.8	1.1
Class II	150	1.3	1.6
Class III	500	1.9	2.2
Type I	1500	2.6	2.8
Type II	6000	4.0	4.5

Sequence of Construction

Since riprap is used where erosion potential is high, construction must be sequenced so that the riprap is put in place with the minimum possible delay. Disturbance of areas where riprap is to be placed should be undertaken only when final preparation and placement of the riprap can follow immediately behind the initial disturbance. Where riprap is used for outlet protection, the riprap should be placed before or in conjunction with the construction of the pipe or channel so that it is in place when the pipe or channel begins to operate.

Design Criteria

Gradation

The riprap shall be composed of a well-graded mixture down to the one-inch size particle such that 50% of the mixture by weight shall be larger than the d_{50} size as determined from the design procedure. A well-graded mixture as used herein is defined as a mixture composed primarily of the larger stone sizes but with a sufficient mixture of other sizes to fill the progressively smaller voids between the stones. The diameter of the largest stone size in such a mixture shall be 1.5 times the d_{50} size.

The designer, after determining the riprap size that will be stable under the flow conditions, shall consider that size to be a minimum size and then, based on riprap gradations actually available in the area, select the size or sizes that equal or exceed the minimum size. The possibility of damage by children shall be considered in selecting a riprap size, especially if there is nearby water to toss the stones into.

Thickness

The minimum thickness of the riprap layer shall be 1.5 times the maximum stone diameter but not less than 6 inches.

R0071451

Quality of Stone

Stone for riprap shall consist of field stone or rough unhewn quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or weathering and it shall be suitable in all other respects for the purpose intended. The specific gravity of the individual stones shall be at least 2.5.

Rubble concrete may be used provided it has a density of at least 150 pounds per cubic foot, and otherwise meets the requirements of this ES BMP Section.

Riprap at Outlets

Design criteria for sizing the stone and determining the dimensions of riprap pads at the outlet of drainage structures are contained in STORMDRAIN OUTLET PROTECTION (ES BMP 1.36).

Riprap for Channel Stabilization

Riprap for channel stabilization shall be designed to be stable for the condition of bank-full flow in the reach of channel being stabilized. The design procedure in Appendix 1.37A, which is extracted from the Federal Highway Administration's Design of Stable Channels with Flexible Linings (69) shall be used.

Riprap size to be used in a channel bend shall extend upstream from the point of curvature and downstream from the point of tangency a distance of at least 5 times the channel bottom width. The riprap shall extend across the bottom and up both sides of the channel.

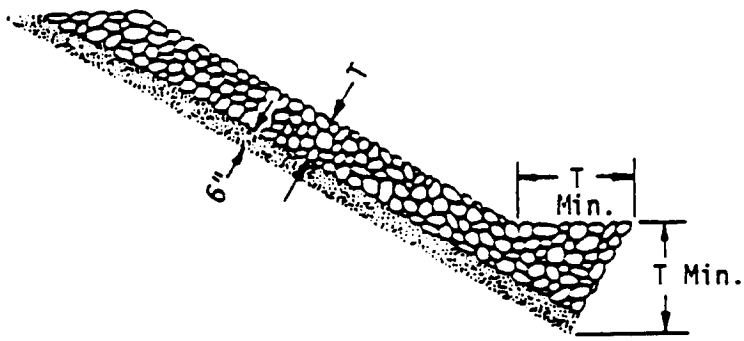
Where riprap is used only for bank protection and does not extend across the bottom of the channel, riprap shall be keyed into the bottom of the channel to a minimum depth equal to the thickness of the blanket and shall extend across the bottom of the channel the same distance. (See Plate 1.37a).

Riprap for Slope Stabilization

Riprap for slope stabilization shall be designed so that the natural angle of repose of the stone mixture is greater than the gradient of the slope being stabilized (see Plate 1.37d).

R0071452

TOE REQUIREMENTS FOR RIPRAP BANK PROTECTION



Source: VDH&T

Plate 1.37a

Filter Blankets

A filter blanket is a layer of material placed between the riprap and the underlying soil surface to prevent soil movement into or through the riprap.

A filter blanket can be of two general forms: a gravel layer or a plastic filter cloth. A determination of the need for a filter blanket is made by comparing particle sizes of the overlying material and the base material in accordance with the criteria below:

Gravel filter blanket: The following relationships must exist:

$$\frac{d_{15}\ \text{filter}}{d_{85}\ \text{base}} < 5 < \frac{d_{15}\ \text{filter}}{d_{15}\ \text{base}} < 40$$

and,

$$\frac{d_{50}\ \text{filter}}{d_{50}\ \text{base}} < 40$$

In these relationships, filter refers to the overlying material and base refers to the underlying material. The relationships must hold between the filter material and the base material and between the riprap and the filter material. In same cases, more than one layer of filter material may be needed. Each layer of filter material should be approximately 6 inches thick.

Plastic filter cloth: Plastic filter cloth may be used in place of or in conjunction with gravel filters. The following particle size relationships must exist:

R0071453

1. For filter cloth adjacent to granular materials containing 50 percent or less (by weight), of fine particles (less than 0.074 mm):

   a. $\frac{d_{85} \text{ base (mm)}}{\text{EOS* filter cloth (mm)}} > 1$

   b. Total open area of filter is less than 36 percent.

2. For filter cloth adjacent to all other soils:

   a. EOS* less than U.S. Standard Sieve No. 70.
   b. Total open area of filter is less than 10 percent.

No filter cloth should be used with less than 4 percent open area or an EOS* less than U.S. Standard Sieve No. 100.

*EOS - Equivalent Opening Size to a U.S. Standard Sieve Size.

Filter blankets should always be provided where seepage from underground sources threatens the stability of the riprap. No filter blanket is required for riprap used for storm drain outlet protection.

Construction Specifications

Subgrade Preparation: The subgrade for the riprap or filter shall be prepared to the required lines and grades. Any fill required in the subgrade shall be compacted to a density approximating that of the surrounding undisturbed material. Brush, trees, stumps and other objectionable material shall be removed.

Filter Blanket: Placement of the filter blanket should be done immediately after slope preparation. For granular filters the stone should be spread in a uniform layer to the specified depth. Where more than one layer of filter material is used, the layers should be spread so that there is minimal mixing of the layers.

For plastic filter clothes, the cloth should be placed directly on the prepared slope. The edges of the sheets should overlap by at least 12 inches. Anchor pins, 15 inches long, should be spaced every 3 feet along the overlap. The upper and lower ends of the cloth should be buried a minimum of 12 inches deep. Care should be taken not to damage the cloth when placing the riprap. If damage occurs, that sheet should be removed and replaced. For large stone (12 inches or greater), a 4-inch layer of gravel may be necessary to prevent damage to the cloth.

Stone Placement: Placement of riprap should follow immediately after placement of the filter. The riprap should be placed so that it produces a dense well-graded mass of stone with a minimum of voids. The desired

R0071454

distribution of stones throughout the mass may be obtained by selective loading at the quarry, controlled dumping of successive loads during final placing, or by a combination of these methods. The riprap should be placed to its full thickness in one operation. The riprap should not be placed in layers. The riprap should not be placed by dumping into chutes or similar methods which are likely to cause segregation of the various stone sizes. Care should be taken not to dislodge the underlying material when placing the stones.

The finished slope should be free of pockets of small stone or clusters of large stones. Hand placing may be necessary to achieve the required grades and a good distribution of stone sizes. Final thickness of the riprap blanket should be within plus or minus 1/4 of the specified thickness.

Maintenance

Once a riprap installation has been completed, it should require very little maintenance. It should, however, be inspected periodically to determine if high flows have caused scour beneath the riprap or dislodged any of the stone. If repairs are needed, they should be accomplished immediately.

APPENDIX 1.37A

RIPRAP DESIGN IN CHANNEL

The design method described below is adapted from Hydraulic Engineering Circular No. 15 of the Federal Highway Administration. It is applicable to both straight and curved sections of channel where the flow is tangent to the bank of the channel.

Tangent Flow - Federal Highway Administration Method

This design method determines a stable rock size for straight and curved sections of channels. It is assumed that the shape, depth of flow, and slope of the channel are known. A stone size is chosen for the maximum depth of flow. If the sides of the channel are steeper than 3:1, the stone size must be modified accordingly. The final design size will be stable on both the sides of the channel and the bottom.

1. Enter Plate 1.37b with the maximum depth of flow (feet) and channel slope (feet/foot). Where the two lines intersect, choose the d_{50} size of stone. (Select the d_{50} for the diagonal line above the point of intersection.)

2. If channel side slopes are steeper than 3:1, continue with step 3; if not, the procedure is complete.

3. Enter Plate 1.37c with the side slope and the base width to maximum depth ratio (B/d). Where the two lines intersect, move horizontally left to read K_1.

4. Determine from Plate 1.37d the angle of repose for the d_{50} size of stone and the side slope of the channel. (Use 42° for d_{50} greater than 1.0'±. Do not use riprap on slopes steeper than the angle of repose for the size of stone.)

5. Enter Plate 1.37e with the side slope of the channel and the angle of repose for the d_{50} size of stone. Where the two lines intersect, move vertically down to read K_2.

6. Compute $d_{50} \times K_1/K_2 = d'_{50}$ to determine the correct size stone for the bottom and side slopes of straight sections of channel.

For Curved Sections of Channel

1. Compute the radius of the curve (Ro), measured at the outside edge of the bottom.

2. Compute the ratio of the top width of the water surface (Bs) to the radius of the curve (Ro), Bs/Ro.

3. Enter Plate 1.37f with the ratio Bs/Ro. Move vertically until the curve is intersected. Move horizontally left to read K_3.

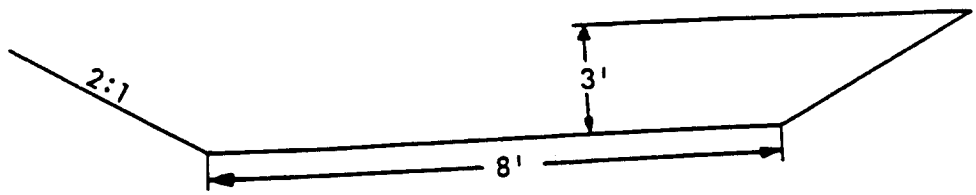
R0071456

4. Compute $d'_{50} \times K_3 = d_{50c}$ to determine the correct size stone for bottom and side slopes of curved sections of channel.

Example Problem

Given:

A trapezoidal channel 3 feet deep, 8 feet bottom, 2:1 side slopes, and a 2% slope.



Calculate:

A stable riprap size for the bottom and side slopes of the channel.

Solution:

1. From Plate 1.37b, for a 3-foot-deep channel on a 2% grade, d_{50} = 0.75 feet or 9 inches.
2. Since the side slopes are steeper than 3:1, continue with step 3.
3. From Plate 1.37c, B/d = 8/3 = 2.67, Z = 2, K_1 = 0.82.
4. From Plate 1.37d, for d_{50} = 9 inches, θ = 41°.
5. From Plate 1.37e, for Z = 2 and θ = 41°, K_2 = 0.73.
6. $d_{50} \times K_1/K_2 = d'_{50} = 0.75 \times 0.82/0.73 = 0.84$ feet.

   $0.84 \text{ feet} \times \frac{12 \text{ inches}}{1 \text{ foot}} = 10.08$. Use d'_{50} = 10 inches.

Given:

The preceding channel has a curved section with a radius of 50 feet.

Calculate:

A stable riprap size for the bottom and side slopes of the curved section of channel.

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Solution:

1. R_o = 30 inches.

2. B_s/R_o = 20/30 = 0.67

3. From Plate 1.37f, for B_s/R_o = 0.67, K_3 = 1.4

4. $d'_{50} \times K_3 = d_{50c}$ = 0.84 x 1.4 = 1.2 feet

   $$1.2 \text{ feet} \times \frac{12 \text{ inches}}{1 \text{ foot}} = 14.4 \text{ inches}$$

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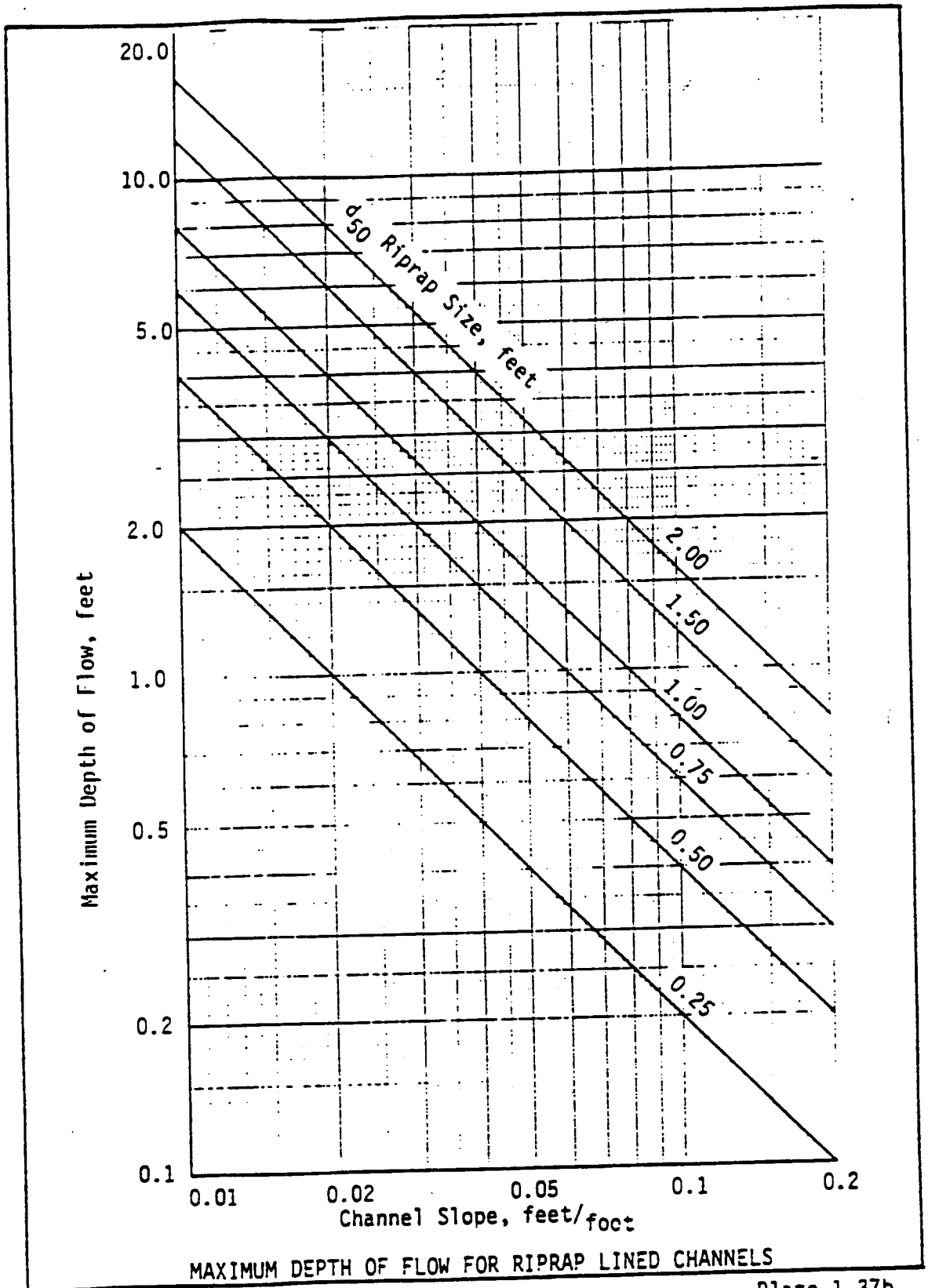
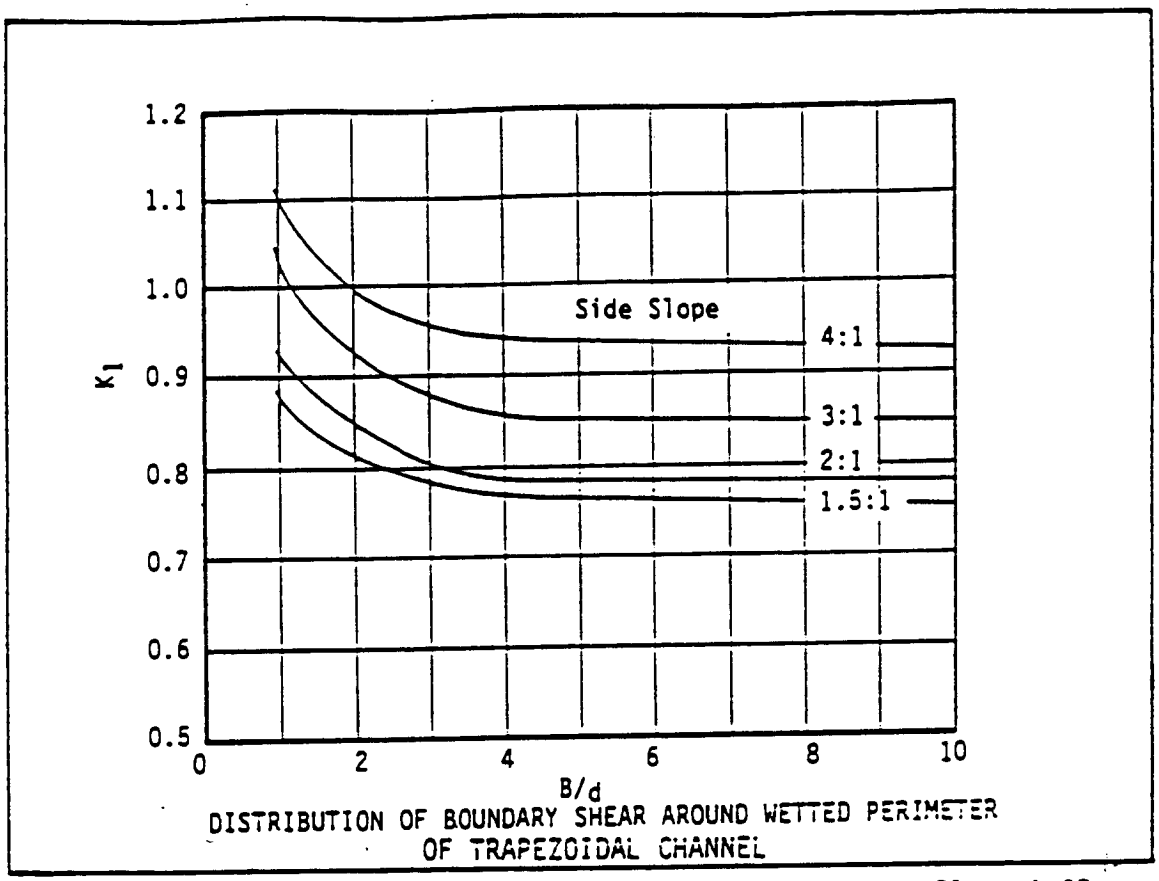


MAXIMUM DEPTH OF FLOW FOR RIPRAP LINED CHANNELS

Plate 1.37b

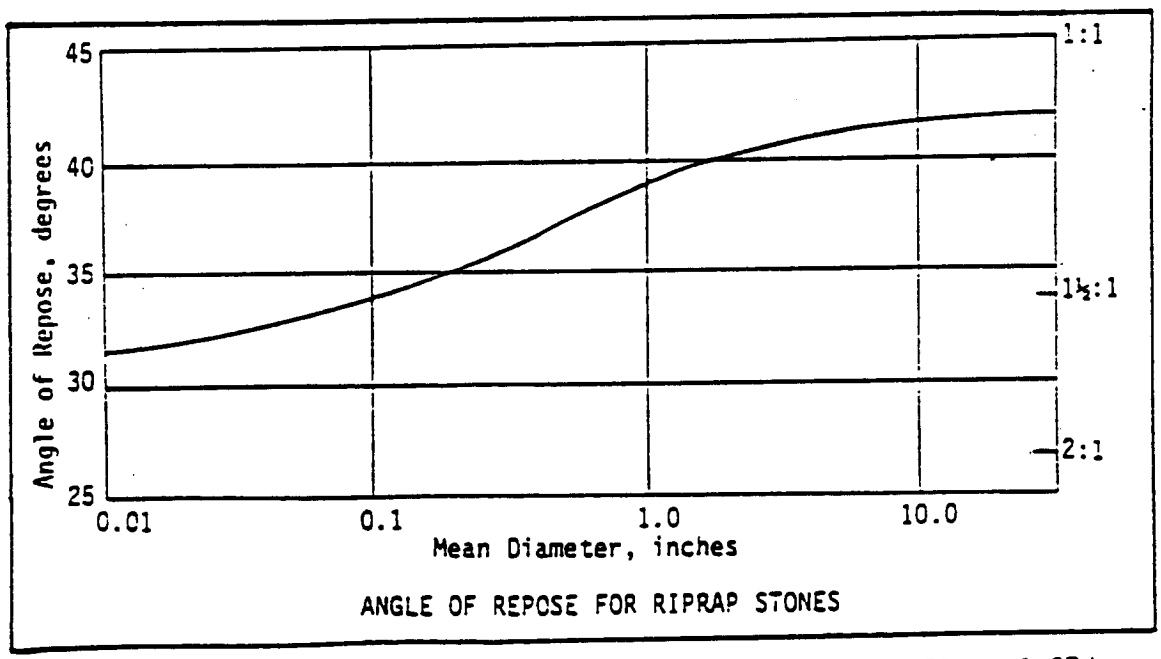
Source: VDH&T Drainage Manual

R0071459



DISTRIBUTION OF BOUNDARY SHEAR AROUND WETTED PERIMETER OF TRAPEZOIDAL CHANNEL

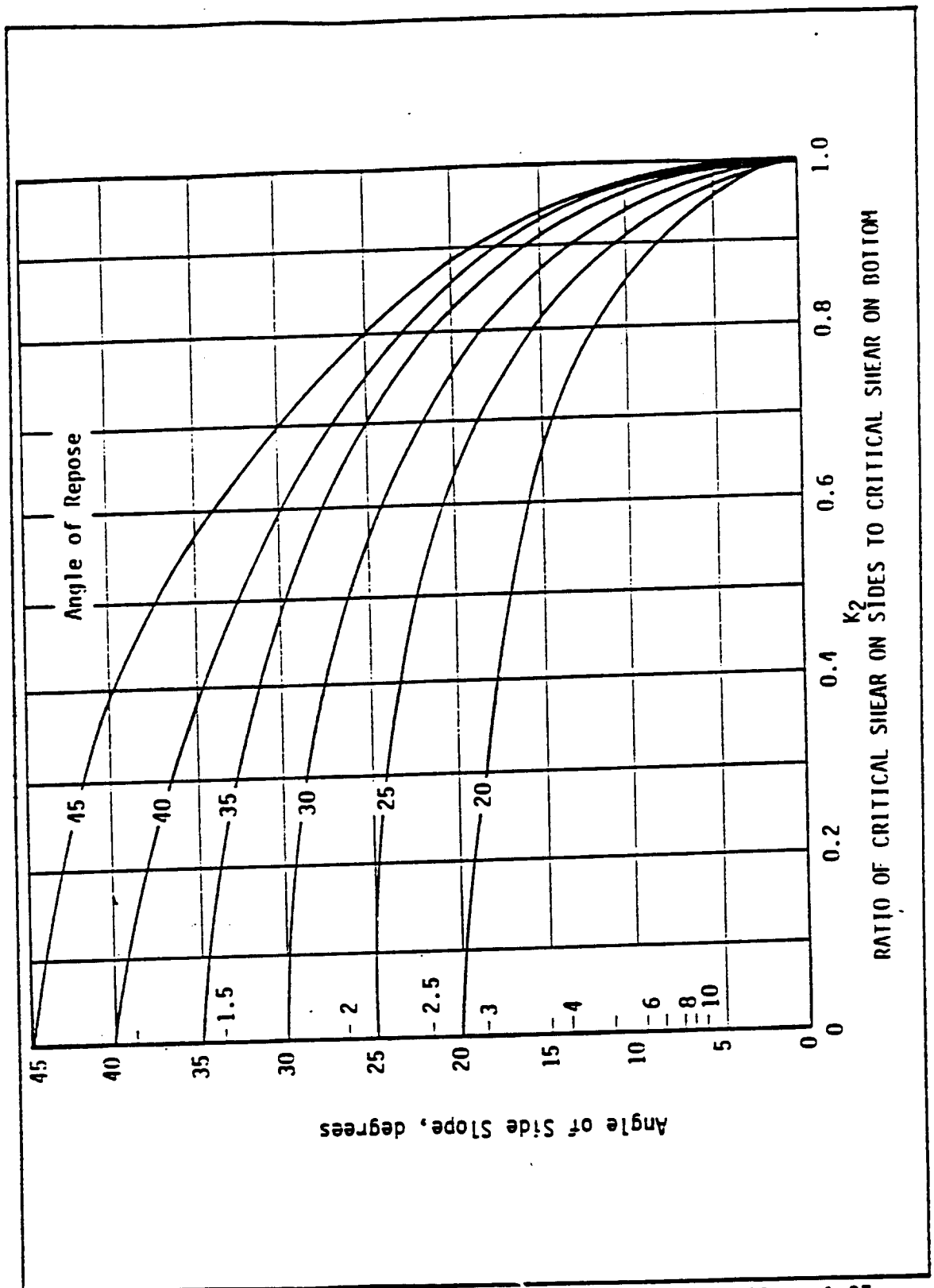
Plate 1.37c



ANGLE OF REPOSE FOR RIPRAP STONES

Source: VDH&T Drainage Manual

Plate 1.37d



Source: VDH&T Drainage Manual

Plate 1.37e

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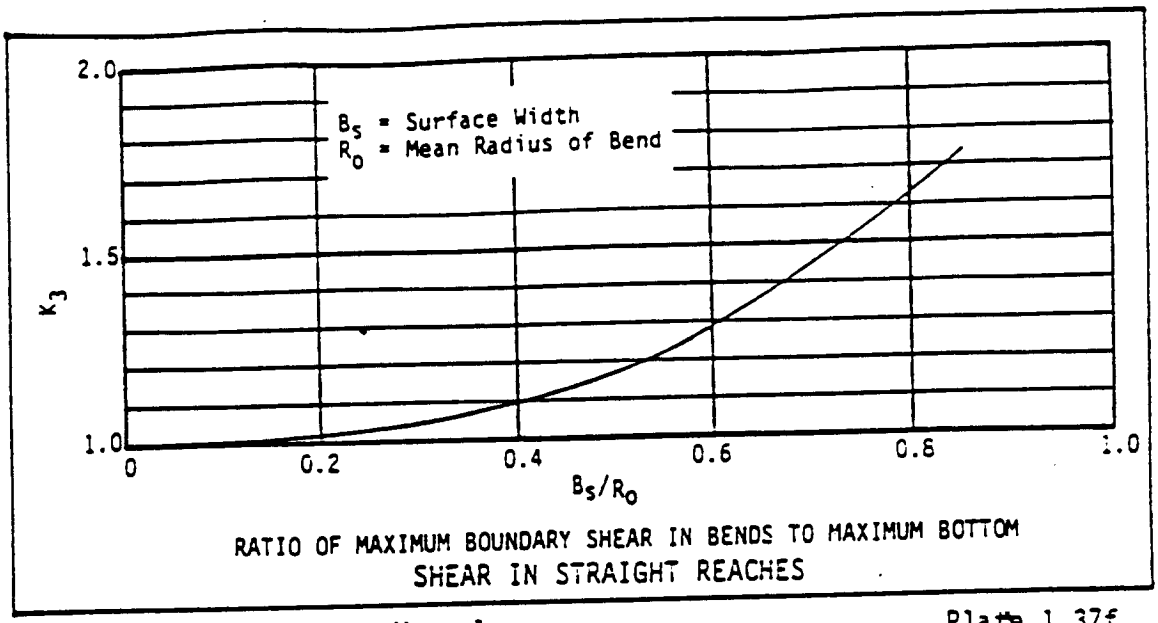

RATIO OF MAXIMUM BOUNDARY SHEAR IN BENDS TO MAXIMUM BOTTOM SHEAR IN STRAIGHT REACHES

Source: VDH&T Drainage Manual

Plate 1.37f

R0071462

ES BMP 1.38

CHECK DAMS

Definition

Small temporary dams constructed across a swale or drainage ditch.

Purpose

To reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch. This practice also traps small amounts of sediment generated in the ditch itself. However, this is not a sediment trapping practice and should not be used as such.

Conditions Where Practice Applies

This practice is limited to use in small open channels which drain 10 acres or less. It should not be used in a live stream. They are especially applicable to sloping sides where the gradient of waterways is close to the maximum for a grass lining. Some specific applications include:

1. Temporary ditches or swales which, because of their short length of service, cannot receive a non-erodible lining but still need some protection to reduce erosion.



1. Permanent ditches or swales which for some reason cannot receive a permanent non-erodible lining for an extended period of time.

2. Either temporary or permanent ditches or swales which need protection during the establishment of grass linings.

Planning Considerations

Check dams can be constructed of either stone or logs. Log check dams are more economical from the standpoint of material costs, since logs can usually be salvaged from clearing operations. However, log check dams require more time and hand labor to install. Stone for check dams, on the other hand, must generally be purchased. However, this cost is offset somewhat by the ease of installation.

If stone check dams are used in grass-lined channels which will be mowed, care should be taken to remove all the stone from the dam when the dam is removed. This should immediately include any stone which has washed downstream.

Since log check dams are embedded in the soil, their removal will result in more disturbance of the soil than will removal of stone check dams. Consequently, extra care should be taken to stabilize the area when log dams are used in permanent ditches or swales.

Specifications

No formal design is required for a check dam; however, the following criteria should be adhered to when specifying check dams.

The drainage area of the ditch or swale being protected should not exceed 10 acres. The maximum height of the check dam should be 2 feet. The center of the check dam must be at least 6 inches lower than the outer edges (see Plate 1.38a). The cross-sections of the dams should be as shown in Plates 1.38a and 1.38b, respectively, for logs and stone. The maximum spacing between the dams should be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam. (See Plate 1.38c).

Stone check dams should be constructed of FDOT Aggregate No. 1 (2- to 3-inch stone). The stone should be placed according to the configuration in Plate 1.38b. Hand or mechanical placement will be necessary to achieve complete coverage of the ditch or swale and to insure that the center of the dam is lower than the edges.

Log check dams should be constructed of 4- to 6-inch logs salvaged from clearing operation site, if possible. The logs should be embedded into the soil at least 18 inches. The 6-inch lower height required at the center can be achieved either by careful placement of the logs or by cutting the logs after they are in place.

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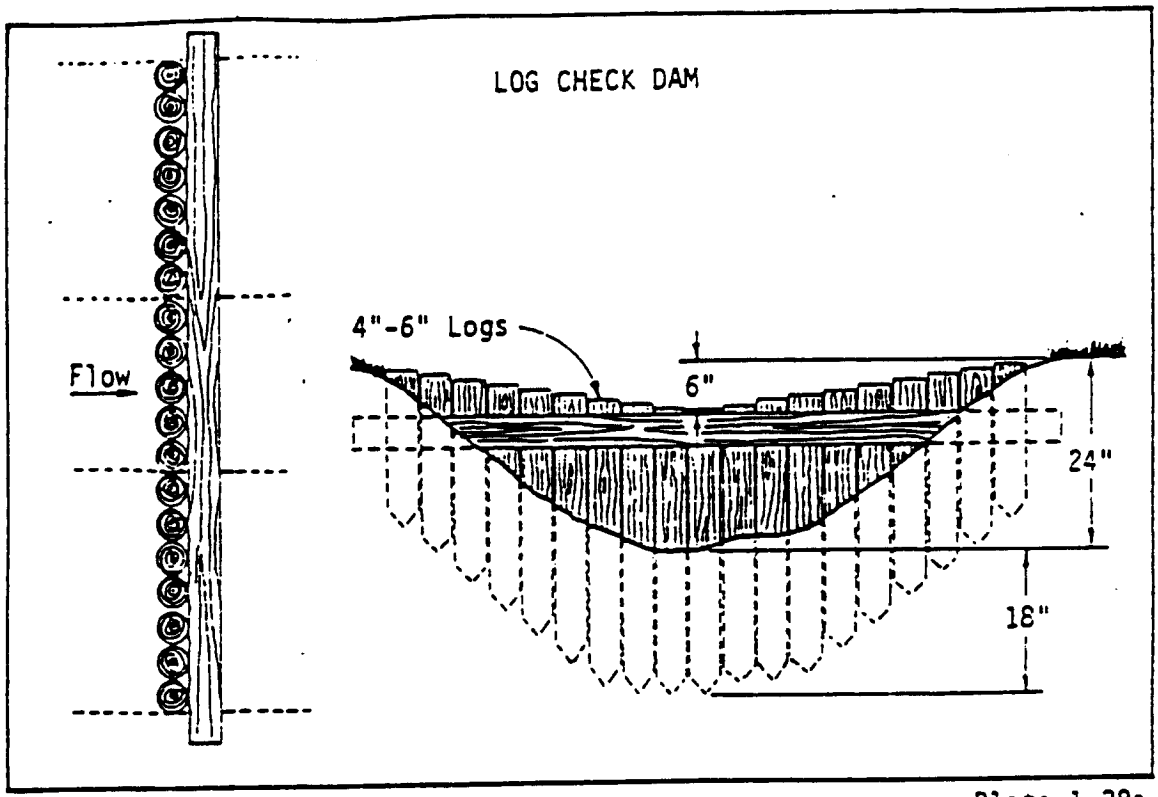
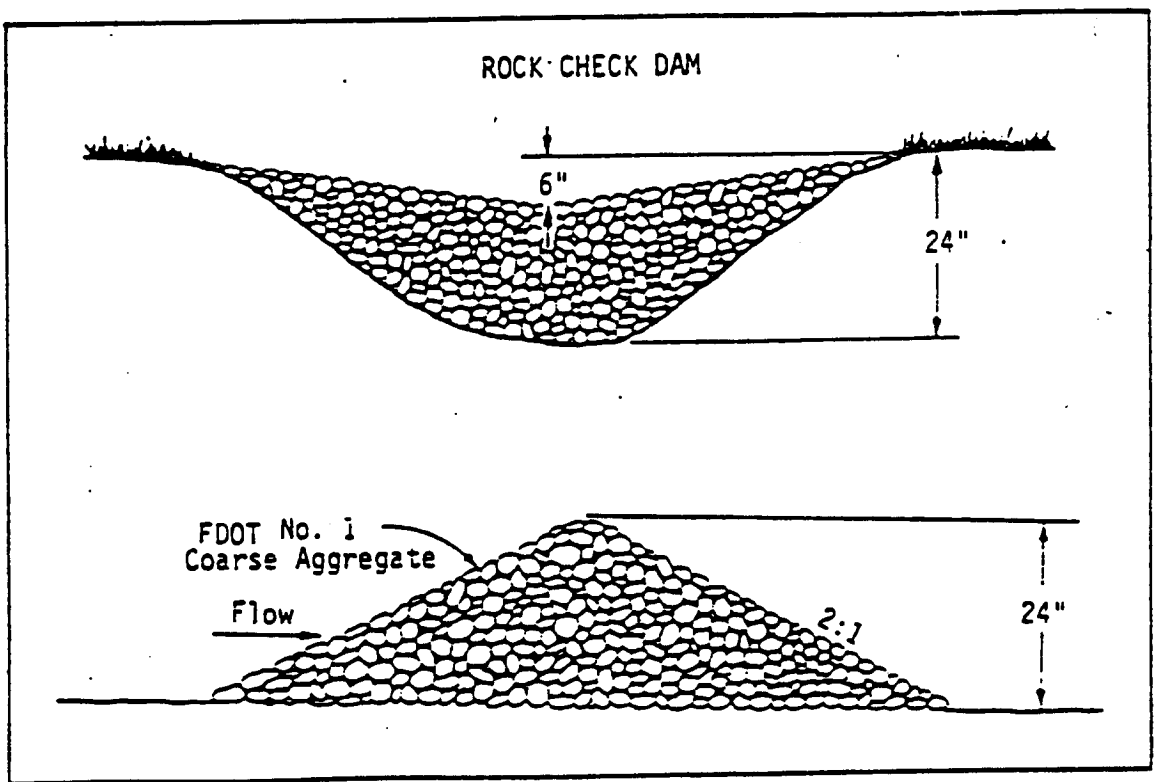


Source: Va SWCC

Plate 1.38a



Source: Va SWCC

Plate 1.38b

R0071465

Logs and/or brush should be placed on the downstream side of the dam to prevent scour during high flows.

Sediment Removal

While this practice is not intended to be used primarily for sediment trapping, some sediment will accumulate behind the check dams. Sediment should be removed from behind the check dams when it has accumulated to one half of the original height of the dam.

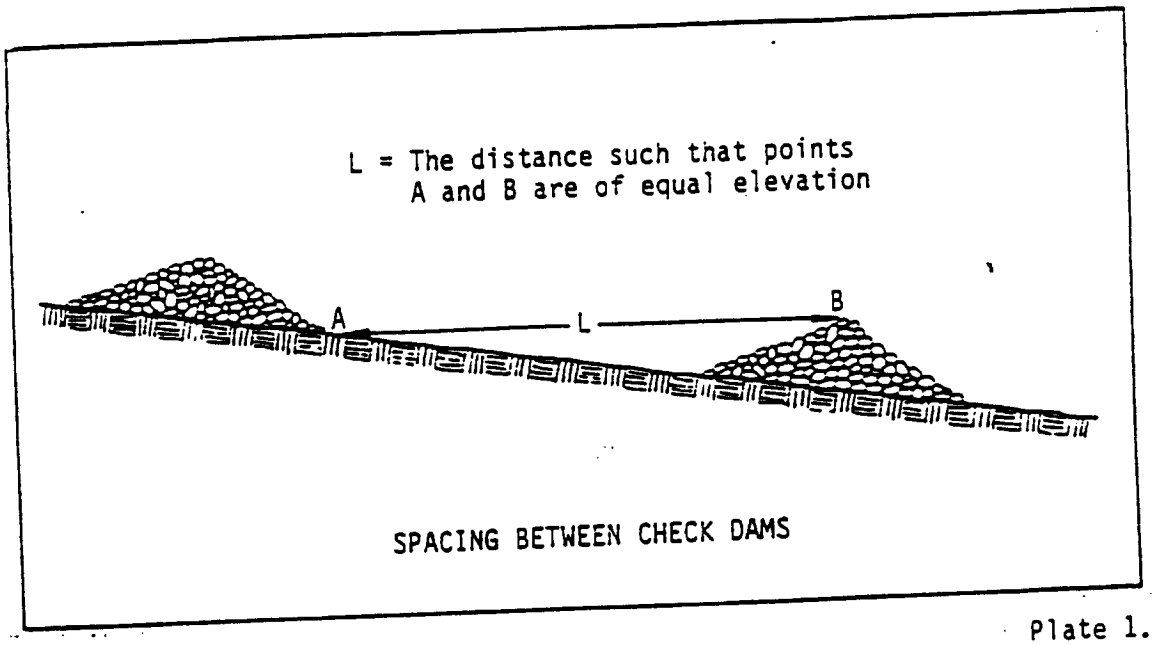


Plate 1.38c

Source: Va SWCC

Removal

Check dams must be removed when their useful life has been completed. In temporary ditches and swales, check dams should be removed and the ditch filled in when it is no longer needed. In permanent structures, check dams should be removed when a permanent lining can be installed. In the case of grass-lined ditches, check dams should be removed when the grass has matured sufficiently to protect the ditch or swale. The area beneath the check dams should be seeded and mulched or sodded (depending upon velocity) immediately after they are removed.

Maintenance

Check dams should be checked for sediment accumulation after each significant rainfall. Sediment should be removed when it reaches one-half of the original height or before.

Regular inspections should be made to insure that the center of the dam is lower than the edges. Erosion caused by high flows around the edges of the dam should be corrected immediately.

R0071466

ES BMP 1.39

WATERWAY DROP STRUCTURE

Definition

A permanent structure or series of structures designed to set up the flow of water down a slope without causing erosion of the channel.

Purpose

To prevent channel erosion of waterways by preventing high velocity flows in moderately steep channels.

Conditions Where Practice Applies

1. In man-made channels which must traverse long, relatively steep slopes without large increases in the flow velocity.

2. In natural channels which have long or relatively steep sections and which, as a result of construction activities, are expected to experience channel erosion problems.



Planning Considerations

Waterway drop structures are expensive permanent structures and consequently should be designed by a qualified engineer.

When locating the structure, attention should be given to changed water elevations which will result and their effect upon adjacent areas.

Waterway drop structures of this type are most cost-effective where the design flow is 100 cfs or greater and the drop in elevation across the structure is less than 10 feet.

Chapter 6 of the SCS Engineering Field Manual contains criteria for selecting the type of structure.

Design Criteria

Waterway drop structures should either be designed on an individual basis by a qualified engineer or constructed from standard plans which may be obtained, for structures with a drop of up to 9 feet, from USDA-Soil Conservation Service. In general, however, the structure should adhere to the following criteria:

Location

Waterway drop structures should be located on reasonably straight sections of channel, with no upstream or downstream curves within 100 feet of the structure. It is often necessary to straighten the channel alignment so that it merges smoothly with the existing channel. This will lessen the likelihood of scour in channel.

The site of the structure should be one that provides a stable foundation. The foundation material should have sufficient strength to support the structure and to resist sliding and piping. The foundation material should also be relatively homogeneous to prevent uneven settling.

Capacity

The structure should be designed to pass the peak rate of runoff from a 10-year storm. If the consequences from the failure of the structure will be severe, the design rate of flow should be increased accordingly. The maximum design flow should not exceed 1000 cfs (see Plate 1.39a).

Dimensions

Refer to Plate 1.39b. The width W, and the depth of flow d, over the weir, should be those necessary to achieve the design flow. A minimum freeboard of 6 inches should be allowed between the design high water and the top of the structure. The maximum drop H should not exceed 10 feet.

The downstream apron of the structure should extend at zero grade far enough downstream to prevent scour of the channel. The length of the apron can be calculated by the following equation:

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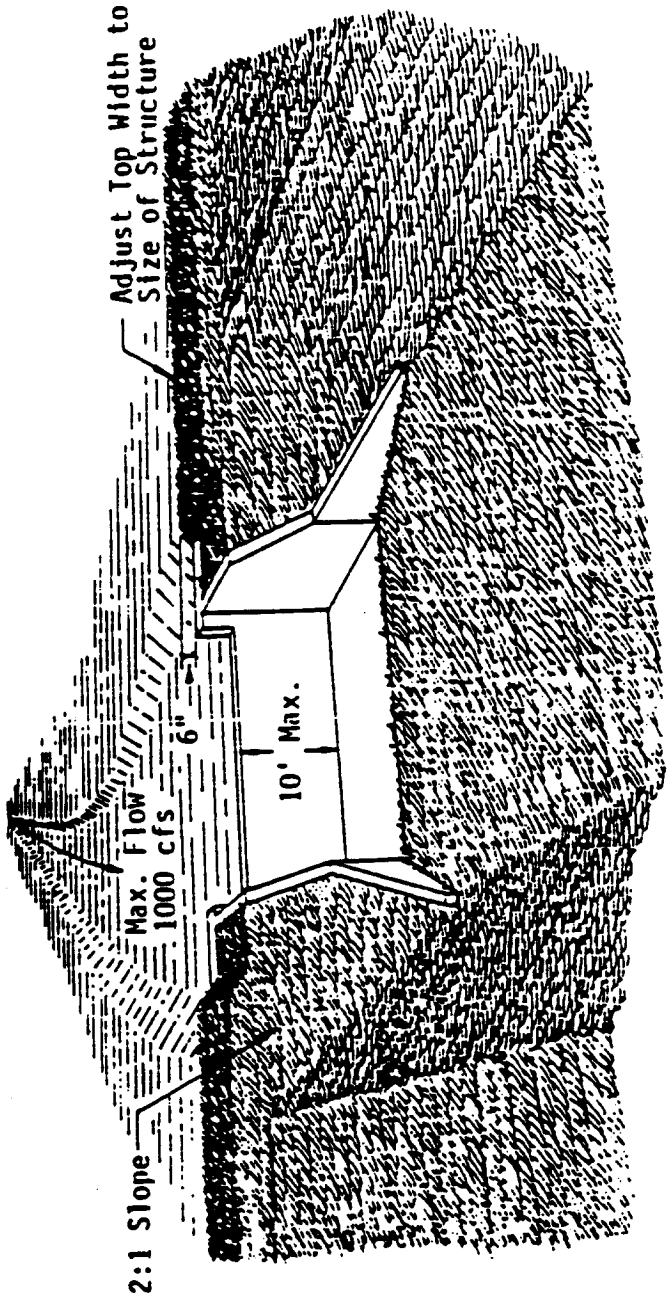
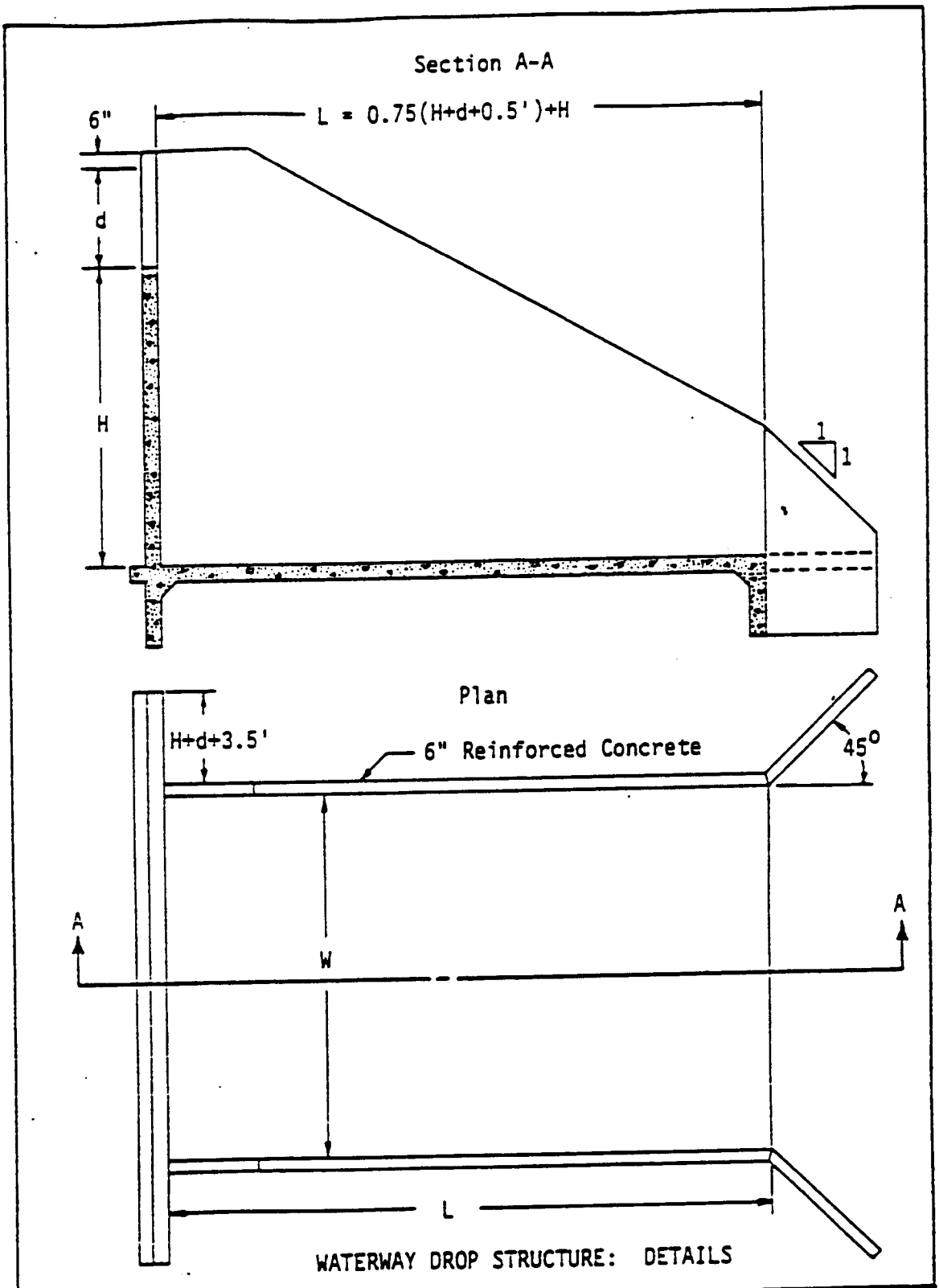


WATERWAY DROP STRUCTURE

Source: USDA-SCS

Plate 1.39a

R0071469



WATERWAY DROP STRUCTURE: DETAILS

Source: Soil and Water Conservation Engineering, Schwab et. al.

Plate 1.39b

R0071470

$$L = 0.75 (H + d) + H$$

where,

L = the length of the apron
H = the drop in elevation across the structure
d = the depth of flow across the weir plus 7 inches

The headwall extensions should extend a distance of (H + d + 3') on either side of the weir. The wing walls should project out from the channel at a 45° angle at a distance of 2.25d. (See Plate 1.39b).

Embankment

Depending upon the topography, an earthen embankment may need to be constructed in conjunction with the waterway drop structure to direct the flow of water to the spillway of the structure. The embankment should be a minimum of 6 inches higher than the top of the structure. The top width of the embankment should correspond to the width of the structure. (See Plate 1.39a). Side slopes of the embankment should not be steeper than 2:1.

Materials

The waterway drop structure shall be constructed of 6-inch thick reinforced concrete. Reinforcing of the structure shall be in accordance with accepted engineering practice. Standard plans for reinforcing can be obtained from the USDA-Soil Conservation Service.

Construction Specifications

1. All runoff should be diverted away from the swale, if possible, during construction.

2. The foundation of the structure shall be well compacted and free of roots, rocks, organic matter and other objectionable material.

3. Pouring of concrete for the structure shall be done in a continuous operation.

4. Backfill around the structure shall be hand-compacted in 4-inch layers.

5. The embankment shall be constructed according to the specifications for sediment basin embankments (Std. & Spec. 1.26).

6. The embankment and all other disturbed areas shall be seeded within 15 days of construction.

7. All necessary precautions shall be taken to prevent excess erosion and sedimentation during construction of the structure.

R0071471

Maintenance

Once the waterway drop structure has been established and the area around it stabilized, maintenance should be minimal. Immediately after construction, however, the channel should be checked for scour above and below the structure. The embankment should be checked to insure that vegetation is well established. The structure itself should be checked for cracking of the concrete, uneven settlement, and piping around the structure.

R0071472

ES BMP 1.40

LEVEL SPREADER

Definition

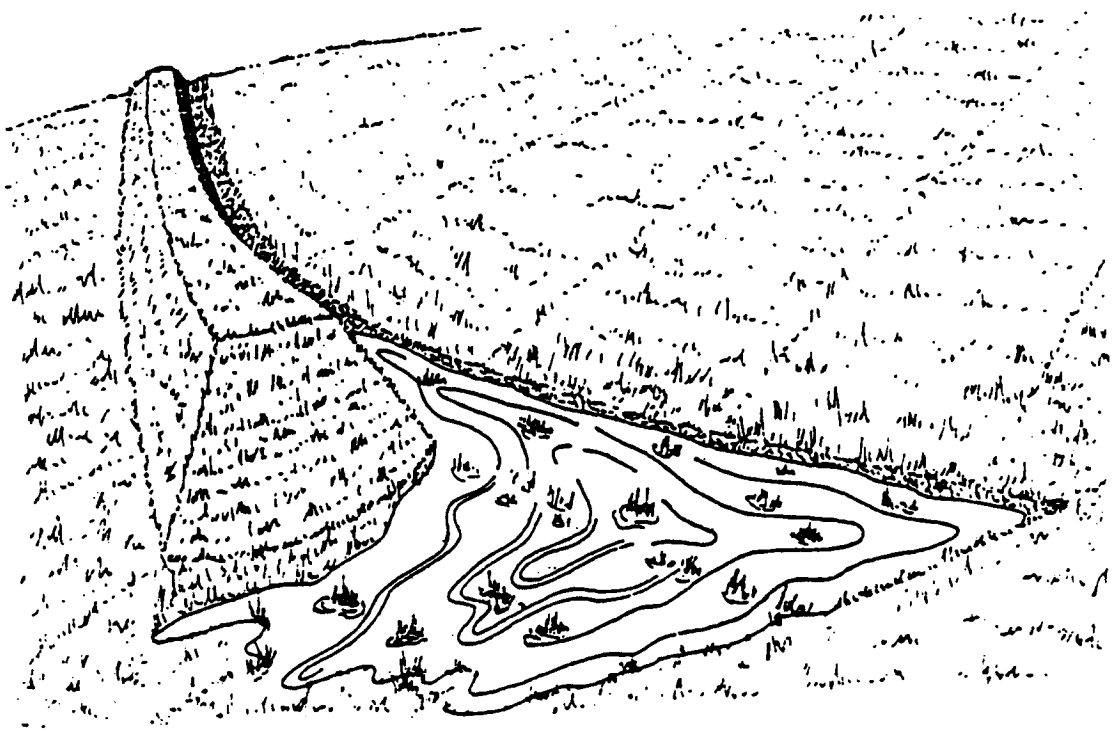
An outlet for dikes and diversions consisting of an excavated depression constructed at zero grade across a slope whereby concentrated runoff may be discharged at non-erosive velocities onto undisturbed area stabilized by existing vegetation.

Purpose

To convert concentrated runoff to sheet flow and release it onto area stabilized by existing vegetation.

Conditions Where Practice Applies

Where sediment-free storm runoff is intercepted and diverted away from graded areas onto undisturbed stabilized areas. This practice applies only in those situations where the spreader can be constructed on undisturbed soil and the area below the level lip is stabilized by natural vegetation. The water should not be allowed to reconcentrate after release.



R0071473

Planning Considerations

The TEMPORARY DIVERSION DIKE (ES BMP 1.15) and the TEMPORARY RIGHT-OF- WAY DIVERSION (ES BMP 1.17) each call for a stable outlet for concentrated stormwater flows. The Level Spreader can be used for this purpose provided the runoff is relatively free of sediment. If properly constructed, the Level Spreader will significantly reduce the velocity of concentrated stormwater and spread it uniformly over a stable undisturbed area.

This practice is relatively easy and inexpensive to install. However, particular care must be taken during construction to insure that the lower lip of the structure is level. If there are any depressions in the lip, flow will tend to concentrate at these points and erosion will occur, resulting in failure of the outlet. Regular maintenance is essential for this practice.

Design Criteria

No formal design is required. The following criteria must be met:

Length

Spreader Length will be determined by estimating the flow expected from a 10-year storm (Q_{10}), and selecting the appropriate length from the following table:

Design Flow, Q_{10} (CFS)	Minimum Length (FEET)
0 - 10	10
10 - 20	20
20 - 30	30
30 - 40	40
40 - 50	50

Width

The minimum acceptable width shall be 6 feet. (See Plate 1.40a).

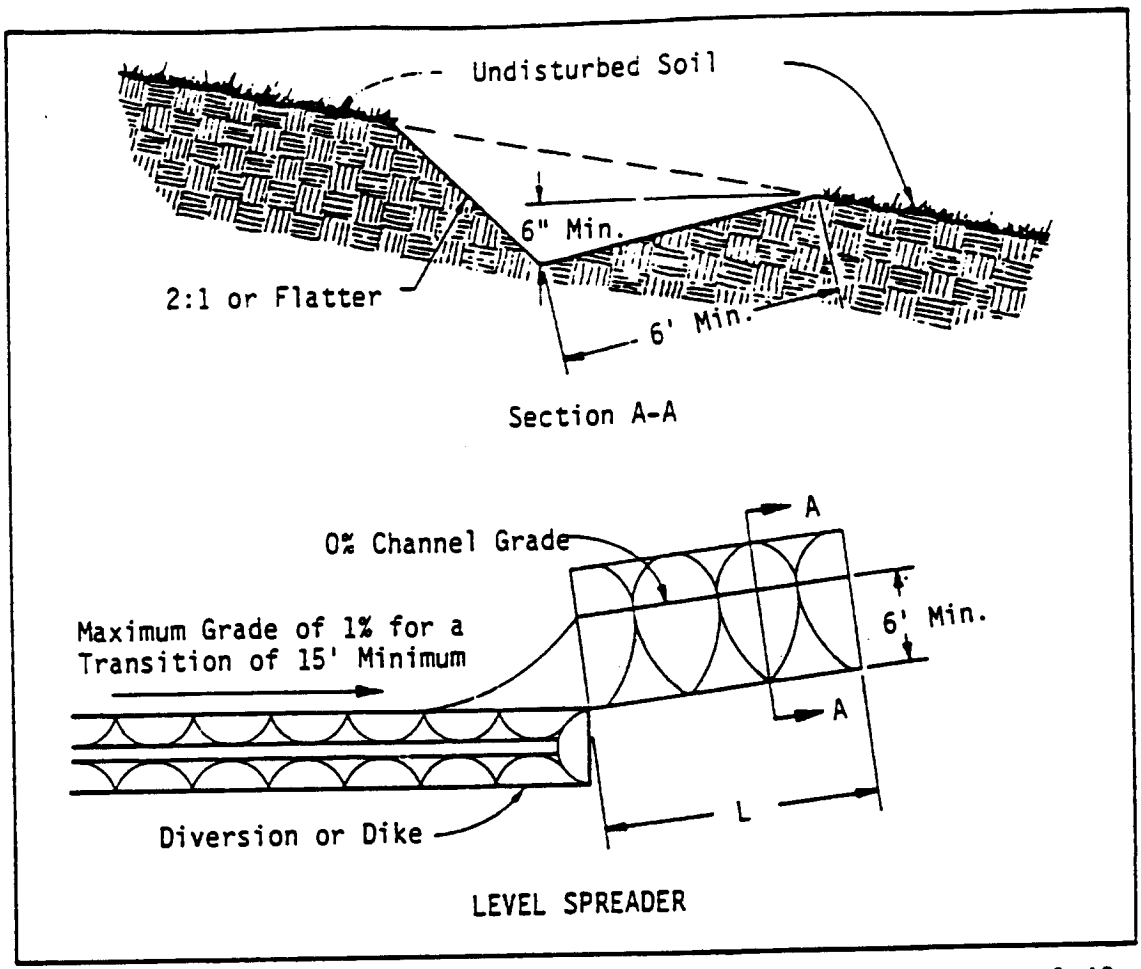
Depth

The depth of the level spreader as measured from the lip shall be at least 6 inches. The depth shall be uniform across the entire length of the measure.
(See Plate 1.40a).

Grade

1. The grade of the channel for the last 20 feet of the dike or diversion entering the level spreader shall be less than or equal to 1%. (See Plate 1.40a).

2. The grade of the level spreader shall be 0%.



Source: Va SWCC

Plate 1.40a

Outlet

The release of the stormwater will be over the level lip onto an undisturbed stabilized area. The level lip should be of uniform height and zero grade over the length of the spreader.

Construction Specifications

1. Level spreaders must be constructed on undisturbed soil (not fill material).

2. The entrance to the spreader must be shaped in such a manner as to insure that runoff enters directly onto the 0% channel.

3. The level lip shall be constructed on zero percent grade to insure uniform spreading of storm runoff.

4. The released runoff must outlet onto undisturbed stabilized areas in sheet flow and not be allowed to reconcentrate below the structure.

Maintenance

The measure shall be inspected after every rainfall and repairs made if required. The contractor should avoid the placement of any material on and prevent construction traffic across the structure. If the measure is damaged by construction traffic, it shall be repaired immediately.

R0071476

ES BMP 1.50

SUBSURFACE DRAIN

Definition

A perforated conduit such as pipe, tubing or tile installed beneath the ground to intercept and convey ground water.

Purposes

1. To prevent sloping soils from becoming excessively wet and subject to sloughing.

2. To improve the quality of the growth medium in excessively wet areas by lowering the water table.

3. To drain stormwater detention areas or structures.

Conditions Where Practice Applies

Wherever excess water must be removed from the soil. The soil must be deep and permeable enough to allow an effective system to be installed. Either a gravity outlet must be available or pumping must be provided. These standards do not apply to foundation drains.



R0071477

Planning Considerations

Subsurface drainage systems are of two types: relief drains and interceptor drains. Relief drains are used either to lower the water table in order to improve the growth of vegetation, or to remove surface water. They are installed along a slope and drain in the direction of the slope. They can be installed in a gridiron pattern, a herringbone pattern, or a random pattern (see Plate 1.50a).

Interceptor drains are used to remove water as it seeps down a slope, to prevent the soil from becoming saturated and subject to slippage. They are installed across a slope and drain to the side of the slope. They usually consist of a single pipe or series of single pipes instead of a patterned layout (see Plate 1.50b).

Design Criteria

Location

Tree roots can often clog subsurface drain systems. Consequently, subsurface drains should be located such that there are no trees within 50 feet of the drain.

Relief drains - Relief drains should be located through the center of wet areas. They should drain in the same direction as the slope.

Interceptor drains - Interceptor drains should be located on the uphill side of wet areas. They should be installed across the slope and drain to the side of the slope.

Capacity of Drains

The required capacity of a subsurface drain depends upon its use.

Relief drains - Relief drains installed in a uniform pattern should remove a minimum of 1 inch of groundwater in 24 hours (0.042 cfs/acre). The design capacity must be increased accordingly to accommodate any surface water which enters directly into the system (Plate 1.50d).

Interceptor drains or relief drains in a random pattern - Interceptor drains or relief drains installed in a random pattern should remove a minimum of 1.5 cfs/1000 feet of length. This value should be increased for sloping land according to the values in Table 1.50a. In addition, if a flowing spring or surface water enters directly into the system, this flow must be accommodated and the design capacity must be increased accordingly to take care of this flow (Plate 1.50d).

R0071478

Table 1.50a

WATER REMOVAL RATES FOR SLOPING LAND

Land Slope	Water Removal Rate
2 - 5%	1.65 cfs/1000 ft.
6 - 12%	1.80 cfs/1000 ft.
> 12%	1.95 cfs/1000 ft.

Size of Drains

Subsurface drains should be sized for the required capacity using Plates 1.50f to 1.50h in Appendix 1.50A. The minimum diameter for a subsurface drain shall be 4 inches.

Depth and Spacing

Relief drains - Relief drains installed in a uniform pattern should have equal spacing between drains and the drains should be at the same depth. Maximum depth is limited by the allowable load on the pipe, depth to impermeable layers in the soil, and outlet requirements. The minimum depth is 24 inches under normal conditions. Twelve inches is acceptable where the drain will not be subject to equipment loading or frost action. Spacing between drains is dependent on soil permeability and the depth of the drain. In general, however, a depth of 3 feet and a spacing of 50 feet will be adequate. A more economical system may be designed, if the necessary information is available, by using the equations found in Appendix 1.50A.

Interceptor drain - The depth of installation of an interceptor drain is influenced mainly by the depth to which the water table is to be lowered. The maximum depth is limited by the allowable load on the pipe and the depth to an impermeable layer. Minimum depth should be the same as for relief drains.

One interceptor drain is usually sufficient. However, if multiple drains are to be used, determining the required spacing can be difficult. The best approach is to install the first drain--then if seepage or high water table problems occur downslope, install an additional drain a suitable distance downslope. This distance can be calculated from equations found in Appendix 1.50A.

Velocity and Grade

The minimum velocity required to prevent silting is 1.4 ft./sec. The line should be graded to achieve at least this velocity. Steep grades should be avoided, however. Table 1.50b lists maximum velocities for various soil textures.

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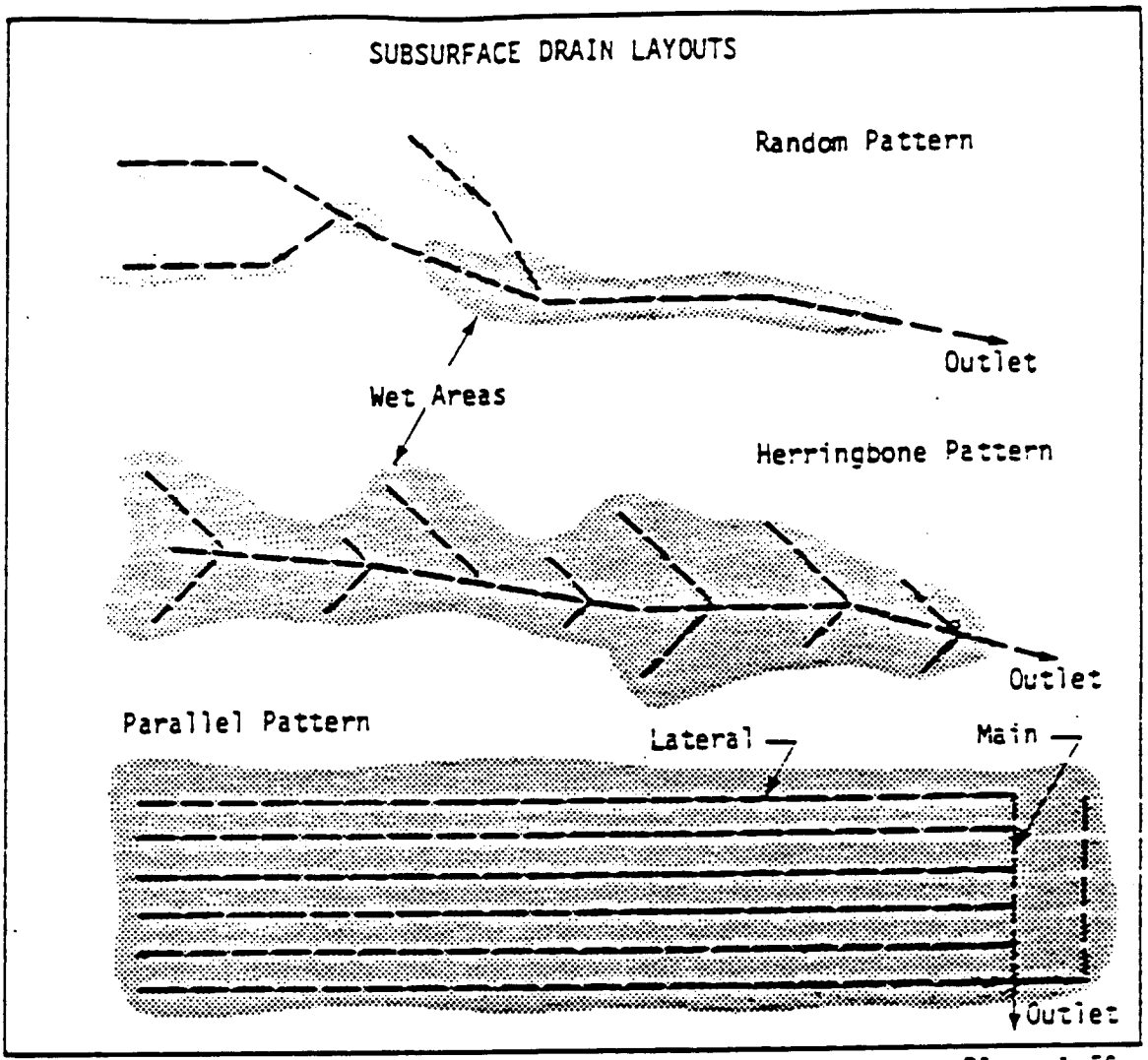
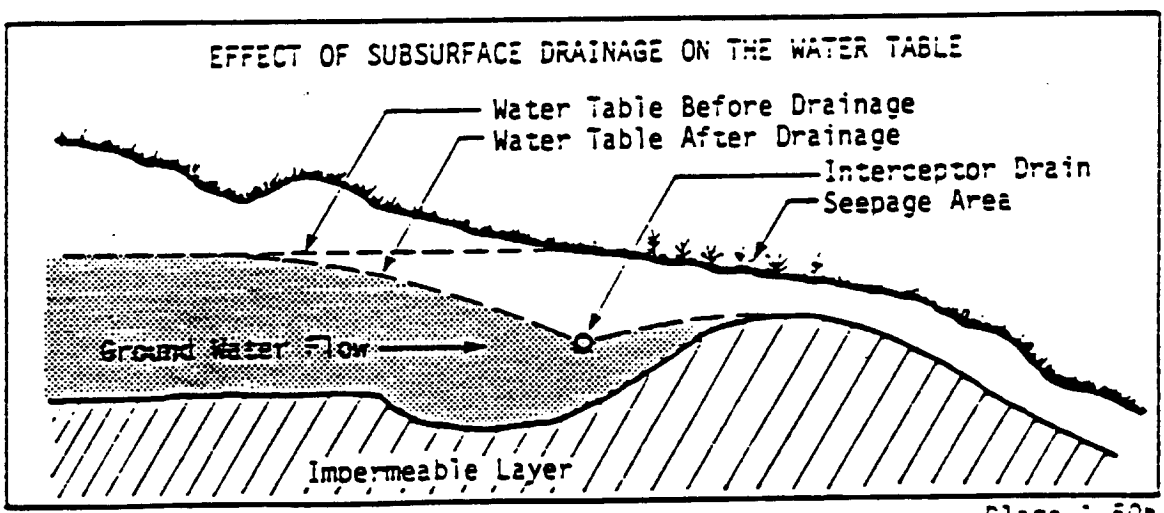


Source: USDA-SCS

Plate 1.50a



Source: USDA-SCS

Plate 1.50b

Table 1.50b

MAXIMUM VELOCITIES FOR VARIOUS SOIL TEXTURES

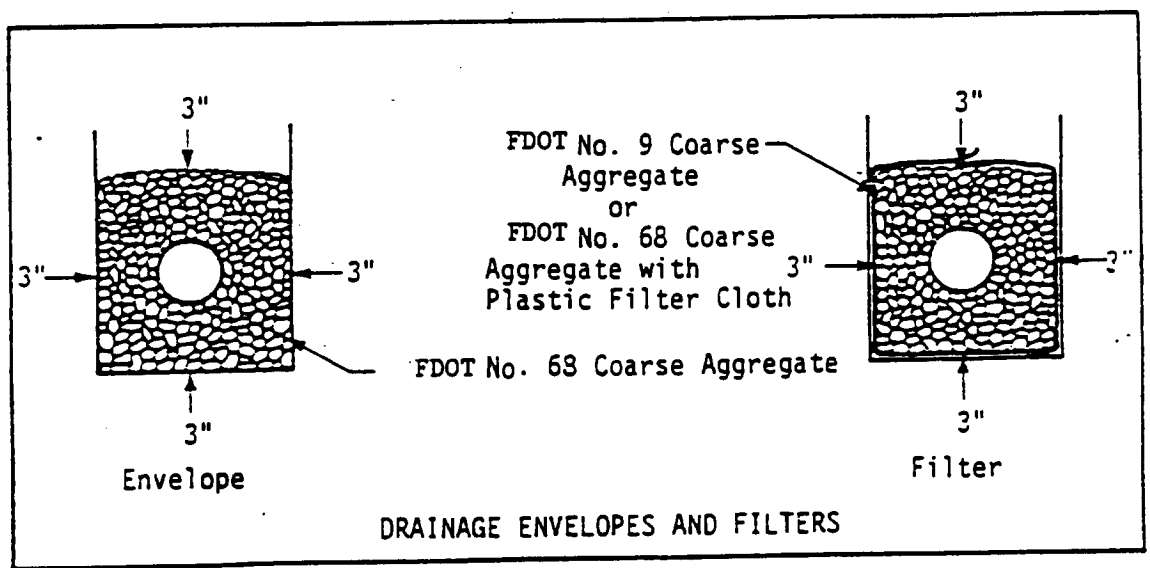
Soil Texture	Maximum Velocity - ft./sec.
Sandy and Sandy Loam	3.5
Silt and Silt Loam	5.0
Silty Clay Loam	6.0
Clay and Clay Loam	7.0
Coarse Sand or Gravel	9.0

Envelopes and Filters

Envelopes or filters shall be used around all drains for proper bedding and improved flow of groundwater into the drain. The envelope shall consist of 3 inches of FDOT No. 68 aggregate placed completely around the drain (see Plate 1.50c).

Where high concentrations of silt and fine sand are encountered, a filter should be used instead of an envelope. The filter shall consist of 3 inches of FDOT No. 9 aggregate placed completely around the drain.

Plastic filter clothes can be used instead of granular filters. Filter cloths should be used with a gravel envelope as shown in Plate 1.50c.



DRAINAGE ENVELOPES AND FILTERS

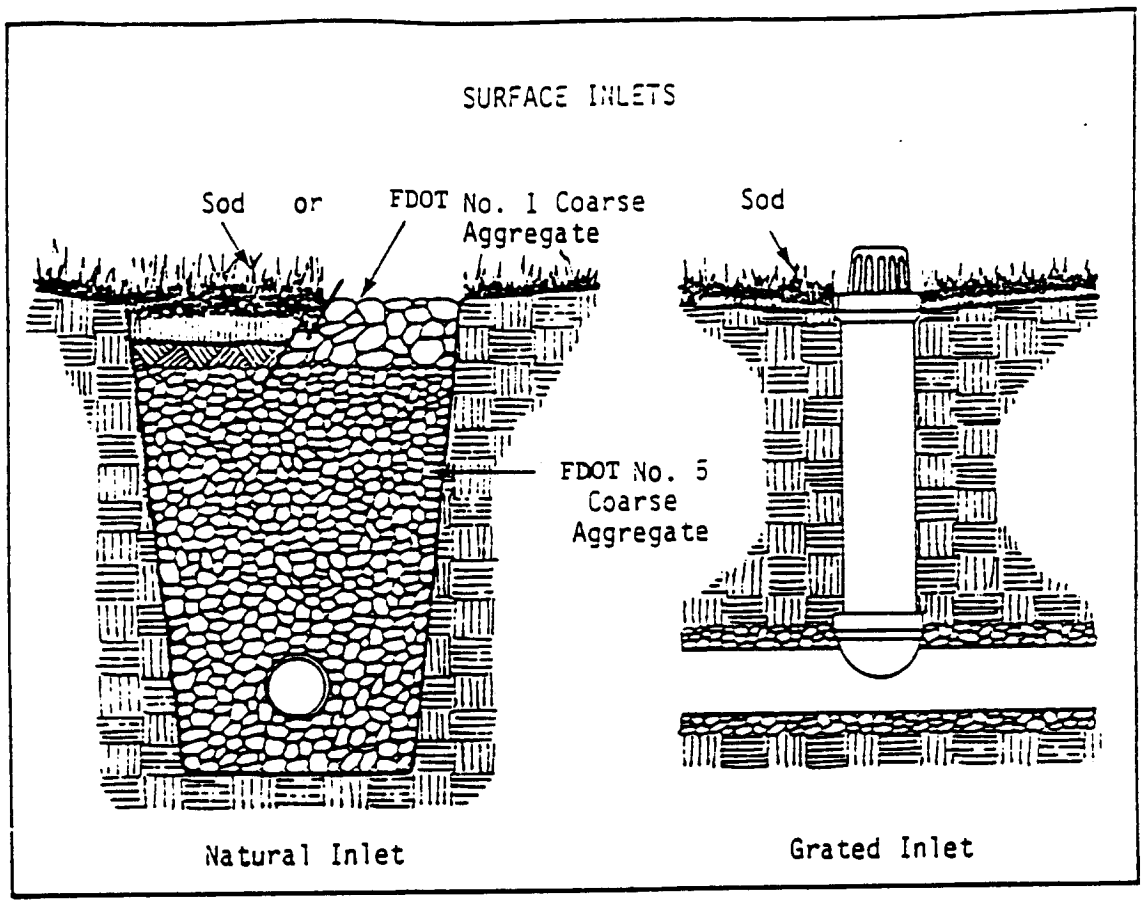
Source: USDA-SCS

Plate 1.50c

Surface Water

Plate 1.50d shows two types of surface water inlets. The grated inlet should not be used where sediment might be a problem.

R0071481



Source: USDA-SCS

Plate 1.50d

Outlet

The outlet of the subsurface drain shall empty into a stabilized channel or other watercourse which will remove the water from the outlet. It shall be above the mean water level in the receiving channel. It shall be protected from erosion, undermining, damage from periods of submergence, and the entry of small animals into the drain.

The outlet shall consist of a 10-foot section of corrugated metal, cast iron, or steel pipe without perforations. No envelope material shall be used around the pipe. At least two-thirds of the outlet pipe length shall be buried.

Materials

Acceptable materials for subsurface drains include perforated, continuous closed-joint conduits of corrugated plastic, concrete, corrugated metal, asbestos cement, and bituminized fiber. The strength and durability of the pipe shall meet the requirements of the site in accordance with the manufacturer's specifications.

R0071482

Construction Specifications

1. The trench shall be constructed on a continuous grade with no reverse grades or low spots.

2. Soft or yielding soils under the drain shall be stabilized with gravel or suitable material.

3. Deformed, warped, or otherwise unsuitable pipe shall not be used.

4. Envelopes or filter material shall be placed as specified with at least 3 inches of material on all sides of the pipe.

5. Backfilling shall be done immediately after placement of the pipe. No sections of pipe should remain uncovered overnight or during a rainstorm. Backfill material shall be placed in the trench in such a manner that the drain pipe is not displaced or damaged.

6. The outlet section of the drain shall consist of at least 10 feet of non-perforated corrugated metal, cast iron or steel pipe. At least two-thirds of its length shall be buried.

Maintenance

1. Subsurface drains should be checked periodically to insure that they are free-flowing and not clogged with sediment.

2. The outlet should be kept clean and free of debris.

3. Surface inlets should be kept open and free of sediment and other debris.

4. Trees located too close to a subsurface drain often clog the system with their roots. If a drain becomes clogged, relocate the drain or remove the trees.

5. Where drains are crossed by heavy vehicles, the line should be checked to insure that it is not crushed.

R0071483

APPENDIX 1.50A

Subsurface drains are not generally designed to flow under pressure and the hydraulic gradient is parallel with the grade line. Consequently, the flow is considered to be open channel and Manning's Equation can be used. The required drain size can be determined by the following procedure:

1. Determine the flow the drain must carry.
2. Determine the gradient of the drain.
3. From Table 1.50c, determine n for the type of drain pipe to be used. Choose the correct Plate 1.50e-1.50g for the n just determined.
4. Enter the appropriate plate with the gradient of the pipe and the flow in the pipe. The intersection of the two lines must be to the right of the line for 1.4 ft./sec. If it is not, increase the gradient or flow capacity or both.

Example 1

Given:

A random subsurface drain is to be installed on a 1.0% grade, 700 feet in length, and using corrugated plastic pipe.

Calculate:

The required size of the drain pipe.

Solution:

From the Std. and Spec., the required capacity of the pipe is 1.5 $ft.^3/sec.$ 1000 ft.

$$\text{Capacity} = \frac{700}{1000} \times 1.5\ ft.^3/sec.\quad 1.05\ ft.^3/sec.$$

From Table 1.50c, n = 0.015 for corrugated plastic pipe.

From Plate 1.50f, choose an 8-inch pipe.

Example 2

Given:

A relief drain installed in a gridiron pattern, of 8 laterals, 500 feet long, 0.5% grade, and 50 feet on centers. A main 400 feet in length on a 0.5% grade will connect to the laterals. Use bituminized fiber pipe for the main and laterals.

Calculate:

The required size of the drain pipe.

R0071484

Solution:

The drainage area for each lateral is 25 feet on either side of the pipe times the length, therefore,

$$\frac{50 \text{ ft.} \times 500 \text{ ft.}}{43{,}560 \text{ ft.}^2/\text{acre}} = 0.57 \text{ acre}$$

From the Std. & Spec., the drains must remove 1 inch of water in 24 hours or 0.042 $ft.^3/sec./acre$.

$$0.042 \text{ ft.}^3/\text{sec./acre} \times 0.57 \text{ acre} = 0.02 \text{ ft.}^3/\text{sec.}$$

From Table 1.50c, n = 0.013 for bituminized fiber pipe.

From Plate 1.50e, a 4-inch pipe must be used for the laterals.

The first 25 feet of the main will drain 25 feet on either side of the pipe. The remaining 375 feet will drain only 25 feet on the side opposite from the laterals. In addition, the main will drain the laterals.

Drainage from the main:

$$\frac{25 \text{ ft.} \times 50 \text{ ft.}}{43{,}560 \text{ ft.}^2/\text{acre}} + \frac{375 \text{ ft.} \times 25 \text{ ft.}}{43{,}560 \text{ ft.}^2/\text{acre}} = 0.24 \text{ acre}$$

Drainage from laterals:

$$8 \times 0.57 \text{ acre} = 4.56 \text{ acre}$$

$$\text{Total} = 0.24 + 4.56 = 4.8 \text{ acre}$$

Required capacity:

$$0.042 \text{ ft.}^3/\text{sec./acre} \times 4.8 \text{ acre} = 0.20 \text{ ft.}^3/\text{sec.}$$

From Plate 1.50e, choose a 5-inch pipe for the main.

Table 1.50c

"n" VALUES FOR SUBSURFACE DRAIN PIPES

Composition of Pipe or Tubing	"n" Values
Asbestos Cement	0.013
Bituminized Fiber	0.013
Concrete	0.015
Corrugated Plastic	0.015
Corrugated Metal	0.025

R0071485

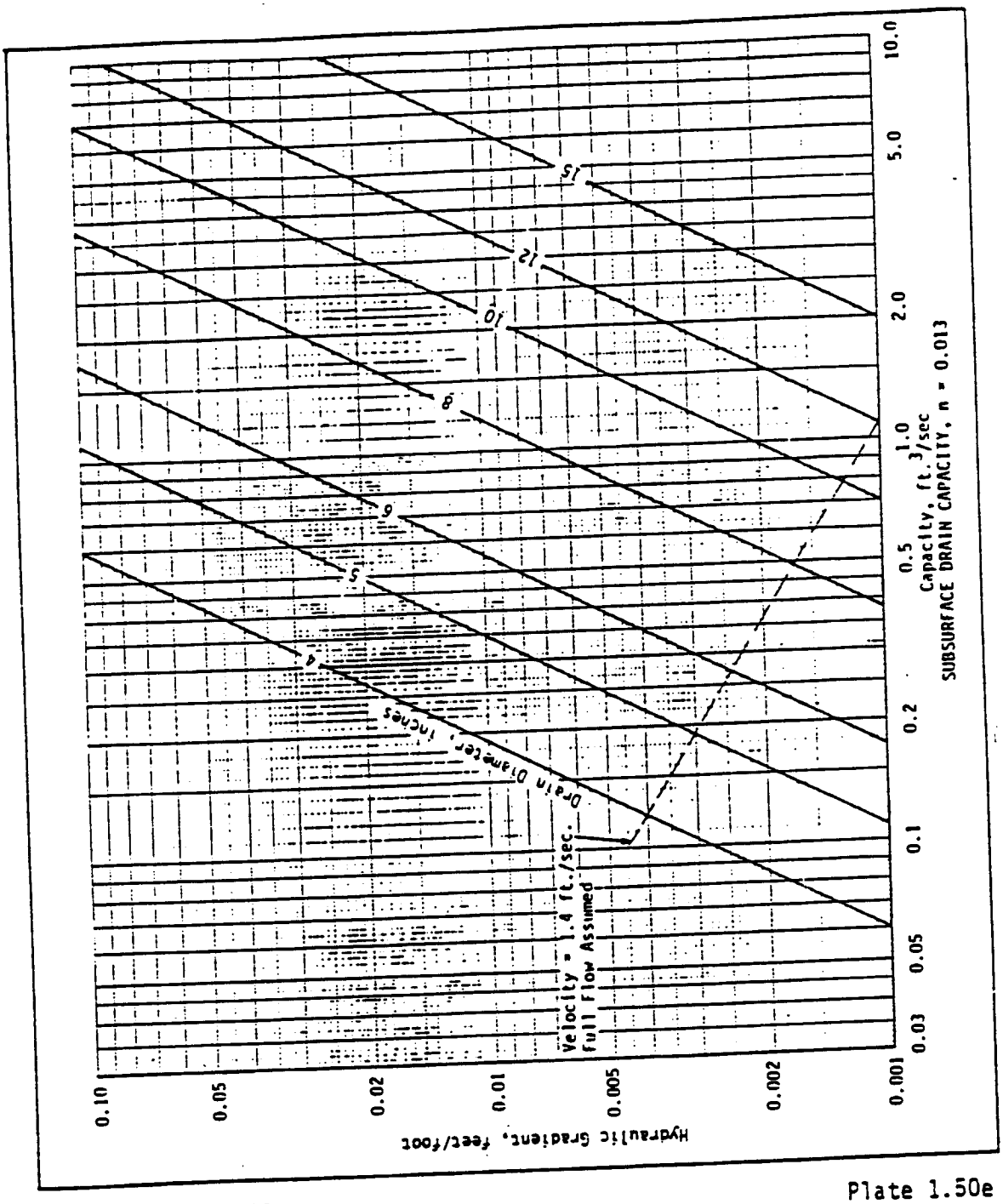


Plate 1.50e

Source: USDA-SCS

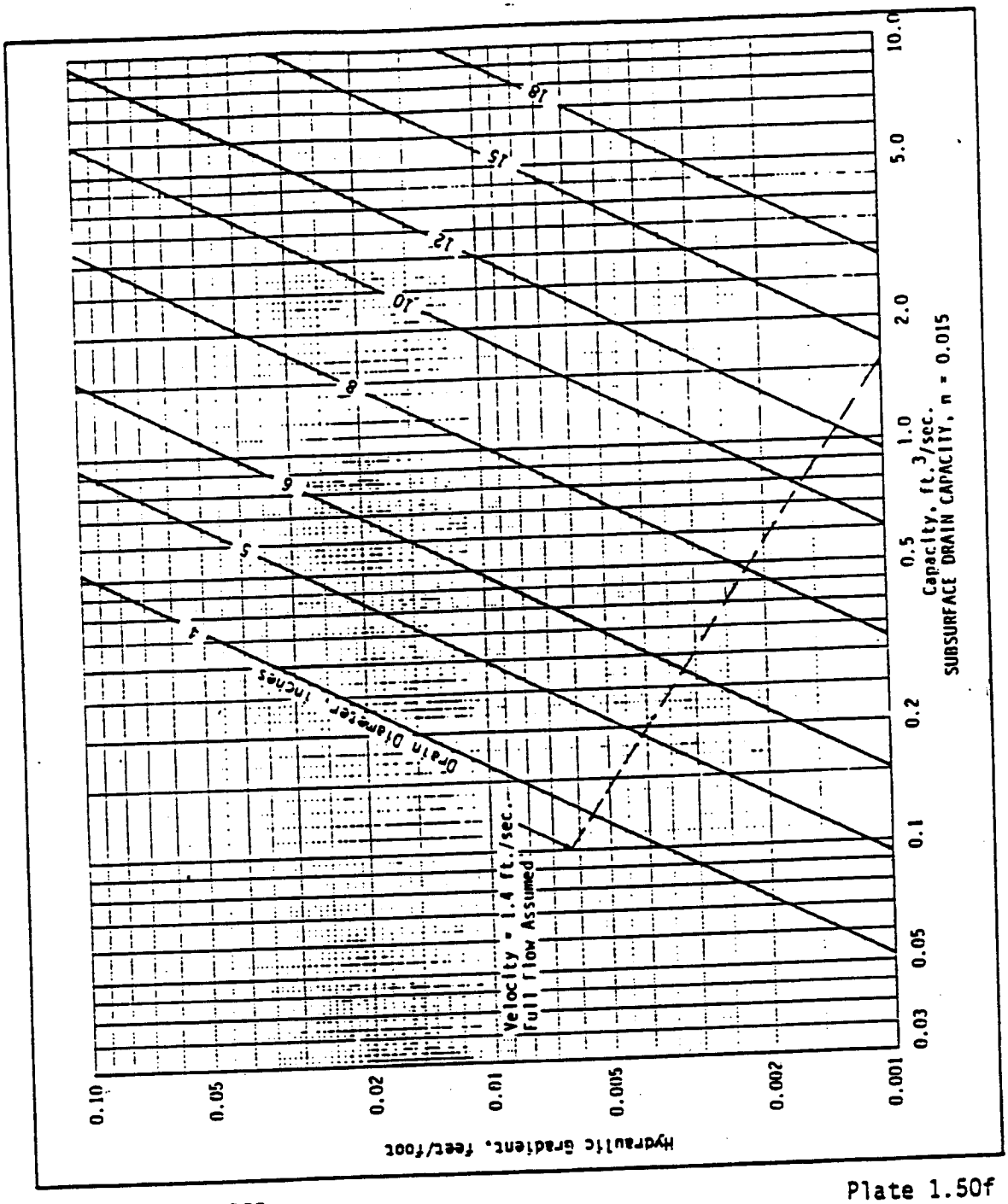
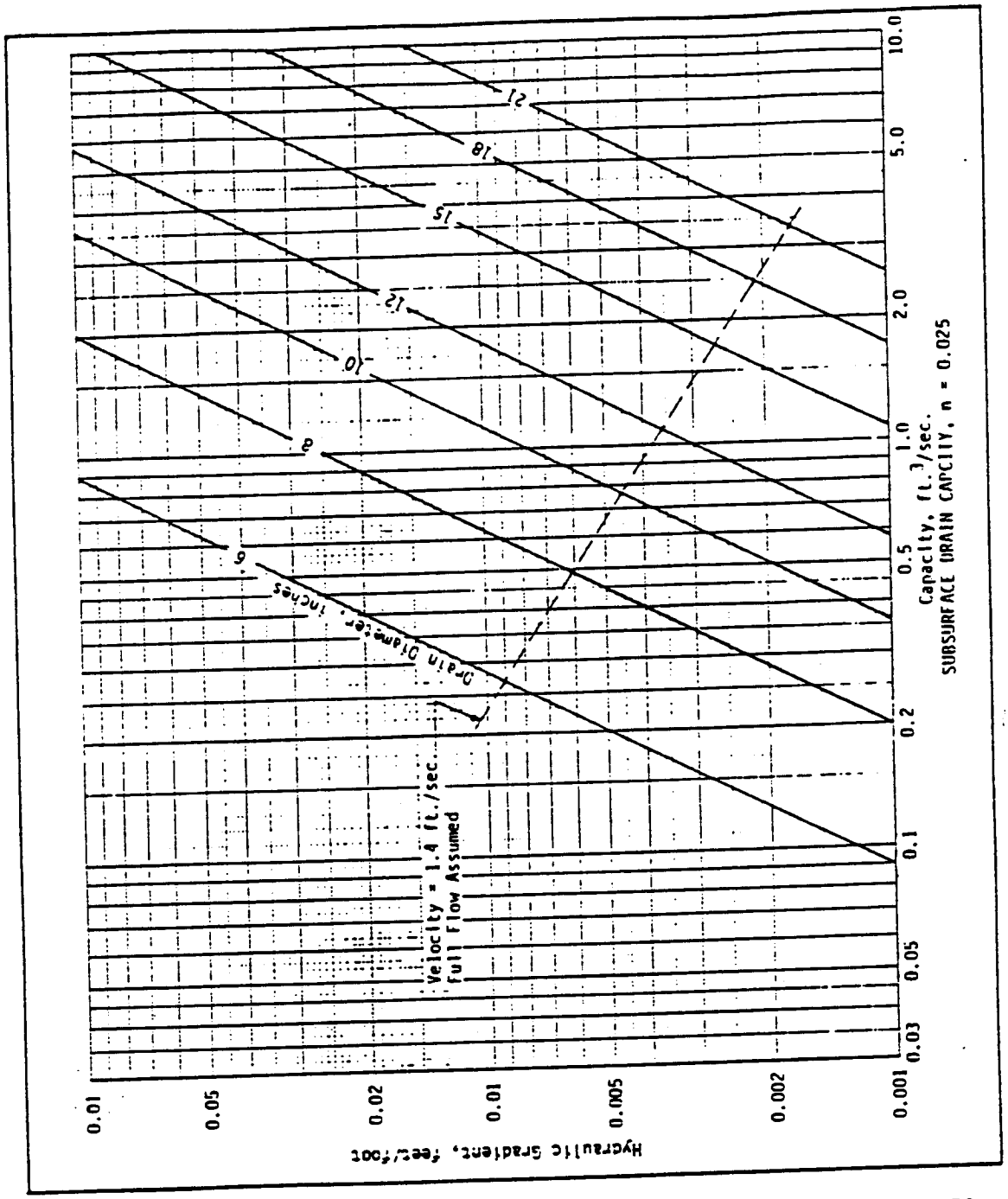


Plate 1.50f

Source: USDA-SCS

R0071487



Source: USDA-SCS

Plate 1.50g

R0071488

Spacing of Relief Drains

If the necessary information is known, the following equation can be used to calculate drain spacing in lieu of the recommended standard:

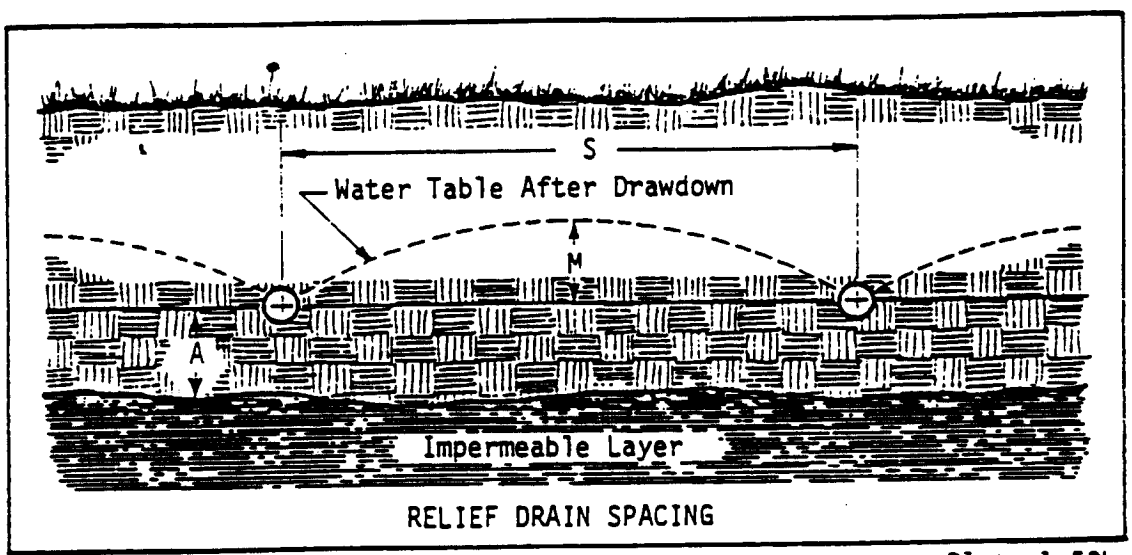
$$S = \sqrt{\frac{4k\ (M^2 + 2\ AM)}{q}}$$

where,

S = drain spacing, feet.
k = average hydraulic conductivity, in./hr. (For practical purposes, hydraulic conductivity is equal to permeability).
M = vertical distance, after drawdown, of water table above drain at mid-point between lines, feet.
A = depth of barrier below drain, feet.
q = drainage coefficient, rate of water removal, in./hr.

Also, see Plate 1.50h.

Limitations of the equation are listed in the SCS National Engineering Handbook, Section 16, Drainage of Agricultural Land (53).



RELIEF DRAIN SPACING

Source: USDA-SCS

Plate 1.50h

Spacing of Interceptor Drains

If one interceptor drain is not sufficient, the spacing of multiple drains can be calculated by the following equation:

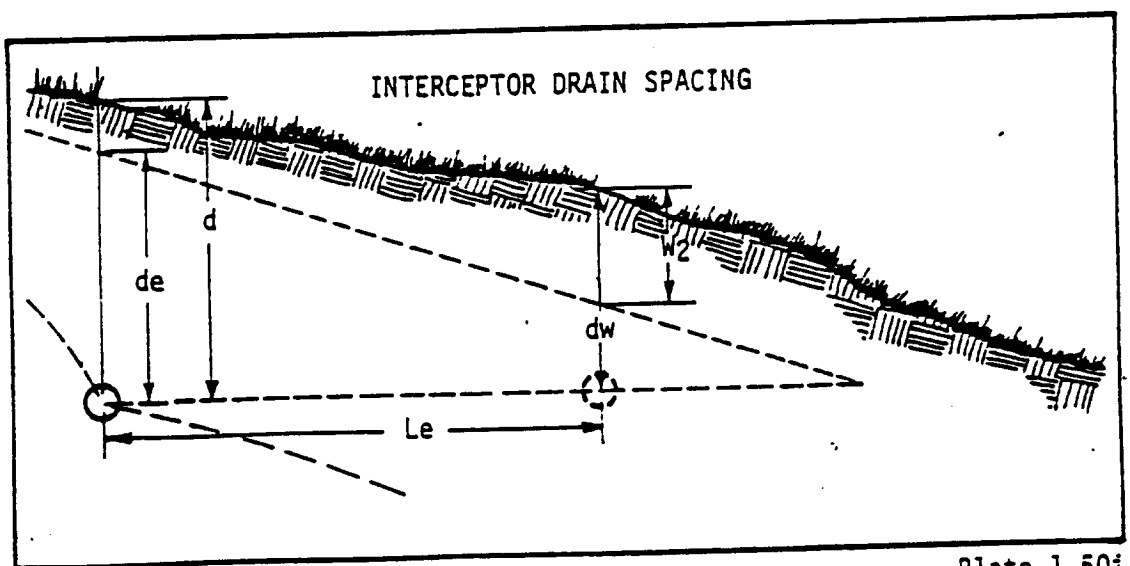
$$Le = \frac{ki}{q} (de - dw + W_2)$$

where,

Le = the distance downslope from the drain to the point where the water table is at the desired depth after drainage, feet. The second drain should be located at this point.
k = the average hydraulic conductivity of the subsurface profile to the depth of the drain, in./hr.
q = drainage coefficient, rate of water removal, in./hr.
i = the hydraulic gradient of the water table before drainage, feet/foot.
de = the effective depth of the drain, feet.
dw = the desired minimum depth to water table after drainage, feet.
W_2 = the distance from the ground surface to the water table, before table, before drainage, at the distance (Le) downslope from the drain, feet.

Also see Plate 1.50i.

Further information on this equation can be obtained from the SCS National Engineering Handbook, Section 16, Drainage of Agricultural Land (53).



Source: USDA-SCS

Plate 1.50i

R0071490

ES BMP 1.60

SURFACE ROUGHENING

Definition

Providing a rough soil surface with horizontal depressions created by operating a tillage or other suitable implement on the contour, or by leaving slopes in a roughened condition by not fine-grading them.

Purposes

1. To aid in establishment of vegetative cover with seed.
2. To reduce runoff velocity and increase infiltration.
3. To reduce erosion and provide for sediment trapping.



R0071491

Conditions Where Practice Applies

1. All slopes steeper than 3:1 require surface roughening, either stair-step grading, grooving, furrowing, or tracking if they are to be stabilized with vegetation.

2. Areas with grades less steep than 3:1 should have the soil surface lightly roughened and loose to a depth of 2 to 4 inches prior to seeding.

3. Areas which have been graded and will not be stabilized immediately may be roughened to reduce runoff velocity until seeding takes place.

4. Slopes with a stable rock face do not require roughening or stabilization.

Planning Considerations

Grades areas with smooth, hard surfaces give a false impression of "finished grading" and a job well done. It is difficult to establish vegetation on such surfaces due to reduced water infiltration and the potential for erosion. Rough slope surfaces with uneven soil and rocks left in place may appear unattractive or unfinished at first, but encourage water infiltration, speed the establishment of vegetation, and decrease runoff velocity.

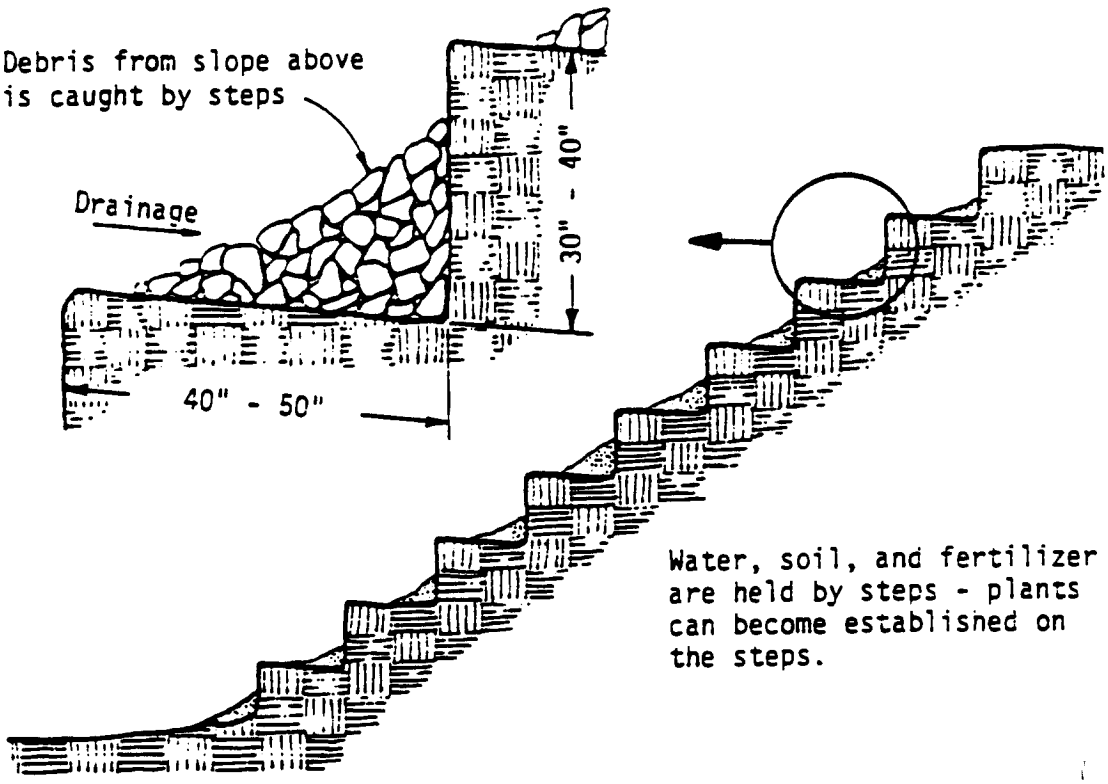
Rough, loose soil surfaces give lime, fertilizer and seed some natural coverage. Niches in the surface provide microclimates which generally provide a cooler and more favorable moisture level than hard flat surfaces; this aids seed germination.

There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate methods depends upon the type of slope. Roughening methods include stair-step grading, grooving, and tracking. Factors to be considered in choosing a method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

1. Disturbed areas which will not require mowing may be stair-step graded, grooved, or left rough after filling.

2. Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material which sloughs from above, and provides a level site where vegetation can become established.

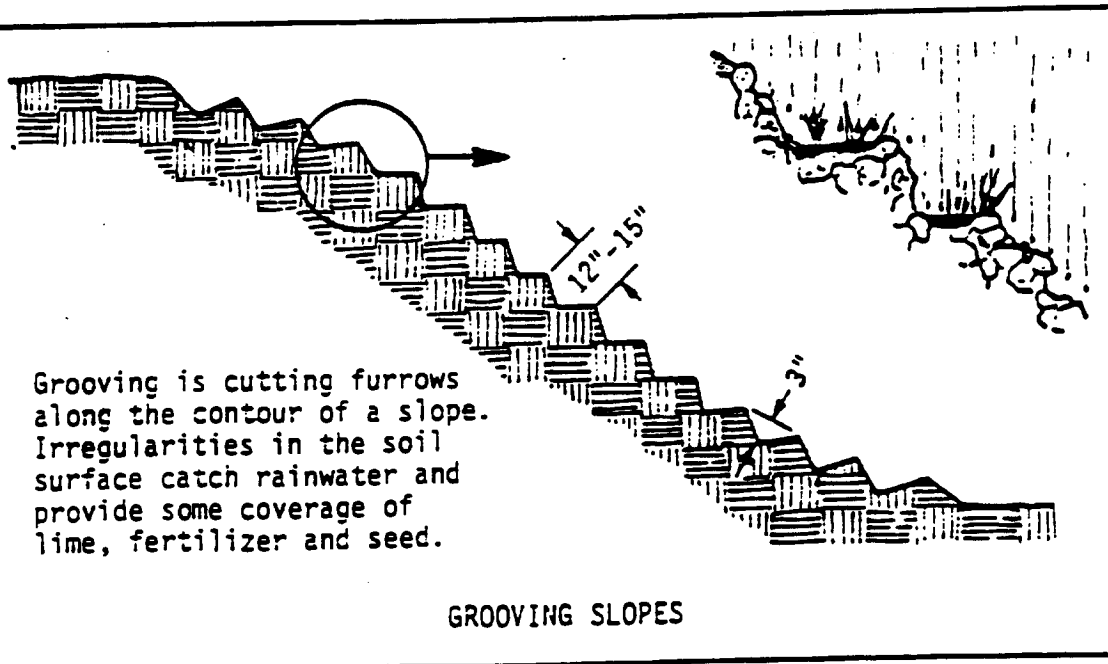
R0071492



STAIR STEPPING CUT SLOPES

Source: Va SWCC

Plate 1.60a



GROOVING SLOPES

Source: Va SWCC

Plate 1.60b

R0071493

3. Areas which will be mowed (these areas should have slopes less steep than 3:1) may have small furrows left by discing, harrowing, raking or seed-planting machinery operated on the contour.

4. It is important to avoid excessive compacting of the soil surface when scarifying. Tracking with bulldozer treads is preferable to not roughening at all, but is not as effective as other forms of roughening, as the soil surface is severely compacted and runoff is increased.

Specifications

Cut Slope Applications for Areas Which Will Not Be Mowed

Cut slopes with a gradient steeper than 3:1 shall be stair-step graded or grooved (Plate 1.60a and 1.60b).

1. Stair-step grading may be carried out on any material soft enough to be ripped with a bulldozer. Slopes consisting of soft rock with some subsoil are particularly suited to stair-step grading.

   The ratio of the vertical cut distance to the horizontal distance shall be less than 1:1 and the horizontal portion of the "step" shall slope toward the vertical wall.

   Individual vertical cuts shall not be more than thirty inches on soft soil materials and not more than forty inches in rocky materials.

2. Grooving consists of using machinery to create a series of ridges and depressions which run perpendicular to the slope (on the contour).

   Grooves may be made with an appropriate implement which can be safely operated on the slope and which will not cause undue compaction. Suggested implements include discs, tillers, spring harrows, and the teeth on a front-end loader bucket. Such grooves shall not be less than three inches deep nor further than fifteen inches apart.

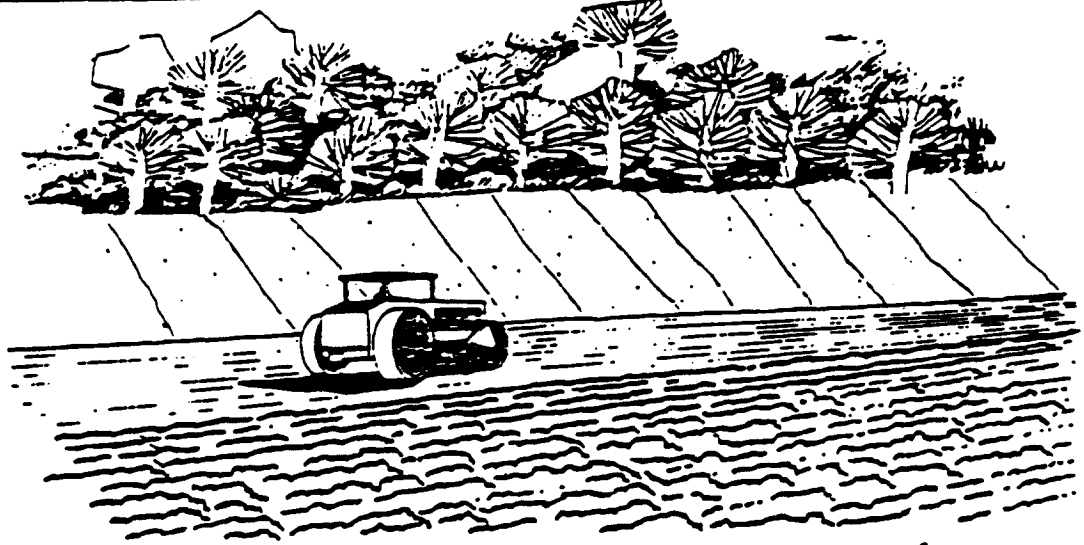
Fill Slope Applications For Areas Which Will Not Be Mowed

Fill slopes with a gradient steeper than 3:1 shall be grooved or allowed to remain rough as they are constructed. Method (1) or (2) below may be used:

1. Groove according to #2, above.

2. As lists of the fill are constructed, soil and rock materials may be allowed to fall naturally onto the slope surface (Plate 1.60c).

Colluvial materials (soil deposits at the base of slopes or from old stream beds) shall not be used in fills as they flow when saturated.

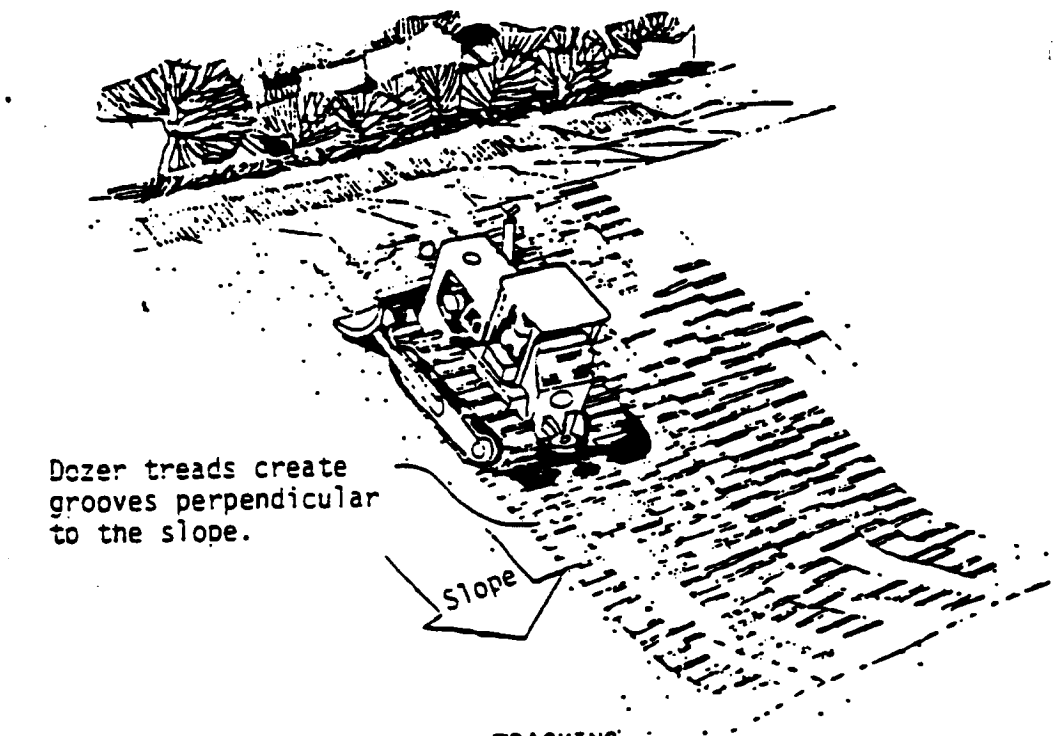


Each lift of the fill is compacted, but the outer face of the slope is allowed to remain loose so that the rocks, clods, etc. reach the natural angle of repose.

FILL SLOPE TREATMENT

Source: Va SWCC

Plate 1.60c



TRACKING

Source: Michigan Soil Erosion and Sedimentation Control Guidebook

Plate 1.60d

R0071495

At no time shall slopes be bladed or scraped to produce a smooth, hard surface.

Cuts, Fills, and Graded Areas Which Will Be Mowed

Mowed slopes should not be steeper than 3:1. Excessive roughness is undesirable where mowing is planned.

These areas may be roughened with shallow grooves such as remain after tilling, discing harrowing, raking, or use of a cultipacker-seeder. The final pass of any such tillage implement shall be on the contour (perpendicular to the slope).

Grooves formed by such implements shall not be less than one inch deep and not further than twelve inches apart.

Fill slopes which are left rough as constructed may be smoothed with a dragline or pickchain to facilitate mowing.

Roughening With Tracked Machinery (Plate 1.60d)

Roughening with tracked machinery on clayed soils is not recommended unless no alternatives are available. Undue compaction of surface soil results from this practice. Sandy soils do not compact severely, and may be tracked. In no case is tracking as effective as the other roughening methods described.

When tracking is the chosen surface roughening technique, it shall be done by operating tracked machinery up and down the slope to leave horizontal depressions in the soil. As few passes of the machinery should be made as possible to minimize compaction.

Seeding

Roughened areas shall be seeded and mulched as soon as possible to obtain optimum seed germination and seedling growth.

R0071496

ES BMP 1.61

TOPSOILING

Definition

Methods of preserving and using topsoil to enhance final site stabilization with vegetation.

Purpose

To provide a suitable growth medium for final site stabilization with vegetation.

Conditions Where Practice Applies

1. Where the preservation or importation of topsoil is determined to be the most effective method of providing a suitable growth medium.

2. Where the subsoil or existing soil presents the following problems:

   a. The texture, pH, or nutrient balance of the available soil cannot be modified by reasonable means to provide an adequate growth medium.
   b. The soil material is too shallow to provide an adequate root zone and to supply necessary moisture and nutrients for plant growth.
   c. The soil contains substances potentially toxic to plant growth.



R0071497

3. Where high-quality turf is desirable to withstand intense use or meet aesthetic requirements.

4. Where ornamental plants will be established.

5. Only on slopes that are 2:1 or flatter.

Planning Considerations

Topsoil is the surface layer of the soil profile, generally characterized as being darker than the subsoil due to the presence of organic matter. It is the major zone of root development, carrying much of the nutrients available to plants, and supplying a large share of the water used by plants.

Although topsoil provides an excellent growth medium, there are disadvantages to its use. Stripping, stockpiling, and reapplying topsoil, or importing topsoil, may not always be cost-effective. Topsoiling can delay seeding or sodding operations, increasing the exposure time of denuded areas. Most topsoil contains weed seeds, and weeds may compete with desirable species.

Advantages of topsoil include its high organic matter content and friable consistence, water-holding capacity, and nutrient content.

In site planning, the option of topsoiling should be compared with that of preparing a seedbed in subsoil. The clay content of subsoils does provide high moisture availability and deter leaching of nutrients, and when properly limed and fertilized, subsoils may provide a good growth medium which is generally free of weed seeds.

Topsoiling is strongly recommended where ornamental plants or high-maintenance turf will be grown. Topsoiling is a required procedure when establishing vegetation on shallow soils, soils containing potentially toxic materials, and soils of critically low pH (high acid) levels.

If topsoiling is to be done, the following items should be considered:

1. Whether an adequate volume of topsoil exists on the site. Topsoil will be spread at a compacted depth of 2-4 inches.

2. Location of the topsoil stockpile so that it meets specifications and does not interfere with work on the site.

3. Allow sufficient time in scheduling for topsoil to be spread and bonded prior to seeding, sodding, or planting.

4. Care must be taken not to apply topsoil to subsoil if the two soils have contrasting textures. Clayey topsoil over sandy subsoil is a particularly poor combination, as water creeps along the junction between the soil layers and causes the topsoil to slough.

5. If topsoil and subsoil are not properly bonded, water will not infiltrate the soil profile evenly and it will be difficult to establish vegetation.

R0071498

Specifications

Materials

Field exploration of the site should be made to determine if there is sufficient surface soil of good quality to justify stripping. Topsoil should be friable and loamy (loam, sandy loam, silt loam, sandy clay loam, clay loam). It should be free of debris, trash, stumps, rocks, roots, and noxious weeds, and should give evidence of being able to support healthy plant growth.

Stripping

Stripping should be confined to the immediate construction area. A 4- to 6- inch stripping depth is common, but depth may vary depending on the particular soil. All perimeter dikes, basins, and other sediment controls shall be in place prior to stripping.

Stockpiling

Topsoil shall be stockpiled in such a manner that natural drainage is not obstructed and no off-site sedimentation occurs. Stockpiles should be planned so as not to interfere with any of the construction operations. Stockpiles can also act as barriers to shield the construction site from the neighborhood and adjacent landowners. They will also help to reduce the amount of dust and noise coming from the site.

Side slopes of the stockpile shall not exceed 2:1.

A perimeter dike with gravel outlet, silt fence, or straw bale barrier shall surround all topsoil stockpiles.

Temporary seeding of stockpiles shall be completed within 15 days of the formation of the stockpile, in accordance with TEMPORARY SEEDING (ES BMP 1.65).

Site Preparation Prior to and Maintenance During Topsoiling

Before topsoiling, establish needed erosion and sediment control practices such as diversions, grade stabilization structures, berms, dikes, level spreaders, waterways, sediment basins, etc. These practices must be maintained during topsoiling.

Grading: Previously established grades on the areas to be topsoiled shall be maintained according to the approved plan.

Liming: Where the pH of the subsoil is 6.0 or less, or the soil is composed of heavy clays, agricultural limestone shall be spread in accordance with the soil test or the vegetative establishment practice being used.

R0071499

Bonding: After the areas to be topsoiled have been brought to grade, and immediately prior to dumping and spreading the topsoil, the subgrade shall be loosened by discing or scarifying to a depth of at least 2 inches to insure bonding of the topsoil and subsoil.

Applying Topsoil

Topsoil shall not be placed while in a muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed sodding or seeding. The topsoil shall be uniformly distributed to a minimum compacted depth of 2 inches on 3:1 or steeper slopes and 4 inches on flatter slopes. (See Table 1.61a to determine volume of topsoil required for application to various depths). Any irregularities in the surface, resulting from topsoiling or other operations, shall be corrected in order to prevent the formation of depressions or water pockets.

It is necessary to compact the topsoil enough to ensure good contact with the underlying soil and to obtain a level seedbed for the establishment of high maintenance turf. However, undue compaction is to be avoided as it increases runoff velocity and volume, and deters seed germination. In areas which are not going to be mowed, the surface should be left rough in accordance with SURFACE ROUGHENING (ES BMP 1.60).

Soil Sterilants

No sod or seed shall be placed on soil which has been treated with soil sterilants until sufficient time has elapsed to permit dissipation of toxic materials.

Table 1.61a

CUBIC YARDS OF TOPSOIL REQUIRED FOR APPLICATION TO VARIOUS DEPTHS

Depth (inches)	Per 1,000 Square Feet	Per Acre
1	3.1	134
2	6.2	268
3	9.3	403
4	12.4	537
5	15.5	672
6	18.6	806

R0071500

ES BMP 1.65

TEMPORARY SEEDING

Definition

The establishment of a temporary vegetative cover on disturbed areas by seeding with appropriate rapidly growing annual plants.

Purposes

1. To reduce erosion and sedimentation by stabilizing disturbed areas that will not be brought to final grade for a year or less.

2. To reduce problems associated with mud and dust production from bare soil surfaces during construction.

Conditions Where Practice Applies

Where exposed soil surfaces are not to be fine-graded for periods from 30 days to one year. Such areas include denuded areas, soil stockpiles, dikes, dams, sides of sediment basins, temporary roadbanks, etc.



R0071501

Planning Considerations

Sheet erosion, caused by the impact of rain on bare soil, is the source of most fine particles in sediment. To reduce this sediment load in runoff, the soil surface itself should be protected. The most efficient and economical means of controlling sheet and rill erosion is to establish vegetative cover. Annual plants which sprout rapidly and survive for only one growing season are suitable for establishing temporary vegetative cover.

Temporary seeding may prevent costly maintenance operations on other erosion control systems. For example, sediment basin clean-outs will be reduced if the drainage area of the basin is seeded where grading and construction are not taking place. Perimeter dikes will be more effective if not choked with sediment.

Temporary seeding is essential to preserve the integrity of earthen structures used to control sediment, such as dikes, diversions, and the banks and dams of sediment basins.

Proper seedbed preparation and the use of quality seed are important in this practice just as in permanent seeding. Failure to carefully follow sound agronomic recommendations will often result in an inadequate stand of vegetation that provides little or no erosion control. Temporary measures should be coordinated with permanent vegetation to assure the most economical and efficient control.

Specifications

Prior to seeding, install necessary erosion control practices such as dikes, waterways, and basins.

Plant Selection

Select plants appropriate to the season and site conditions from Table 1.65a.

Seedbed Preparation

To control erosion on bare soil surfaces, plants must be able to germinate and grow. Seedbed preparation is essential. A soil test should be taken to determine liming and fertilization requirements. In the absence of a soil test the following guidelines should be followed:

1. Liming: Where soils are known to be highly acid (pH 5.5 and lower), lime should be applied at the rate of two tons of pulverized agricultural limestone per acre.

2. Fertilizer: Shall be applied as 450 lbs./acre of 10-20-20 (10 lbs./1,000 sq. ft.) or equivalent. Lime and fertilizer shall be incorporated into the top 2 to 4 inches of the soil.

3. Surface Roughening: If the area has been recently loosened or disturbed, no further roughening is required.

R0071502

TABLE 1.65 A

TEMPORARY SEEDING PLANT MATERIALS

Common Name (Botanical Name)	Seeding Rate Acre	Seeding Rate 1000 ft²	Planting Dates NORTH	Planting Dates CENTRAL	Planting Dates SOUTH	Comments
OATS (Avena sativa)	3 Bu (125 lbs)	3 lbs	September-February	September-February	October-February	Will not tolerate flooding, high water table soils.
RYE (Secale cereale)	3 Bu (170 lbs)	4 lbs	September-February	October-February	October-February	Tolerates cold and drought.
WHEAT (Triticum sp)	3 Bu (120 lbs)	3 lbs	September-February	October-February	October-February	
ANNUAL RYEGRASS (Lolium multiflorum)	60 lbs	1.5 lbs	September-February	October-February	October-January	Volunteers may return.
CRIMSON CLOVER (Trifolium incarnatum)	25 lbs	9 oz	September-November	October-November		Annual winter legume. Innoculate seed at 5 times recommended rate. Does poorly on deep dry sands, will not tolerate flooding.
RED CLOVER (Trifolium pratense)	15 lbs	6 oz	September-December	October-December	October-December	Annual winter legume. Innoculate seed at 5 times recommended rate. Grows best on moist soils, will not tolerate flooding. Easily hurt by drought.
WHITE CLOVER (Trifolium repens)	6 lbs	2.5 oz	September-December	October-December	October-December	Annual winter legume. Innoculate seed at 5 times recommended rate. Grows best on moist-wet soils, tolerates some flooding.
ANNUAL SWEETCLOVER (Melilotus altissima)	15 lbs	6 oz	September-December	October-December	October-December	Annual winter legume. Innoculate seed at 3-5 times recommended rate. Grows well on both flatwoods and upland soils. Will not tolerate flooding.
ARROWLEAF CLOVER (Trifolium vesiculosum)	15 lbs	6 oz	September-December	October-December	November-December	Annual winter legume. Innoculate seed at 3-5 times recommended rate. Grow on soil too wet for crimson, tolerates some flooding. Use scarified seed.
LUPINE CLOVER (Lupinus sp.)	60 lbs	1.5 lbs	September-December	October-December	October-December	Annual winter legume. Innoculate seed at 3 times recommended rate. Susceptible to freeze damage at time of emergence. Use scarified seed.
ALFALFA (Medicago sativa)	22 lbs	8 oz	September-December	October-December	October-December	Short lived perennial. Some drought resistance. Grows best on well-drained, fertile soils. Will not tolerate wet soils.
AUSTRIAN WINTER PEAS	45 lbs	1 lb	September-December	October-December	October-December	Grows best on well-drained soils with high clay content.
HAIRY VETCH (Vicia villosa)	25 lbs	9 oz	September-December	October-December	October-December	Grows best on well-drained, loamy soils.
ALYCECLOVER (Alysicarpus vaginalis)	15 lbs	6 ozs	April-July	March-July	March-July	Warm season annual legume. Grows best on well-drained sandy soils.
COMMON LESPEDEZA (Lespideza striata)	30 lbs	11 ozs	March-July	February-July	February-July	Warm season annual. Needs innoculation on eroded soils. Grows best on sandy loams. Fairly drought resistant.
HAIRY INDIGO (Indigofera hirsuta)	8 lbs (120 lbs)	3 ozs	March-July	February-July	February-July	
JOINT VETCH (Aeschynomera americana)	8 lbs	3 ozs	March-August	February-August	February-August	Warm season annual legume. Most suitable of summer legumes for use in low, wet areas.
MILLET (Setaria sp)	30 lbs	11 oz	March-August	March-August	February-August	Warm season annual. Does not tolerate flooding. Grows best in fertile, moist soils. Pearl and Browntop are good varieties to use.
SESBANIA (Sesban macrocarpa)	30 lbs	11 oz	March-July	March-July	February-July	Warm season annual legume. Does well under extremely wet conditions.
SORGHAH-SUDANGRASS HYBRID	30 lbs	11 oz	March-July	March-July	February-July	Warm season annual. Rapid grower. Tolerates dryer soils than millet. Grows best on well-drained soils. Can also use Sudangrass alone.
WEEPING LOVEGRASS (Eragrostis curvula)	5 lbs	2 oz	March-August	March-August	February-August	Short-lived perennial, 2-3 years. Tolerates hot, dry slopes and acid, infertile soils.

Usually mixtures of the above plant materials are better than a single plant alone. Each of the legumes discussed above can be grown in mixture with annual ryegrass and/or the small grains. In a two-crop mixture cut the seeding rate of each crop to one-half of the recommended planting rate when grown alone. Simply three plant types in a mixture requires approximately one-third of the normal seeding rate for each plant. In a three plant mixture containing a single legume, the legume should be planted at one-half of the pure stand seeding rate.

R0071503

When the area is compacted, crusted, or hardened, the soil surface shall be loosened by discing, raking, harrowing, or other acceptable means. (See SURFACE ROUGHENING, ES BMP 1.60).

4. Tracking: Tracking with bulldozer cleats is most effective on sandy soils. This practice often causes undue compaction of the soil surface, especially in clayey soils, and does not aid plant growth as effectively as other methods of surface roughening.

Seeding

Seed shall be evenly applied with a cyclone seeder, drill, cultipacker seeder or hydroseeder. Small grains shall be planted no more than one inch deep. Grasses and legumes shall be planted no more than 1/4 inch deep.

Mulching

1. Mulching should usually be used to reduce damage from water runoff or wind erosion, and to improve moisture conditions for seedlings. Mulching without seeding should be considered for very short term protection. The use of mulch is a judgment decision based on time of seeding and conditions of individual sites. When used, mulch shall be applied according to MULCHING, ES BMP 1.75.

2. Seedings made on slopes in excess of 3:1, or on adverse soil conditions, or during excessively hot or dry weather, shall be mulched according to MULCHING, ES BMP 1.75.

3. Seedings made during optimum spring and summer seeding dates, with favorable soil and site conditions, may not require mulch.

Re-seeding

Areas which fail to establish vegetative cover adequate to prevent rill erosion will be re-seeded as soon as such areas are identified.

R0071504

ES BMP 1.66

PERMANENT SEEDING

Definition

The establishment of perennial vegetative cover on disturbed areas by planting seed.

Purposes

1. To reduce erosion and decrease sediment yield from disturbed areas.
2. To permanently stabilize disturbed areas in a manner that is economical, adaptable to site conditions, and allows selection of the most appropriate plant materials.

Conditions Where Practice Applies

1. Disturbed areas where permanent, long-lived vegetative cover is needed to stabilize the soil.
2. Rough-graded areas which will not be brought to final grade for a year or more.



R0071505

Planning Considerations

Vegetation controls erosion by reducing the velocity and the volume of overland flow and protecting the bare soil surface from raindrop impact.

Areas which must be stabilized after the land has been disturbed require vegetative cover. The most common and economical means of establishing this cover is by seeding grasses and legumes.

Advantages of seeding over other means of establishing plants include the small initial establishment cost, the wide variety of grasses and legumes available, low labor requirement, and ease of establishment in difficult areas.

Disadvantages which must be dealt with are the potential for erosion during the establishment stage, a need to reseed areas that fail to establish, limited periods during the year suitable for seeding, and a need for water and appropriate climatic conditions during germination.

There are so many variables in plant growth that an end product cannot be guaranteed. Much can be done in the planning stages to increase the chances for successful seeding. Selection of the right plant materials for the site, good seedbed preparation, and conscientious maintenance are important.

SELECTING PLANT MATERIALS: The factors affecting plant growth are climate, soils, and topography. In Florida, there are four major physiographic regions that reflect changes in soil and topography. In selecting appropriate plant materials, one should take into account the characteristics of the physiographic region in which the project is located. (See Plate 1.66a).

PHYSIOGRAPHIC REGIONS:

Coastal Plain--Gently to strongly sloping rolling plain underlain by unconsolidated sands, silts and clays. Dominant soils are acid, well drained, finely textured and low in nutrients. Rainfall, perennial streams and groundwater provide an abundance of water although summer droughts occur on sandy soils.

Central Florida Ridge--A gently sloping to rolling sandy ridge underlain by limestone. Land surface is very irregular because of numerous sinkholes and lakes. Dominant soils are acid, well drained, coarse textured and low in nutrients. Rainfall, groundwater, lakes and sinkholes provide ample water although deep sands can become droughty.

Flatwoods--A nearly level plain characterized by swamps, marshes, wetlands and generally high groundwater levels. Dominant soils are acid, poorly drained, coarse textured and low in nutrients. Rainfall, surface water and groundwater provide an abundance of water although drainage activities and urbanization have caused salt water intrusion and water shortages.

R0071506

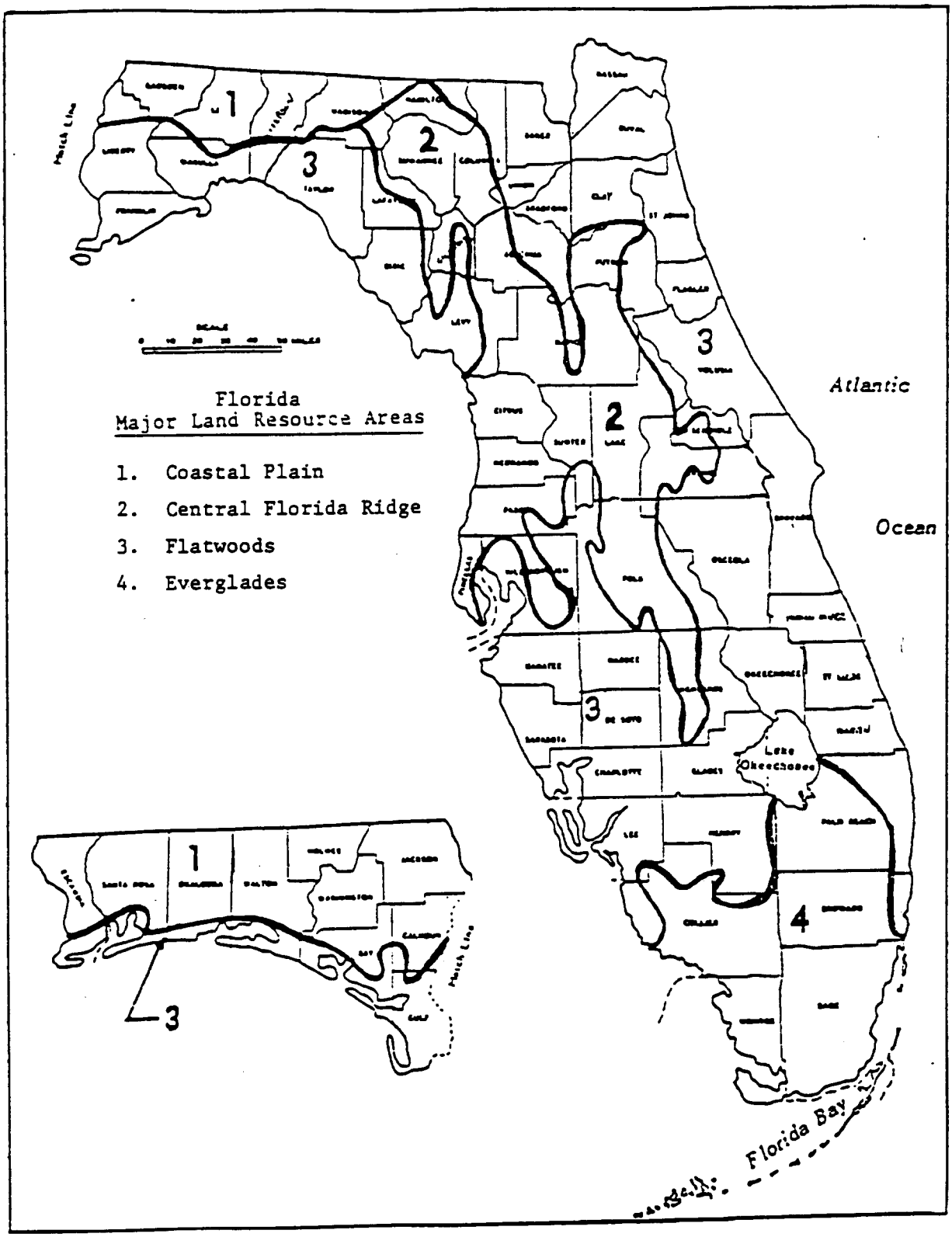


Plate 1.66a

R0071507

Everglades--A level, low coastal primarily composed of swamps, marshes and other wetlands. Dominant soils are poorly drained and range from organic mucks and peats to rockland. Water is abundant and extensive ditching and draining are required to control the groundwater levels. Urbanization and draining of wetlands has created seasonal water shortages and salt water intrusion along the coast.

SOILS: On the whole, soils in Florida always require some nitrogen (N) fertilization to establish plants. Phosphorus (P) and potassium (K) are usually needed. Except for some small pockets of shallow limestone soils, lime is universally needed.

Soils can be modified with lime and fertilizer, but climate cannot be controlled. For this reason, the State has been divided into three major (or five minor) climatic regions for plant selection. (See map, Plate 1.66b).

Microclimate, or localized climate conditions, can affect plant growth. A south-facing slope is drier and hotter than a north-facing slope, and may require drought-tolerant plants. Shaded areas require shade-tolerant plants; the windward side of a ridge will be drier than the leeward, etc.

LAND USE: A prime consideration in selecting which plants to establish is the intended use of land. All of these uses--residential, industrial, commercial, recreational--can be separated into two categories: High-maintenance and low-maintenance.

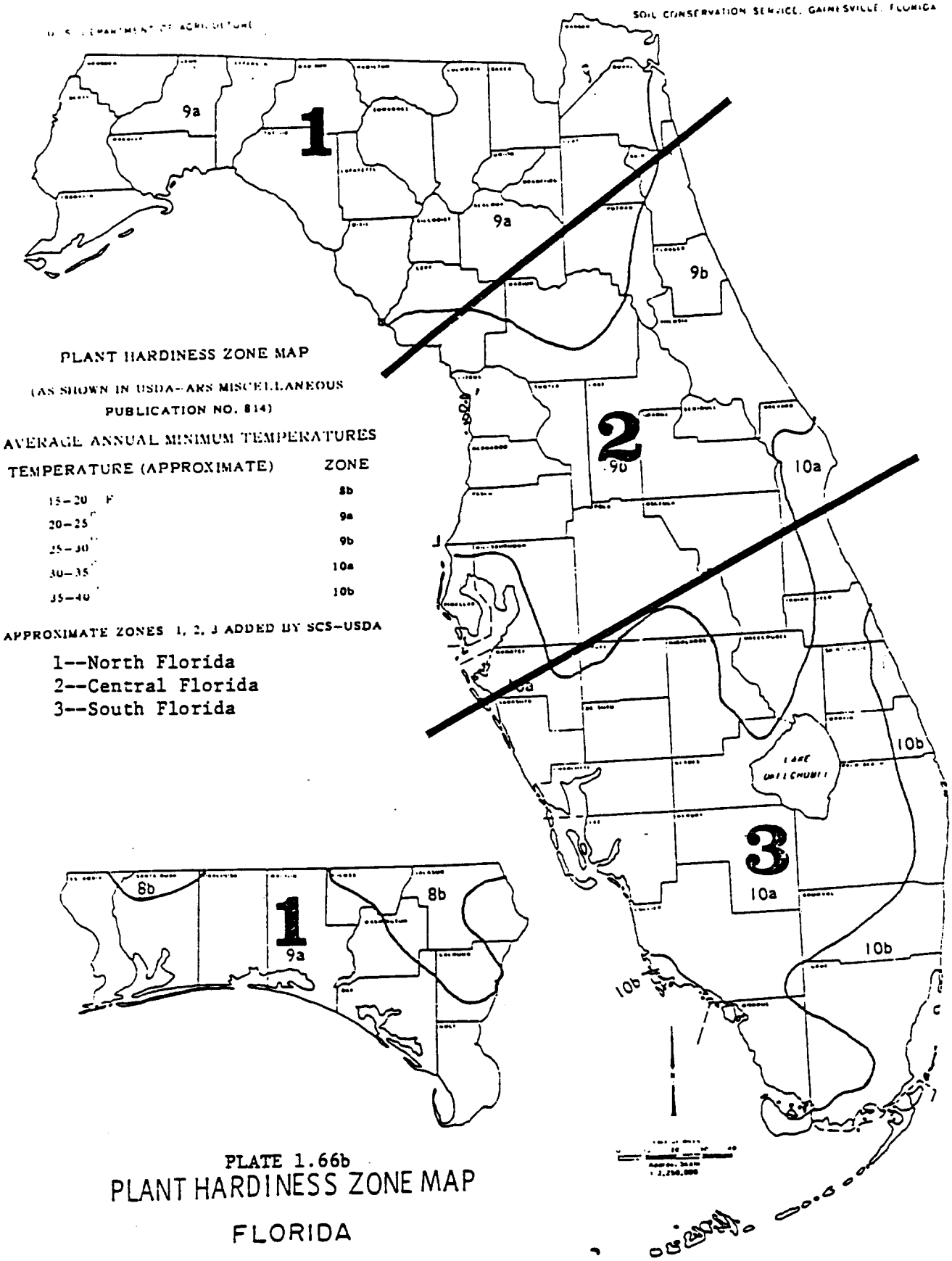
High-maintenance areas will be mowed frequently, limed and fertilized regularly, and will either receive intense use (e.g., athletics) or require maintaining to an aesthetic standard (home lawns). Grasses used for these situations must be fine-leaved and attractive in appearance, able to form tight sod, and be long-lived perennials. They must be well-adapted to the geographic area where they are planted, because constant mowing puts turf under great stress. Sites where high-maintenance vegetative cover is desirable include homes, industrial parks, schools, churches, and some recreational areas.

Low-maintenance areas will be mowed infrequently or not at all; lime and fertilizer may be applied on a regular basis; the areas will not be subjected to intense use, nor required to have a uniform appearance. These plants must be able to persist with little maintenance over long periods of time. Grass and legume mixtures are favored for these sites because legumes are capable of fixing nitrogen from the air for their own use, and the use of the plants around them. Such mixed stands are better able to withstand adverse conditions. Sites that would be suitable for low-maintenance vegetation include steep slopes, stream or channel banks, some commercial properties, and "utility turf" areas such as roadbanks.

SEEDBED PREPARATION - The soil on a disturbed site must be modified to provide an optimum environment for seed germination and seedling growth. The surface soil must be loose enough for water infiltration and root penetration. The pH (acidity and alkalinity) of the soil must be such that it is not toxic and nutrients are available, usually between pH 6.0-7.0. Sufficient nutrients--added as fertilizer--must be present.

R0071508

SOIL CONSERVATION SERVICE, GAINESVILLE, FLORIDA



PLANT HARDINESS ZONE MAP

(AS SHOWN IN USDA--ARS MISCELLANEOUS PUBLICATION NO. 814)

AVERAGE ANNUAL MINIMUM TEMPERATURES	
TEMPERATURE (APPROXIMATE)	ZONE
15–20 °F	8b
20–25	9a
25–30	9b
30–35	10a
35–40	10b

APPROXIMATE ZONES 1, 2, 3 ADDED BY SCS–USDA

1--North Florida
2--Central Florida
3--South Florida

PLATE 1.66b
PLANT HARDINESS ZONE MAP
FLORIDA

R0071509

After seed is in place, it must be protected with a mulch to hold moisture and modify temperature extremes, and to prevent erosion while seedlings are growing.

The addition of lime is equally as important as applying fertilizer. Lime is best known as a pH, or acidity, modifier, but it also supplies calcium and magnesium which are plant nutrients. Its effect on pH makes other nutrients more available to the plant. It can also prevent aluminum toxicity by making aluminum less soluble in the soil.

MAINTENANCE - Even with careful, well planned seeding operations, failures can occur. When it is clear that plants have not germinated on an area or have died, these areas must be reseeded immediately to prevent erosion damage. Healthy vegetation is the most effective erosion preventive available.

Specifications

Selection of Plant Materials

1. Selection of plant materials is based on climate, topography, soils, land use, and planting season. To determine which plant materials are best adapted to a specific site, use Tables 1.66b and 1.66c, which describe plant characteristics and list recommended varieties.

2. Appropriate seeding mixtures for various site conditions in Florida are given in Table 1.66a. These mixtures are designed for general use, and are known to perform well on the sites described. Adhere to these mixtures whenever feasible. Check Tables 1.66b and 1.66c for recommended varieties.

Seedbed Requirements

Vegetation should not be established on slopes that are unsuitable due to inappropriate soil texture, poor internal structure or internal drainage, volume of overland flow, or excessive steepness, until measures have been taken to correct these problems.

To maintain a good stand of vegetation, the soil must meet certain minimum requirements as a growth medium. The existing soil must have these criteria:

1. Enough fine-grained material to maintain adequate moisture and nutrient supply.

2. Sufficient pore space to permit root penetration. A bulk density of 1.2 to 1.5 indicates that sufficient pore space is present. A fine granular or crumb-like structure is also favorable.

3. Sufficient depth of soil to provide an adequate root zone. The depth to rock or impermeable layers such as hardpans shall be 12 inches or more, except on slopes steeper than 2:1 where the addition of soil is not feasible.

R0071510

4. A favorable pH range for plant growth. If the soil is so acid that a pH range of 6.0-7.0 cannot be attained by addition of pH-modifying materials, then the soil is considered an unsuitable environment for plant roots.

5. Freedom from toxic amounts of materials harmful to plant growth.

6. Freedom from excessive quantities of roots, branches, large stones, large clods of earth, or trash of any kind. Clods and stones may be left on slopes steeper than 3:1 if they are to be hydroseeded.

If any of the above criteria cannot be met, i.e., if the existing soil is too coarse, dense, shallow, acid, or contaminated to foster vegetation, then topsoil should be applied in accordance with TOPSOILING, ES BMP 1.61.

Necessary mechanical erosion and sediment control practices will be installed prior to seeding. Grading will be carried out according to the approved plan.

Surfaces will be roughened in accordance with SURFACE ROUGHENING, ES BMP 1.60.

Soil Conditioners

In order to modify the texture, structure, or drainage characteristics of a soil, the following materials may be added to the soil:

1. Peat shall be sphagnum moss peat, hypnum moss peat, reed-sedge peat or peat humus, from fresh-water sources. Peat shall be shredded and conditioned in storage piles for at least six months after excavation.

2. Sand shall be clean and free of toxic materials.

3. Vermiculite shall be horizontal grade and free of toxic substances.

4. Rotted manure shall be stable or cattle manure not containing undue amounts of straw or other bedding materials or toxic chemicals.

5. Thoroughly rotted sawdust shall be 6 lbs. of nitrogen added to each cubic yard and shall be free of stones, sticks, and toxic substances.

6. Where local ordinances permit, treated sewage sludge may be used in accordance with local, state, and federal regulations.

Lime and Fertilizer

Lime and fertilizer needs should be determined by soil tests. Soil tests may be performed by the Cooperative Extension Service Soil Testing Laboratory at the U.F., or by a reputable commercial laboratory. Information concerning the State Soil Testing Laboratory is available from county extension agents.

R0071511

Under unusual conditions where it is not possible to obtain a soil test, the following soil amendments will be applied:

LIME: 2 tons/acre finely ground agricultural or dolomitic limestone (90 lbs./1000 $ft.^2$).

FERTILIZER: Mixed grasses and legumes: 1000 lbs./acre 5-20-10 (25 lbs./1000 $ft.^2$).

Legume stands only: 1000 lbs./acre 5-20-10 (25 lbs./1000 $ft.^2$).

Grass stands only: 1000 lbs./acre 5-20-10 and 300 lbs. of 38-0-0 in spring (7 lbs./1000 $ft.^2$).

1000 lbs./acre 10-20-10 and 300 lbs. of 38-0-0 in fall (7 lbs./1000 $ft.^2$).

Other fertilizer formulations may be used, provided they can supply the same amounts and proportions of plant nutrients.

Incorporation - Lime and fertilizer shall be incorporated into the top 4-6 inches of the soil by discing or other means. When applying lime and fertilizer with a hydroseeder, apply to a rough, loose surface.

Seeding

1. Certified seed should be used for all permanent seeding whenever possible.

2. Legume seed - Legume seed should be inoculated with the inoculant appropriate to the species. Seed of lespendezas, crown vetch, and clovers should be scarified to promote uniform germination.

3. Apply seed uniformly with a cyclone seeder, drill, cultipacker seeder, or hydroseeder on a firm, friable seedbed. Maximum seeding depth should be 1/4 inch.

4. Hydroseeding - To avoid seed damage, it is recommended that if a machinery breakdown of 30 minutes to 2 hours occurs, 50% more seed be added to the tank, based on the proportion of the slurry remaining in the tank. Beyond 2 hours, a full rate of new seed may be necessary.

   Often hydroseeding contractors prefer not to apply lime in their rigs as it is abrasive. In inaccessible areas, lime may have to be applied in pelletized or liquid form, separately. Rates of wood fiber should be at least 2000 lbs. per acre. Surface roughening is particularly important when hydroseeding, as a roughened slope will provide some natural coverage of lime, fertilier and seed.

5. Legume inoculants should be used by the date indicated on the container. When dry seeding use four times the manufacturer's recommended rate and use ten times the recommended rate of inoculant when hydroseeding.

R0071512

Mulching

All permanent seeding must be mulched immediately upon completion of seed application. Refer to MULCHING, ES BMP 1.75.

Maintenance of New Seedings

Irrigation: New seedings should be supplied with adequate moisture. Supply water as needed, especially late in the season, in abnormally hot or dry weather, or on adverse sites. Water application rates should be controlled to prevent runoff. Inadequate amounts of water may be more harmful than no water.

Re-seeding: Inspect seeded areas for failure and make necessary repairs and reseedings within the same season, if possible.

1. If vegetative cover is inadequate to prevent rill erosion, overseed and fertilize in accordance with soil test results.

2. If a stand has less than 40% cover, re-evaluate choice of plant materials and quantities of lime and fertilizer. Re-establish the stand following seedbed preparation and seeding recommendations, omitting lime and fertilizer in the absence of soil test results. NOTE: if vegetation has failed to grow, soil must be tested to determine if acidity or nutrient imbalances are responsible.

Fertilization: Seedlings should be fertilized one year after planting to insure proper stand density.

1. To established all-grass stands, apply 500 lbs./acre of 10-20-10 (12 lbs./1000 $ft.^2$) between August 15 and November 15. (The first fall following seeding.)

2. To legume-and-grass stands or pure legume stands, apply 500 lbs./acre of 0-20-20 (12 lbs./1000 $ft.^2$) in early May or between August 15-October 15.

GENERALLY, A STAND OF VEGETATION CANNOT BE DETERMINED TO BE FULLY ESTABLISHED UNTIL SOIL COVER HAS BEEN MAINTAINED FOR ONE FULL YEAR FROM PLANTING. DISTURBED AREAS WHICH ARE TO BE STABILIZED WITH PERMANENT VEGETATION MUST BE SEEDED OR PLANTED WITHIN 15 DAYS AFTER FINAL GRADE IS REACHED UNLESS TEMPORARY STABILIZATION IS APPLIED.

R0071513

TABLE 1.66 A

SEEDING MIXTURES, RATES AND DATES

Site Conditions	Seeding Mixtures	Seeding Rate		Seeding Dates			Comments
		Per Acre	Per 1000 Ft^2	North	Central	South	
High Maintenance Lawns	See Table 1.67A						
General Use	1. Bahiagrass	40-60 lbs	1 lb	2/15-8/15	2/1-8/31	1/15-9/15	Use 50% scarified seed.
	2. Bahiagrass	40-60 lbs	1 lb	2/15-8/15	2/1-8/31	1/15-9/15	Use 50% scarified Bahia seed.
	Bermudagrass (Hulled)	8-12 lbs	4 oz				
	3. Bahiagrass with one of the following:	20-30 lbs	.5 lb				Use 50% scarified Bahia seed.
	Southern White Clover	3 lbs	1.2 oz	9/1-1/1	9/15-1/1	10/1 -12/15	Innoculate legumes.
	Annual White Sweetclover	8 lbs	3 oz	9/1-1/1	9/15-1/1	10/1-12/15	
	Crimson Clover	12 lbs	4.5 oz	9/1-1/1	9/15-1/1	10/1-12/15	
	Arrowleaf Clover	8 lbs	3 oz	9/1-1/1	9/15-1/1	10/1-12/15	
	Alyce Clover	8 lbs	3 oz	2/15-7/15	2/1-7/15	1/15-7/15	
	Hairy Indigo	4 lbs	1.5 oz	2/15-7/15	2/1-7/15	1/15-7/15	
	Aeschynomene	12 lbs	4.5 oz	2/15-7/15	2/1-7/15	1/15-7/15	
Slopes	1. Sericea lespedeza	a.40-50 lbs	1.2 lbs	1/1-7/15	1/15-7/15	1/15-7/1	For scarified seed.
		b. 75 lbs	1.7 lbs	7/15-1/1	7/15-1/15	7/1-1/15	For unhulled seed.
	2. Sericea lespedeza with one of the following:						Use seeding rate specified above.
	Bahiagrass	15 lbs	7 oz	2/15-8/15	2/1-8/31	1/15-9/15	
	Tall Fescue	20 lbs	8 oz	10/1-11/15	10/15-11/30		Best adapted to N. Florida.
	Weeping Lovegrass	3 lbs	1.2 oz	2/15-8/15	2/1-8/31	1/15-9/15	
Droughty Areas	1. Weeping lovegrass	5 lbs	2 oz	2/15-8/15	2/1-8/31	1/15-9/15	Gives quick summer cover.
	2. Weeping lovegrass with one of the following:	5 lbs	2 oz	2/15-8/15	2/1-8/31	1/15-9/15	
	a. Bahiagrass (50% scarified seed)	30-40 lbs	12 oz	2/15-8/15	2/1-8/31	1/15-9/15	
	b. Bermudagrass (Hulled)	8-12 lbs	4 oz	2/15-8/15	2/1-8/31	1/15-9/15	
	c. Hairy panicum	8-12 lbs	4 oz	2/15-8/15	2/1-8/31	1/15-9/15	
	d. Sericea lespedeza						Use seeding rate and dates specified above.

R0071514

TABLE 1.66 B

CHARACTERISTICS OF GRASSES APPROPRIATE FOR EROSION CONTROL

Common Name (Botanical Name)	Life Cycle	Season	Sod-Former	Bunch Grass	Prop Method (2)	Salt Tolerance	Drainage Tolerance						Maintenance Requirements	Comments	Suggested Varieties for Florida
							D	WD	MWD	SPD	PD	FT			
BAHIAGRASS (Paspalum notatum)	P	W	X		S Sd	L	X	X	X	X	X		Low. Requires good, moisture for germination, first growth.	Use scarified seed. Widely used on highways for stabilizing shoulders.	Pensacola Argentine Paraguay 22
BERMUDAGRASS (Cynodon sp)	P	W	X		S Sd Sp	H		X	X	X			High. Requires fertilization.	Common can be seeded. Coastal does not do well on poorly drained flatwood soils. Callie tolerates very droughty soils.	Common Callie Coastal
BUSHYBEARD BLUESTEM (Andropogon glomeratus)	P	W		X	S T	L		X	X				Very low. Does well on soils of low fertility.	Good cover for old fields or vacant lots. Native grass.	
CARPETGRASS (Axonopus affinis)	P	W	X		S Sp	L				X	X	X	Low. Responds little to fertilization.	Poor cold hardiness and drought tolerance.	
COMMON REEDGRASS (Phragmites communis)	P	W		X	R T	M				X	X	X	Low. Requires water.	Grows in marshes, swamps, on banks of streams of streams and lakes. Excellent erosion control plant in such areas.	
CREEPING BLUESTEM (Andropogon stolonifer)	P	W		X	R T	M		X	X	X	X		Low.	Grows best in open spaces, tolerates some shade Excellent cover for vacant lots.	
EASTERN GAMAGRASS (Tripsacum dactyloides)	P	W		X	R T	L				X	X	X	Low. Very robust growth.	Flood tolerant for short periods only. Excellent erosion control along streams and lakes.	
GIANT REEDGRASS (Arundo donax)	P	W		X	R T	L				X	X	X	Low.	Excellent erosion control plant along streams and lakes. Good screening plant.	
HAIRY PANICUM (Panicum rhizomatum)	P	W		X	R S	L	X	X					Low.	Good cover on dry sandy soils. Good wildlife plant food.	
LIMPO GRASS (Hemarthria altissima	P	W		X	Sp T	L				X	X	X	Low. Grows well with moderate fertilization	Continuous growth during cool season. Some varieties do well under freezing temperatures.	
LONGLEAF UNIOLA (Uniola sessiliflora)	P	C		X	S	L				X	X	X	Low. Grows on soils of low fertility.	Good cover plant for shaded areas. Not suited to wet soils or sand hills.	
LOPSIDED INDIANGRASS (Sorghastrum secundum	P	W		X	S	L	X	X	X				Low.	In S. Florida, growth starts by mid-January. In N. Florida, growth starts by April.	

R0071515

TABLE 1.66 B (Continued)

CHARACTERISTICS OF GRASSES APPROPRIATE FOR EROSION CONTROL

Common Name (Botanical Name)	Life Cycle	Season	Sod-Former	Bunch Grass	Prop Method	Salt Tolerance	Drainage Tolerance (1)						Maintenance Requirements	Comments	Suggested Varieties for Florida
							D	WD	MWD	SPD	PD	PT			
MAIDENCANE (Panicum hemitomon)	P	W		X	RT	L				X	X	X	Low.	Grows best if water level fluctuates from two (2) inches above soil to four (4) inches below. Erosion control plant for marshes, swamps, stream banks.	
MARSHHAY CORDGRASS (Spartina patens)	P	W		X	ST	H		X	X	X	X	X	Low.	Good for sand dune stabilization as well as coastal marshes.	
PANGOLAGRASS (Digitaria decumbens)	P	W	X		SSp	L				X	X	X	Moderate. Plant with legumes to provide nitrogen.	Use in S. Florida only.	
SEA OATS (Uniola paniculata)	P	W		X	ST	H	X	X	X				Low. Once established thrive with little help.	Excellent for sand dune stabilization. Protected by Florida laws.	
SEASHORE SALTGRASS (Distichlis spicata)	P	W		X	RT	H				X	X	X	Low.	Does best if water level fluctuates between two (2) two inches above soil surface to six (6) inches below.	
SHOREDUNE PANICUM (Panicum amarulum)	P	W		X	ST	H	X	X	X				Low.	Native to coastal dunes. Excellent for stabilizing dunes.	
SHOREGRASS (Monanthochloe littoralis)	P	W			T	H					X	X	Low.	Good ground cover on tidal flats and extremely salty areas.	
SMOOTH CORDGRASS (Spartina alterniflora)	P	W		X	ST	H				X	X	X		Native to salt marshes and tidal flats. Seedheads produced in October-November.	
SWITCHGRASS (Panicum virgatum)	P	W		X	ST	H				X	X	X	Low.	Excellent for streambank, marsh stabilization.	
TALL FESCUE (Festuca pratensis)	P	C	X		S	L		X	X	X			Moderate. Needs nitrogen supplements.	Use in N. and N.W. Florida only.	
WEEPING LOVEGRASS (Eragrostis curvula)	P	W				L	X	X	X	X			Mow yearly to encourage persistence.	Tolerates acid, infertile soils and steep, droughty slopes.	
ANNUAL RYEGRASS (Lolium multiflorum)	A	C		X	S	L		X	X	X	X	X		Cool season companion grass. Use as temporary cover when permanent cover is being established in fall, winter.	

R0071516

TABLE 1.66 B (Continued)

CHARACTERISTICS OF GRASSES APPROPRIATE FOR EROSION CONTROL

Common Name (Botanical Name)	Life Cycle	Season	Sod-Former	Bunch Grass	Propagation Method (2)	Salt Tolerance	Drainage Tolerance (1)						Maintenance Requirements	Comments	Suggested Varieties for Florida
							D	WD	MWD	SPD	PD	FT			
RYE (Secale cereale)	A	C		X	S	L	X	X	X	X				Use in a similar manner to annual ryegrass.	
OATS (Avena sativa)	A	C		X	S	L		X	X					Use in a similar manner to annual ryegrass and rye.	

(1) D = Droughty
WD= Well-drained
MWD=Moderately Well-drained
SPD=Somewhat poorly drained
PD= Poorly drained
P = Perennial
A = Annual
sP= Short-lived perennial
W = Warm season plant, grows in summer
C = Cool season plant, grows in fall, winter, spring

(2) Propagation Methods
S = Seed
Sd = Sod
Sp = Sprig
R = Rhizomes
T = Transplant

R0071517

TABLE 1.66 C

CHARACTERISTICS OF LEGUMES APPROPRIATE FOR EROSION CONTROL

Common Name (Botanical Name)	Life Cycle	Season	Germ Time Days	Drainage Tolerance					Remarks	Suggested Varieties for Florida
				D	WD	MWD	SPD	PD		
ALYCECLOVER (Alysicarpus vaginalis)	A	W	7-21		X	X				
ARROWLEAF CLOVER (Trifolium vesiculosum)	A	C	7-21		X	X	X		Well adapted to well-drained loamy sands and clays in N. Florida. Does not germinate well at high temperatures or dry conditions. If planted with permanent grassess, do not use Meechee variety. Reseeds itself.	AMCLO YUCHI MEECHEE
CRIMSON CLOVER (Trifolium incarnatum)	A	C	7-21		X	X			Does poorly on deep dry sands, will not tolerate flooding. Adapted to N. Florida. Widely used in N. Florida along highways. Do not mow before seed heads mature if it is to serve as a perennial.	DIXIE AUTAUGA AUBURN
RED CLOVER (Trifolium pratense)	A	C	7-21		X	X	X		Has soil requirements similar to white clover but is more easily damaged by excess water. Does not seed abundantly in Florida. Useful with tall fescue in low maintenance stands.	TENSAS NOLIN'S
SWEET CLOVER (Melilotus altissima	A	C	7-21			X	X		Productive on both flatwoods (which do not flood) and upland soils. Produces seed but needs to be reseeded to maintain stand.	HUBAM FLORANNA ISRAEL
WHITE CLOVER (Trifolium repens)	A	C	7-21				X	X	Best cool season legume for flatwoods and other high moisture fertile soils. Requires continuous and abundant moisture, tolerates short-term flooding.	LOUISIANA S-1 NOLIN'S - IMPROVED
LUPINE (Lupinus sp.)	A	C	7-21		X	X			Very susceptible to freeze damage at time of emergence. An excellent cover plant.	SWEETBLUE FROST RANCHER
AUSTRIAN WINTER PEAS	A	C	7-21		X	X				COMMON ROMAIC DIXIE WONDER
ALFALFA (Medicago sativa)	sP	W	10-21	X	X				Develop deep root system which makes it drought-tolerant. Will not tolerate flooding Plant in early fall to insure establishment before first frost. Requires good, fertile soil and has relatively high maintenance needs.	FLORIDA 77
HAIRY INDIGO (Indigofera hirsuta)	A	W	7-21		X	X			Sensitive to cold, killed by first frost. To assure reseeding, mow after seed matures in fall before first frost.	EARLY LATE
CROWN VETCH (Coronilla varia)	sP	C	14-21	X	X	X			Needs high lime or calcareous soil, high phosphorus. Does not tolerate wet soil. Useful on steep slopes and rocky areas.	
JOINT VETCH (Aeschynomene americana)	A	W	7-21				X	X	Widely used in Central and South Florida especially in low, wet areas.	
ANNUAL LESPEDEZA (Lespedeza striata)	A	W	14-21	X	X	X			Fairly drought resistant. Use with cool season companion plant for year-round soil protection. Grows in thick stands.	KOBE COMMON

R0071518

TABLE 1.66 C (Continued)

CHARACTERISTICS OF LEGUMES APPROPRIATE FOR EROSION CONTROL

Common Name (Botanical Name)	Life Cycle	Season	Germ Time Days	Drainage Tolerance[1]					Remarks	Suggested Varieties for Florida
				D	WD	MWD	SPD	PD		
SERICEA LESPEDEZA (Lespedeza cuneata)	P	W		X	X	X			Deep rooted and drought tolerant. Very useful on infertile slopes. Will tolerate short term flooding, particularly in winter. If used alone, use scarified seed (50 lbs/acre) from Dec. to July; unhulled seed (75 lbs/acre) other times.	INTERSTATE SERALA
PERENNIAL PEANUT (Arachis glabrata)	P	W		X	X	X			Not adapted to flatwoods soils or high-water table soils. Drought resistance once established. Establish by planting rhizomes.	FLORIGRAZE
SESBANIA (Sesban macrocarpa)	A	W	7-21				X	X	Tolerates extremely wet conditions.	

1 D = Droughty
WD= Well-Drained
MWD=Moderately Well-Drained
SPD=Somewhat Poorly Drained
PD= Poorly Drained
P = Perennial
A = Annual
SP= Short-lived Perennial
W = Warm season plant, grows in summer
C = Cool season plant, grows in fall, winter, spring

NOTE: Seed of all legumes must be innoculated with the correct strain of bacteria.

R0071519

ES BMP 1.67

SODDING

Definition

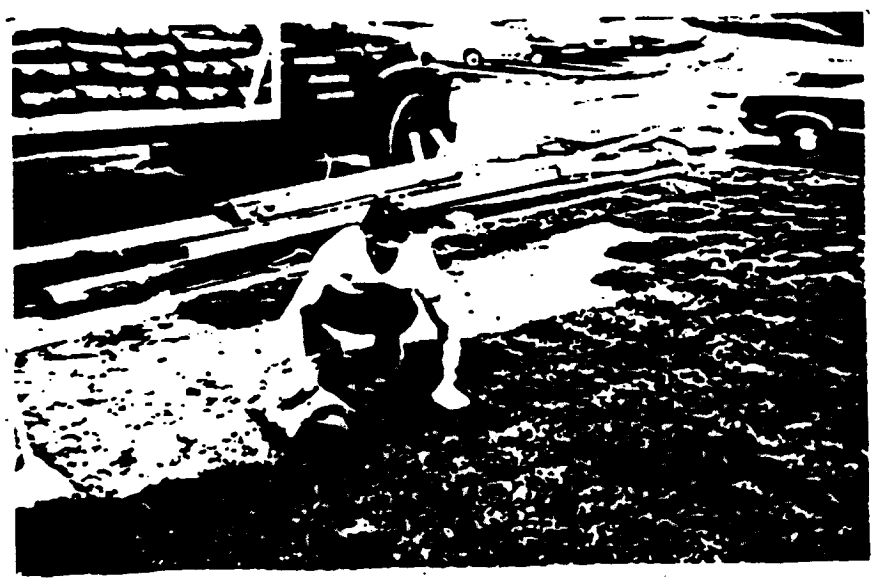
Stabilizing fine-graded disturbed areas by establishing permanent grass stands with sod.

Purposes

1. To establish permanent turf immediately.
2. To prevent erosion and damage from sediment and runoff by stabilizing the soil surface.
3. To reduce the production of dust and mud associated with bare soil surfaces.
4. To stabilize drainageways where concentrated overland flow will occur.

Conditions Where Practice Applies

1. Disturbed areas which require immediate vegetative covers, or where sodding is preferred to other means of grass establishment.



R0071520

2. Locations particularly suited to stabilization with sod are:
   --waterways carrying intermittant flow
   --area around drop inlets in grassed swales
   --residential or commercial lawns where quick use or aesthetics are factors.

Planning Specifications

The successful establishment of quality turfgrass is relatively easy in Florida. Sod is relatively inexpensive and fairly easy to obtain throughout the state.

A quality turf containing the recommended mixtures and species can be established with either seed or sod. Soil preparation for the two methods is the same.

The advantages of properly installed sod include:

1. immediate erosion control
2. an instant green surface with no dust or mud
3. nearly year-round establishment capability
4. less chance of failure than with seed
5. freedom from weeds
6. quick use of the sodded surface
7. the option of buying a quality-controlled product with predictable results.

It is initially more costly to install sod than to seed. However, this cost is justified in places where sod can perform better than seed in controlling erosion.

In swales and waterways where concentrated flow will occur, properly pegged sod is preferable to seed because there is no lag time between installation and the time when the channel is protected by vegetation.

Drop inlets which will be placed in grassed areas can be kept free of mulch, seed, and mud, and the grade immediately around the inlet can be maintained, by framing the inlet with sod strings.

Sod can be laid during any time of the year so long as there is adequate water available to meet the moisture requirements of the grass.

Ground preparation and proper maintenance are as important with sod as with seed. Sod is composed of living plants and those plants must receive adequate care in order to provide vegetative stabilization on a disturbed area. Sod cannot be expected to provide erosion control and prevent soil slippage on a slope that is not stable because of its structure, water movement or excessive gradient.

R0071521

Specifications

Soil Preparation

1. Prior to soil preparation, areas to be sodded shall be brought to final grade in accordance with the approval plan. These operations should leave as much topsoil as possible or replace the topsoil to a depth of four inches.

2. Soil tests should be made to determine the exact requirements for lime and fertilizer. Soil tests may be conducted by the State Laboratory at the University of Florida or a reputable commercial laboratory. Information on state soil tests is available from county agricultural extension agents.

   When a soil test is not made the following soil amendments should be made:

   Pulverized agricultural limestone at 100 lbs./1000 ft.^{2} (2 tons/acre).

   Fertilizer at 25 lbs./1000 ft.^{2} (1000 lbs./acre) of 10-10-10 in fall or 25 lbs./1000 ft.^{2} of 5-10-10 in spring. NOTE: Equivalent nutrients may be applied with other fertilizer formulations.

   These amendments shall be spread evenly over the area to be sodded, and incorporated into the top 3-6 inches of the soil by discing, harrowing or other acceptable means.

3. Prior to laying sod, the soil surface shall be clear of trash, debris, roots, branches, stones and clods in excess of 2 inches in length or diameter. Sod shall not be applied to gravel or other non-soil surfaces.

4. Any irregularities in the soil surface resulting from topsoil or other operations shall be filled or leveled in order to prevent the formation of depressions or water pockets.

5. Areas to be topsoiled and topsoil used shall fulfill the requirements of TOPSOILING, ES BMP 1.61. No sod shall be spread on soil which has been treated with soil sterilants until enough time has elapsed to permit dissipation of toxic materials.

Sod Quality

1. Sod should be free of weeds and undesirable coarse weedy grasses. If possible, Certified or Approved turfgrass sod should be used.

2. Sod shall be machine cut at a uniform soil thickness of 3/4 inch, plus or minus 1/4 inch, at the time of cutting. This thickness shall exclude shoot growth and thatch.

3. Pieces of sod shall be cut to the supplier's standard width and length, with a maximum allowable deviation in any dimension of 5%. Torn or uneven pads will not be acceptable.

4. Standard size sections of sod shall be strong enough to support their own weight and retain their size and shape when suspended from a firm grasp on one end of the section.

5. Sod shall be not cut or laid in excessively wet or dry weather.

6. Sod shall be harvested, delivered, and installed within a period of 36 hours.

Choosing Appropriate Types of Sod

The type of sod used must be composed of plants adapted to the locality. Use Table 1.67a to select the type of sod best suited to your area.

Sod Installation

A. Solid Sodding (Plate 1.67a)

1. Irrigate areas to be sodded with a minimum of 1/2-inch of water unless recent rains have provided equivalent moisture.

2. The first row of sod shall be laid in a straight line with subsequent rows placed parallel to and butting tightly against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Care shall be exercised to insure that sod is not stretched or overlapped and that all joints are butted tight in order to prevent voids which would cause drying of the roots.

3. On slopes 3:1 or greater, or wherever erosion may be a problem, sod shall be laid with staggered joints and secured by pegging or other approved methods. Sod shall be installed with the length perpendicular to the slope (on the contour). Begin laying sod at the bottom of the slope and work uphill. On very steep slopes, the use of ladders will facilitate the work and prevent damage to the sod.

4. Surface water cannot always be diverted from flowing over the face of the slope, but a capping strip of heavy jute or erosion netting, properly secured, along the crown of the slope will provide extra protection against lifting and undercutting of sod. This same technique can be used to fortify sod in water-carrying channels and other critical areas. Use wire staples to anchor heavy jute or erosion netting in channels.

5. As sodding of clearly defined areas is completed, sod shall be rolled or tamped to provide firm contact between roots and soil.

6. After rolling, sod shall be irrigated to a depth sufficient that the underside of the sod pad and the soil 4 inches below the sod is thoroughly wet.

7. During the first week, in the absence of adequate rainfall, watering shall be performed as often as necessary to maintain moist soil to a depth of at least 4 inches.

R0071523

8. The first mowing shall not be attempted until the sod is firmly rooted, usually after 2-3 weeks. Not more than 1/3 of the grass leaf should be removed at any one cutting.

B. **Spot Sodding**

1. Spot sodding is the planting of plugs or blocks, a minimum of four inches in diameter or square, of sod at measured intervals. The plugs or blocks should be placed one foot apart.

2. Sod spots within a row should be placed alternately and not directly opposite sod spots in adjacent rows.

3. Fit the plugs or blocks tightly into prepared holes and tamp them firmly into place.

4. Irrigate to a depth sufficient that the underside of the sod spot and the soil 4 inches below the sod is thoroughly wet.

C. **Strip Sodding**

1. Areas to be strip sodded should be fertilized, limed, prepared and smoothed as in solid sodding.

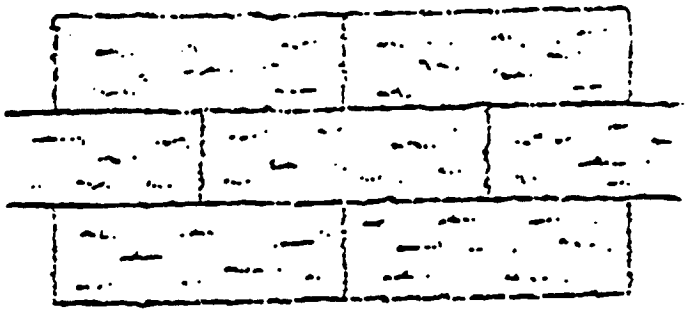
2. Lay the strips end to end in rows that are from 1 to 1-1/2 feet apart with the stripe a minimum of 2 to 4 inches wide.

3. Roll or tamp the strips thoroughly to provide firm contact between roots and soil.

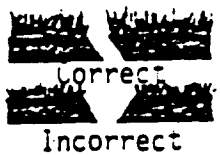
4. Irrigate to a depth sufficient that the underside of the strips and the soil 4 inches below the strips are wet.

R0071524

SODDING



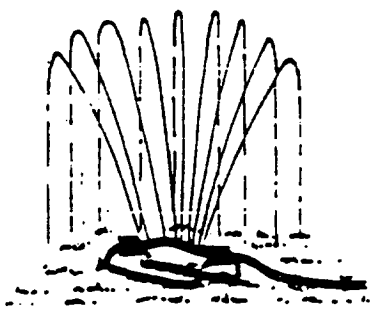
Lay sod in a staggered pattern. Butt the strips tightly against each other. Do not leave spaces and do not overlap. A sharpened mason's trowel is a handy tool for tucking down the ends and trimming pieces.



Butting - angled ends caused by the automatic sod cutter must be matched correctly.



ROLL sod immediately to achieve firm contact with the soil.

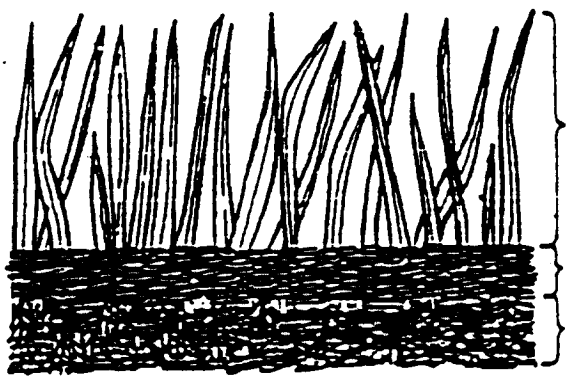


WATER to a depth of 4" as needed. Water well as soon as the sod is laid.



MOW when the sod is established - in 2-3 weeks. Set the mower high (2"-3").

APPEARANCE OF GOOD SOD



Shoots or grass blades. Grass should be green and healthy, mowed at a 2"-3" cutting height.

Thatch - grass clippings and dead leaves, up to 1/2" thick.

Root Zone - soil and roots. Should be 1/2"-3/4" thick, with dense root mat for strength.

Source: Va SWCC

Plate 1.67a

R0071525

Sodded Waterways (Plate 1.67b)

1. Care should be taken to prepare the soil adequately in accordance with this specification. The sod type shall consist of plant materials able to withstand tne designed velocity. (See STORMWATER CONVEYANCE CHANNELS, ES BMP 1.35).

2. Sod strips in waterways shall be laid perpendicular to the direction of flow. Care should be taken to butt ends of strips tightly.

3. After rolling or tamping, sod shall be pegged or stapled to resist washout during the establishment period. Chicken wire, jute or other netting may be pegged over the sod for extra protection in critical areas.

4. All other specifications for this practice shall be adhered to when sodding a waterway.

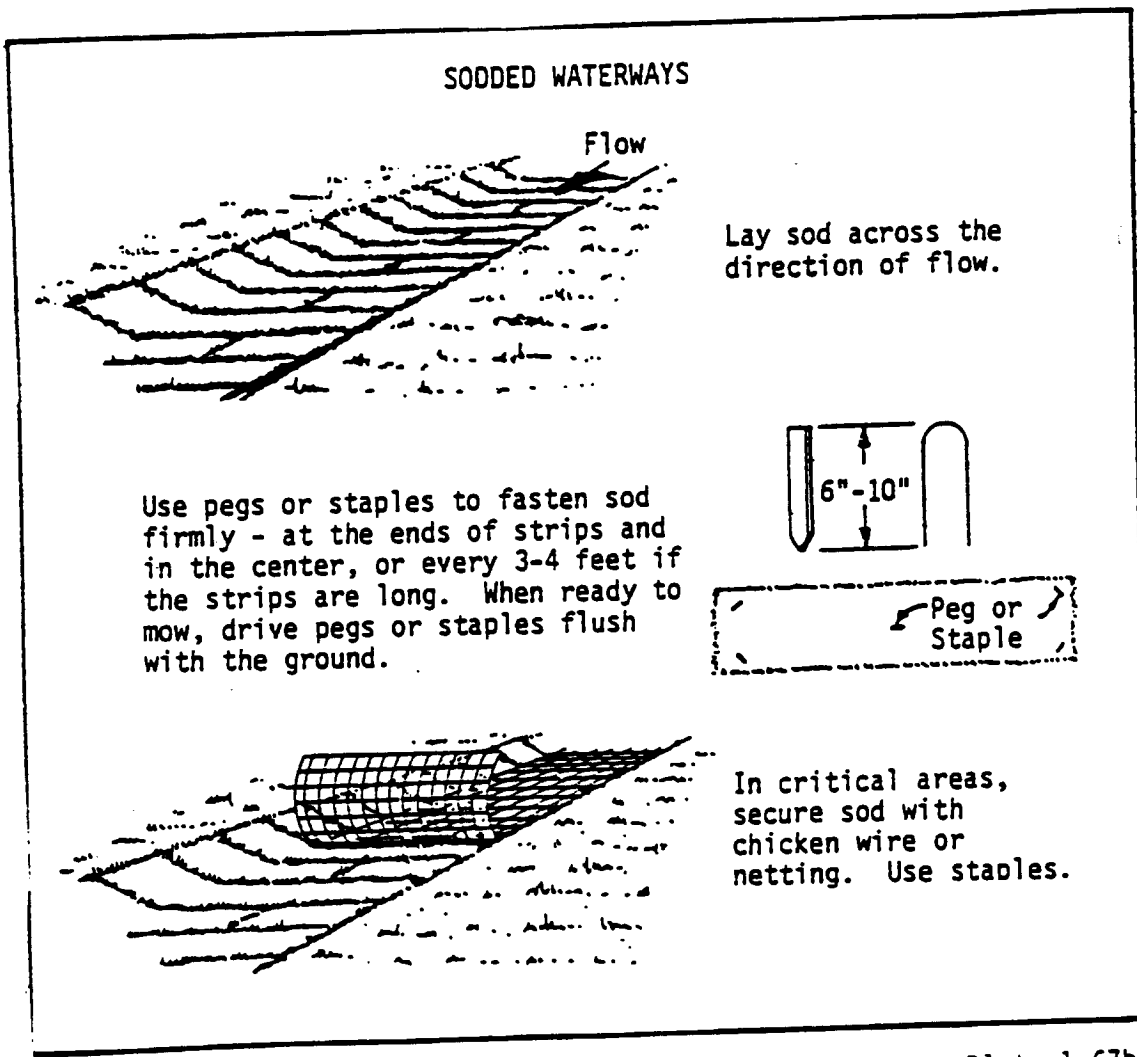


Plate 1.67b

R0071526

Maintenance of Established Sod

1. After the first week, sod shall be watered as necessary to maintain adequate moisture in the root zone and prevent dormancy.

2. Apply lime and fertilizer under a regular program based on soil tests and on the use and general appearance of the vegetative cover. In the absence of a soil test apply 1-2 tons/acre (45-90 lbs./1000 $ft.^2$) of finely ground agricultural limestone every three years. Apply 400-500 lbs./acre (9-18 lbs./1000 $ft.^2$) of 10-10-10 fertilizer. To obtain better vegetative cover, topdress with 150-300 lbs./acre (6-12 lbs./1000 $ft.^2$) of 16-4-4 fertilizer during the growing season, but at least six weeks before the end of the growing season.

   If Centipede or St. Augustine grass is used, do not apply more than 1 pound of actual nitrogen per 1000 $ft.^2$ (20-40 lbs./acre).

3. Mow to control weeds, improve the appearance of the vegetative cover, and to reduce fire hazard, as necessary. In general, the coarser the leaf texture of the grass, the higher it should be cut. Continuous close mowing will result in loss of vigor and reduced stand. No more than 1/3 of the grass leaf should be removed in any mowing.

R0071527

TABLE 1.67a

Comparison of Florida Lawn Grasses

Grass	Texture	Soil Adaptability	Tolerances*			Minimum Fertilization/yr.
			Shade	Salt	Drought	
A. HIGH MAINTENANCE						
St. Augustine	Coarse	Wide Range	E	E	G	1-4
Bermuda	Fine	Wide Range	VP	F-G	F	4-6
Zoysia	Intermediate to Fine	Wide Range	G	G	F	2-4
B. LOW MAINTENANCE						
Bahia	Intermediate to Coarse	Acid Soils	E	P-F	E	1-2
Centipede	Intermediate	Acid Soils	G	VP	F-G	1
Carpet	Intermediate	Wet, Acid Soils	F-G	VP	P	1

*Tolerances:

E = Excellent
G = Good
F = Fair
P = Poor
VP = Very Poor

R0071528

ES BMP 1.68

BERMUDAGRASS ESTABLISHMENT

Definition

The establishment of vegetative cover with hybrid bermudagrass by planting sprigs, stolons, or plugs.

Purposes

1. To reduce erosion and decrease sediment yield from disturbed areas.
2. To stabilize disturbed areas with a specific plant material suited to the site which cannot be established by seed.
3. To establish vegetative cover more rapidly than would be possible using seed.

Conditions Where Practice Applies

1. In areas where hybrid bermudagrass is the desired plant material, and establishment with sod is not preferred.
2. Bermudagrass is particularly suited to droughty, sandy sites or situations where high salt content is a problem. It should not be used in shaded areas or on poorly drained sites.
3. Irrigation must be available during the establishment phase.



R0071529

Planning Considerations

Bermudagrasses are warm-season permanent grasses which are well suited to erosion control, as they have vigorous rhizomes and stolons (runners). There are two main types of bermudagrass in Florida, common and hybrid. Common bermudagrass produces seed and may be established with seeds. However, it has the potential to become a weed problem because it spreads vigorously; it is also coarse and not suitable for fine turf. Common bermuda has little cold tolerance and winterkills frequently.

Hybrid bermudagrasses do not produce seed and must be established by sodding, sprigging or plugging. These grasses produce a fine, tight turf, do not spread as virorously as common bermudagrass, exhibit good cold tolerance, and can withstand many adverse conditions. For these reasons, hybrid bermudagrass produces the finest lawns in Florida, however they require extensive maintenance.

Turf may be established most rapidly and efficiently with sod. Where speed is essential and cost is not an overriding constraint, sod should be used. (See SODDING, ES BMP 1.67).

> Sprigging: A bermudagrass sprig is a small section of rhizome (underground stem) 3 to 5 inches long, with at least one node or joint. Leaves should be present at the nodes. Stolons (runners) are above-ground stems that spread by creeping on the soil surface. A mixture of sprigs and stolons is usually used in "sprigging". Sprigs may be planted by machine or by hand.
>
> Plugging: Plugs are small sections of sod which are expressed into precut holes in the soil so that topgrowth is flush to the surface and leaves are exposed. Plugs are usually planted by hand.

Bermudagrass is particularly suited to use in grassland waterways. Depending upon the soil type, an established stand of bermudagrass can tolerate intermittent concentrated flows of water on slopes up to 10%. It is important to divert runoff from the waterway during the first three weeks of establishment to permit bermudagrass to take root. If this cannot be done, the center of the waterway should be sodded to prevent washout.

Bermudagrass is drought-tolerant, salt-tolerant, and tolerates floods of short duration. It prefers a pH range from 6.0-7.0 with high nitrogen fertilization during the growing season. In northern and parts of central Florida, bermudagrass will be dormant in winter and will turn brown at that time.

The Bermudagrass hybrids most frequently used in Florida differ in appearance, texture, growth rate, susceptibility to pests and suitability for turf use. The following varieties are suggested for rough and fine-turf areas:

For Rough Areas

Common: A low growing variety that produces dense sod. It is very coarse and typically used for forage or erosion control in critical areas.

Coastal: Also a forage type used in low maintenance areas.

For Fine-turf Areas

Ormond: A medium-textured, dense type with good drought and cold tolerance. Very susceptible to dollar spot disease and the stunt mite.

Tiflawn: Also called Tifton-57. Similar to Ormond but less susceptible to dollar spot and mites.

Tifway: Also called Tifton-419. Often used on golf course fairways.

Tifgreen and Tifdwarf: Both are used on golf greens. Very fine textured, textured, dense sod but requires very high maintenance.

Specifications

Soil Preparation

Procedures for preparing the soil are the same for sprigging and plugging.

1. Bermudagrass requires soil which is well drained, loose enough for root penetration, has a pH range between 6.0-7.0, and is free of toxic amounts of materials harmful to plant growth. If any of these criteria cannot be met, topsoil shall be applied in accordance with TOPSOILING, ES BMP 1.61.

2. Necessary erosion and sediment control practices will be installed prior to establishment of bermudagrass. Final grading will be carried out according to the approved plan.

3. Surfaces will be roughened in accordance with SURFACE ROUGHENING, ES BMP 1.60.

4. The soil shall be free of debris, trash, roots, and weeds.

Lime and Fertilizer

Soil tests should be made to determine the exact requirements for lime and fertilizer. Soil tests may be conducted by the State Laboratory at the University of Florida or at a reputable commercial laboratory. Information on low cost state soil tests is available from county or city agricultural extension agents.

R0071531

Under difficult circumstances where it is not possible to obtain a soil test the following soil amendments shall be made:

Pulverized agricultural limestone: 100 lbs./1000 ft.^{2} (2 tons/acre).
NOTE: Only carbonate forms of lime may be used. Dolomitic limestone shall be used on the Coastal Plain.

Fertilizer: 800 lbs. 10-10-10/acre (20 lbs./1000 ft.^{2}).
NOTE: Equivalent nutrients may be applied with other fertilizer formulations.

These amendments shall be spread evenly over the area to be sprigged, and incorporated into the top 3-6 inches of the soil by discing, harrowing or other acceptable means.

Any irregularities in the soil surface resulting from topsoiling or other operations shall be filled or leveled in order to prevent the formation of water pockets.

SPRIGGING AND PLUGGING

Sources

Sprigs can be purchased as sod and then shredded or can often be purchased by the bushel. For turf-type bermudagrasses, Certified or Approved sod sources (bearing the label of the Florida Crop Improvement Association) should be used. Coastal and Common bermudagrasses are available through agricultural sources. Contact the county or city agricultural extension agent or the Soil Conservation Service district office for information on where these materials may be obtained. Plugs may be cut from sod as needed or purchased pre-cut.

Sprigs shall be 3 to 5 inches long, having several nodes (joints). Plugs shall be a minimum diameter of 2 inches.

Quantities of Materials Needed

Sprigging: 2-7 bushels per 1000 ft.^{2}, or 80-300 bushels per acre. Use of the maximum recommended amount when broadcast sprigging. One bushel of sprigs is approximately equal to 1 yard^2 of sod.

Plugging: About 12 square yards of sod for 1000 ft.^{2}, or 530 square yards of sod per acre.

When to Plant

To establish quickly, bermudagrass should not be in a dormant state (leaves should b egreen) and the material should be fresh and moist. Bermudagrassess may be planted from mid-March until mid-September except in

southern Florida where it can be planted at any time if soil mixture conditions are favorable.

How to Plant

SPRIGGING: Sprigs may be broadcast over the surface by hand, planted in rows by machine, or applied with a hydroseeder. Machines are available which will insert sprigs properly and firm the soil over them. When sprigs are broadcast or hydrosprigged, they should be partially covered with soil by light discing or topdressing with good soil. Ideally, half of the sprig should be covered with soil, and half (including some leaves) should be exposed. Soil should be firmed over the sprigs by using a cultipacker, or by rolling or tamping. Spacing - When planted in row, sprigs should be placed no more than 12 inches apart. Closer spacing is recommended for slopes, waterways, and highly erodible soils.

PLUGGING: Plugs should be inserted in the soil surface so that leaf tips are above the surrounding soil, and tamped firmly in place. Spacing - Plugs should be placed in a grid pattern on 12 inch centers. Close spacing is recommended on critical areas. Plugs are usually placed by hand, but machines are available which can plug automatically.

Weed Control

In order to become effectively established, bermudagrass must not have to compete with weeds or excessive nurse crop growth. These can be controlled by mowing, hand cultivation or the use of herbicides. When herbicides are used, follow current Florida Institute of Food and Agricultural Sciences chemical weed control recommendations and adhere strictly to the instructions on the label.

Maintenance

Bermudagrass sprigs and plugs can be expected to root in 5 to 10 days under optimum conditions. Full coverage of the soil by spreading plants can be effected in 4 to 8 weeks with good growing conditions. The following maintenance activities should be followed to retain effective vegetative cover:

1. Adequate moisture. Water immediately after planting, and water enough to keep soil moist to a depth of 4 inches during the first 4 weeks and as needed thereafter to sustain growth.

2. Sunlight. Do not permit mulches, weeds, or other plantings to shade new bermudagrass stands.

3. Freedom from erosive forces. Keep concentrated flows of water off of new plantings for 2 weeks to one month depending upon growth.

R0071533

4. Repairs. Inspect all areas for planting failures and make necessary repairs, replacements and reseeding within the planting season, if possible.

5. Lime and fertilizer. Apply lime and fertilizer under a regular program based on soil tests, and on the use and general appearance of the vegetative cover. In the absence of a soil test, apply lime and fertilizer as follows:

   a. Apply 1 to 2 tons of finely ground dolomite or agricultural limestone per acre or 45 to 90 lbs. per 100 square feet every 3 to 5 years.

   b. Apply 40 to 50 lbs. per acre or one pound per 1000 square feet of nitrogen, phosphate and potash annually in the spring. This can be supplied with 400 to 500 pounds per acre or 9 to 12 pounds per 1000 square feet of 10-10-10. To obtain better vegetative cover, topdress with 30 to 60 pounds per acre or 1 to 2 pounds per 1000 square feet of nitrogen during the growing season, but at least six weeks before the end of the growing season.

6. Mowing. As necessary, mow to control weeds and as growth requires. Common and Coastal may be left unmowed except for an occasional trimming to about six inches in height. Turf-type bermudagrasses should be cut to a height of 1 to 1.5 inches.

R0071534

ES BMP 1.75

MULCHING

Definition

Application of plant residues or other suitable materials to the soil surface.

Purposes

1. To prevent erosion by protecting the soil surface from raindrop impact and reducing the velocity of overland flow.

2. To foster the growth of vegetation by increasing available moisture and providing insulation against extreme heat and cold.

Conditions Where Practice Applies

1. Areas which have been permanently seeded should be mulched immediately following seeding.

2. Areas which cannot be seeded because of the season should be mulched to provide some protection to the soil surface. An organic mulch (not wood fiber alone) shall be used, and the area then seeded as soon as feasible in spring.



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3. Mulch shall be used together with plantings of trees, shrubs, or certain ground covers which do not provide adequate soil stabilization by themselves.

4. Mulch shall be used in conjunction with temporary seeding operations specified in TEMPORARY SEEDING, ES BMP 1.65.

Planning Considerations

Mulches are applied to the soil surface to conserve a desirable soil property or to promote plant growth. A surface mulch is one of the most effective means of controlling runoff on disturbed land.

Mulches can increase the infiltration rate of the soil, reduce soil moisture loss by evaporation, prevent crusting and sealing of the soil surface, modify soil temperatures, and provide a suitable microclimate for seed germination.

Organic mulch materials, such as straw, wood chips, bark, and wood fiber, have been found to be the most effective.

Chemical soil stabilizers are less effective mulches when used alone. These materials are useful to bind organic mulches together.

A variety of nets and mats have been developed for erosion control in recent years, and these are also used as mulches, particularly in critical areas such as waterways. They may be used to hold other mulches to the soil surface.

The choice of materials for mulching will be based on the type of soil to be protected, site conditions, season, and economics. It is especially important to mulch liberally in mid-summer and prior to winter, and on cut slopes and southern slope exposures.

Organic Mulches

Straw - The mulch most commonly used in conjunction with seeding. The straw should come from wheat or oats, and may be spread by hand or machine. Straw can be windblown and must be tacked down.

Corn Stalks - These should be shredded into 4 to 6-inch lengths. Stalks decompose slowly and are resistent to windblow.

Wood Chips - Suitable for areas that will not be closely mowed, and around ornamental plantings. Chips decompose slowly, do not require tacking. Must be treated with 12 pounds nitrogen per ton to prevent nutrient deficiency in plants. Can be a very inexpensive mulch if chips are obtained from trees cleared on the site.

Bark Chips, Shredded Bark - By-products of timber processing. Used in landscaping plantings. Bark is also a suitable mulch for areas planted to

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grasses and not closely mowed; may be applied by hand or mechanically. Bark is not usually toxic to grasses or legumes, and additional nitrogen fertilizer is not required.

Wood Fiber - Used in hydroseeding operations, applied as part of the slurry. These short cellulose fibers do not require tacking, although tacking agent or soil binders are sometimes used with wood fiber. This form of mulch does not provide sufficient protection to erodible soils to be used alone during the severe heat of summer or for late fall seedings. Wood fiber hydroseeder slurries may be used to tack straw mulch. This combination treatment is well suited to steep slopes and critical areas, and severe climate conditions.

There are other organic materials which make excellent mulches but are only available locally or seasonally. Creative use of these materials can reduce costs.

Chemical Mulches and Soil Binders

A wide range of synthetic, spray-on materials are marketed to stabilize and protect the soil surface. These are emulsion or dispersions of vinyl compounds, asphalt, rubber or other substances which are mixed with water and applied to the soil. They may be used alone or or may be used to tack wood fiber hydromulches or straw.

When used alone, chemical mulches do not have the capability to insulate the soil or retain soil moisture that organic mulches have. This soil protection is also damaged by traffic. Application of these mulches is usually more expensive than organic mulching, and the mulches decompose in 60-90 days.

Nets and Mats

Used alone, netting does not retain soil moisture or modify soil temperature. It stabilizes the soil surface while grasses are being established, and is useful in grassed waterways and on slopes. Light netting may also be used to hold other mulches in place.

The most critical aspect of installing nets and mats is obtaining firm, continuous contact between material and the soil. Without such contact, the material is useless and erosion occurs. It is important to use an adequate number of staples and to roll the material after laying it to insure that the soil is protected.

Specifications

ORGANIC MULCHES

Organic mulches may be used in any area where mulch is required, subject to the restrictions noted in Table 1.75a.

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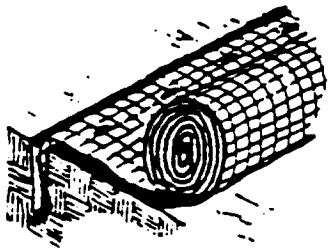
Table 1.75a

ORGANIC MULCH MATERIALS AND APPLICATION RATES

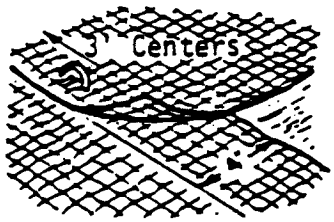
MULCHES	RATES		NOTES
	Per Acre	Per 1000 ft.^{2}	
Straw	1-1/2-2 Tons	70-90 lbs.	Free from weeds and coarse matter. Must be anchored. Spread with mulch blower or by hand.
Wood Fibers	1000-2000 lbs.	25-50 lbs.	Fibers 4 mm or longer. Do not use alone in winter or during hot, dry weather. Apply as slurry.
Corn Stalks	4-6 tons	185-275 lbs.	Cut or shrredded in 4-6" lengths. Air-dried. Do not use in fine turf areas. Apply with mulch blower or by hand.
Wood Chips	4-6 tons	185-275 lbs.	Free of coarse matter. Air-dried. Treat with 12 lbs. nitrogen per ton. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.
Bark Chips Shredded	50-70 cu. yds.	1-2 cu. yds.	Free of coarse matter. Air-dried. Do not use in fine turf areas. Apply with mulch blower, chip handler, or by hand.

Source: Va SWCC

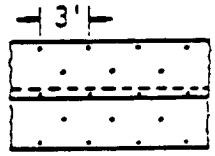
INSTALLATION OF NETTING AND MATTING

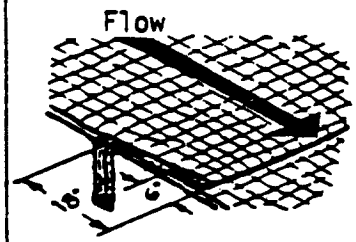


Anchor Slot: Bury the up-channel end of the net in a 6" deep trench. Tamp the soil firmly. Staple at 12" intervals across the net.

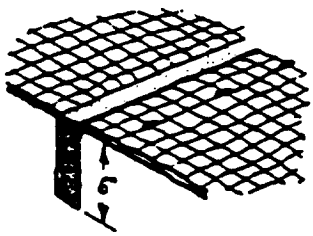


Overlap: Overlap edges of the strips at least 4". Staple every 3 feet down the center of the strip.



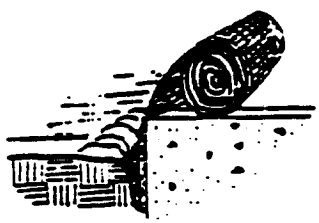


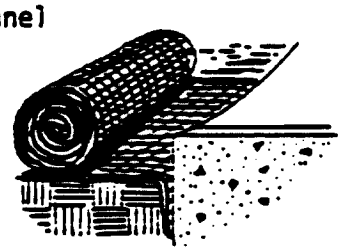
Joining Strips: Insert the new roll of net in a trench, as with the Anchor Slot. Overlap the up-channel end of the previous roll 18" and turn the end under 6". Staple the end of the previous roll just below the anchor slot and at the end at 12" intervals.



Check Slots: On erodible soils or steep slopes, check slots should be made every 15 feet. Insert a fold of the net into a 6" trench and tamp firmly. Staple at 12" intervals across the net. Lay the net smoothly on the surface of the soil - do not stretch the net, and do not allow wrinkles.

Anchoring Ends At Structures: Place the end of the net in a 6" slot on the up-channel side of the structure. Fill the trench and tamp firmly. Roll the net up the channel. Place staples at 12" intervals along the anchor end of the net.





Source: Adapted from Conwed Products Brochure

Plate 1.75a

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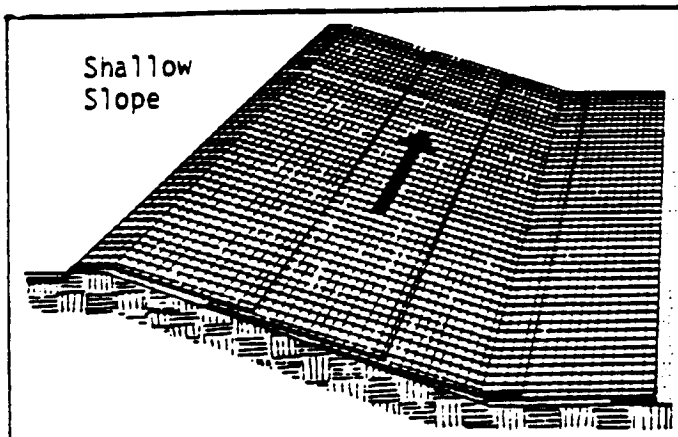
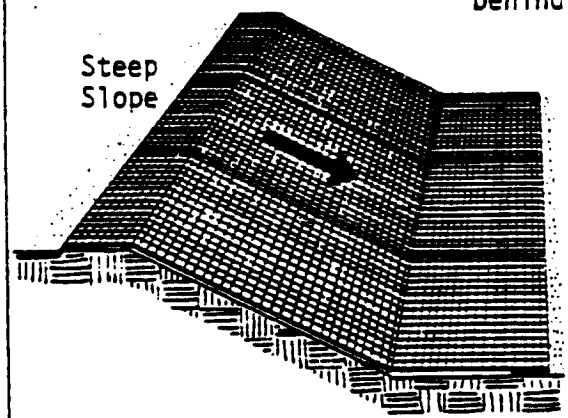


On shallow slopes, strips of netting may be applied across the slope.

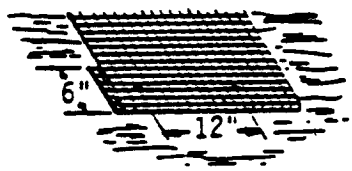
Where there is a berm at the top of the slope, bring the netting over the berm and anchor it behind the berm.

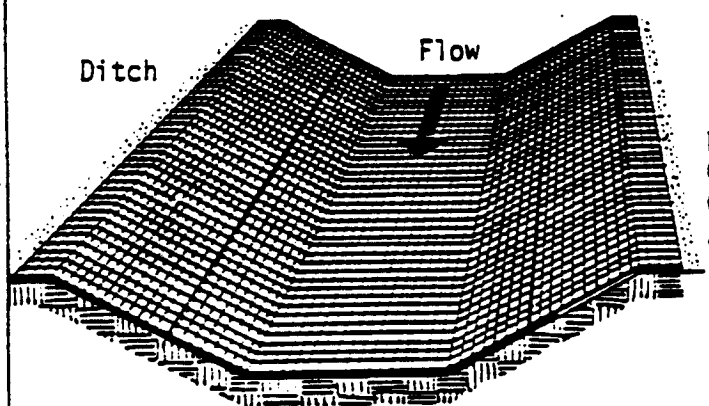




On steep slopes, apply strips of netting parallel to the direction of flow and anchor securely.

Bring netting down to a level area before terminating the installation. Turn the end under 6" and staple at 12" intervals.





In ditches, apply netting parallel to the direction of flow. Use check slots every 15 feet. Do not join strips in the center of the ditch.

ORIENTATION OF NETTING AND MATTING

Source: Adapted from Ludlow Products Brochure

Plate 1.75b

Materials: Select mulch material based on site requirements, availability of materials, and availability of labor and equipment. Table 1.75a lists the most commonly used organic mulches. Other materials, such as peanut hulls and cotton burs, may be used.

Prior to mulching: Complete the required grading and install needed sediment control practice.

Lime and fertilizer should be incorporated and surface roughening accomplished as needed. Seed should be applied prior to mulching except in the following cases: (a) Where seed is to be applied as part of a hydro-seeder slurry containing wood fiber mulch. (b) Where seed is to be applied following a straw mulch spread during winter months. (c) Where a hydro-seeder slurry is applied over straw.

Application: Mulch materials shall be spread uniformly, by hand or machine.

When spreading straw by hand, divide the area to be mulched into approximately 1000 sq. ft. sections and place 70-90 lbs. (1-1/2 to 2 bales) of straw in each section to facilitate uniform distribution.

Mulch Anchoring: Straw mulch must be anchored immediately after spreading to prevent windblow. Other organic mulches listed in Table 1.75a do not require anchoring. The following methods of anchoring straw may be used:

1. Mulch anchoring tool: This is a tractor-drawn implement designed to punch mulch into the soil surface. This method provides maximum erosion control with straw. It is limited to use on slopes no steeper than 3:1, where equipment can operate safely. Machinery shall be operated on the contour.

2. Liquid mulch binders: Application of liquid mulch binders and tackifiers should be heaviest at edges of areas and at crests of ridges and banks, to prevent windblow. The remainder of the area should have binder applied uniformly. Binders may be applied after mulch is spread or may be sprayed into the mulch as it is being blown onto the soil. Applying straw and binder together is the most effective method.

The following types of binders may be used:

   a. Asphalt - Any type of asphalt thin enough to be blown from spray equipment is satisfactory. Recommended for use are rapid curing (RC-70, RC-250, RC-800), medium curing (MC-250, MC-800) and emulsified asphalt (SS-1, CSS-1, CMS-2, MS-2, RS-1, RS-2, CRS-1, and CRS-2).

      Apply asphalt at 0.10 gallon per square yard (10 gal./1000 ft.^{2}, 480 gal./acre). Do not use heavier applications as it may cause the straw to "perch" over rills. All asphalt designations are from the Asphalt Institute Specifications.

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b. Synthetic binders - Chemical binders such as Petroset, Terratack and Aerospray may be used as recommended by the manufacturer to anchor mulch. These are expensive and therefore usually used in small areas or in residential areas where asphalt may be a problem. (Use of trade names do not constitute an endorsement by the Commission).

3. Mulch nettings - Lightweight plastic, cotton, or paper nets may be stapled over the mulch according to manufacturer's recommendations. (See NETS AND MATS, below).

4. Peg and twine - Because it is labor intensive, this method is feasible only in small areas where other methods cannot be used. Drive 8 - 10 inch wooden pegs to within 3 inches of the soil surface, every 4 feet in all directions. Stakes may be driven before or after straw is spread. Secure mulch by stretching twine between pegs in a criss-cross-within-a- square pattern. Turn twine 2 or more times around each peg.

CHEMICAL MULCHES

Chemical mulches may be used alone only in the following situations:

a. Where no other mulching material is available.

b. In conjunction with temporary seeding during the times when mulch is not required for that practice.

c. From May 1 to June 15 and September 15 to October 15, provided that they are used on areas with slopes no steeper than 4:1, which have been roughened in accordance with SURFACE ROUGHENING ES BMP 1.60. If rill erosion occurs, another mulch material shall be applied immediately.

NETS AND MATS

Nets may be used alone on level areas, on slopes no steeper than 3:1, and in waterways (as specified in STORMWATER CONVEYANCE CHANNELS, ES BMP 1.35).

When mulching is done in late fall or during June, July, or August, or where soil is highly erodible, net should only be used in conjunction with an organic mulch such as straw.

When net and organic mulch are used together, the net should be installed over the mulch except when the mulch is wood fiber. Wood fiber may be sprayed on top of the installed net.

Excelsior binders are considered protective mulches and may be used alone on erodible soils and during all times of year.

Materials: Jute net shall be heavy, uniform cloth woven of single jute yarn, which if 36 to 48 inches wide shall weigh an average of 1.2 pounds per linear yard.

Other products designed to control erosion shall conform to manufacturer's specification and should be applied in accordance with manufacturer's instructions provided those instructions are at least as stringent as this specification. Examples of these products are Erosionet, Holdgro, Weedchek, and Curlex. (Use of trade names does not indicate an endorsement of products by the department). In no case shall these products cover less than 30% of the soil surface.

Staples will be made of plain iron wire, No. 8 gauge or heavier, and will be 6 inches or more in length.

Prior to installation:

1. Shape and grade as require the waterway, channel, slope or other area to be protected.

2. Remove all rocks, clods, or debris larger than 2 inches in diameter that will prevent contact betwen the net and the soil surface.

3. When open-weave nets are used, lime fertilizer and seed may be applied either before or after laying the net. When excelsior netting is used, they must be applied before the the mat is laid.

Laying the Net

1. Start laying net from top of channel or top of slope and unroll downgrade.

2. Allow to lay loosely on soil--do not stretch.

3. To secure net: Upslope ends of net should be buried in a slot or trench no less than 6 inches deep. Tamp earth firmly over net. Staple the net every 12 inches across the top end.

   Edges of net shall be stapled every 3 feet. Where 2 strips of net are laid side by side, the adjacent edges shall be overlapped 3 inches and stapled together.

Staples shall be placed down the center of net strips at 3-foot intervals. DO NOT STRETCH net when applying staples.

Joining strips: Insert new roll of net in trench, as with upslope ends of net. Overlap the end of the previous roll 18 inches, turn under 6 inches, and staple across end of roll just below anchor slot and at the end of the turned-under net every 12 inches.

At bottom of slopes: Lead net out onto a level area before anchoring. Turn ends under 6 inches, and staple across end every 12 inches.

Check slots: On highly erodible soils and on slopes steeper than 4:1, erosion check slots should be made every 15 feet. Insert a fold of net into a 6-inch trench and tamp firmly. Staple at 12-inch intervals across the downstream portion of the net.

Rolling: After installation, stapling, and seeding, net should be rolled to ensure firm contact between net and soil.

Maintenance

All mulches should be inspected periodically, in particular after rainstorms, to check for rill erosion. Where erosion is observed additional mulch should be applied. Net should be inspected after rainstorms for dislocation or failure. If washouts or breakage occur, re-install net as necessary after repairing damage to the slope. Inspections should take place up until grasses are firmly established. Where mulch is used in conjunction with ornamental plantings, inspect periodically throughout the year to determine if mulch is maintaining coverage of the soil surface; repair as needed.

R0071544

ES BMP 1.80

TREES, SHRUBS, VINES AND GROUND COVERS

Definition

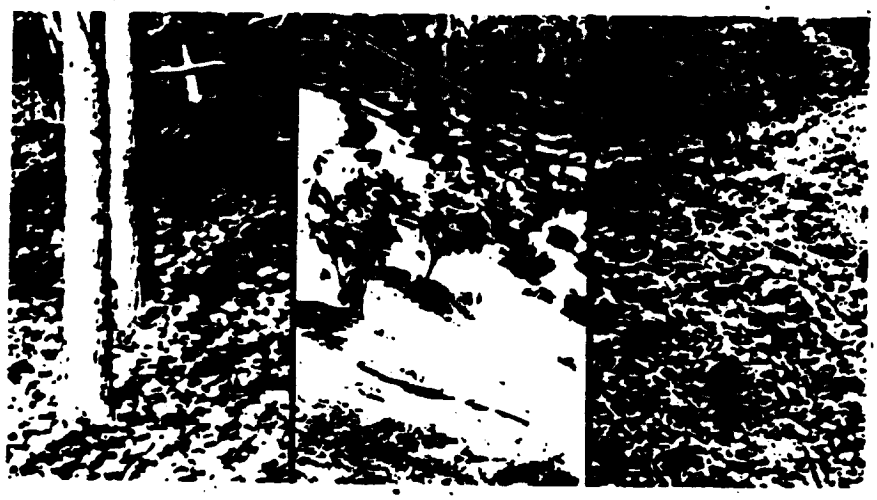
Stabilizing disturbed areas by establishing vegetative cover with trees, shrubs, vines, or ground covers.

Purposes

1. To aid in stabilizing soil in areas where vegetation other than turf is preferred.
2. To provide food and shelter for wildlife where wildlife habitat is desirable.

Conditions Where Practice Applies

1. On steep or rocky slopes, where mowing is not feasible.
2. Where ornamentals are desirable for landscaping purposes.
3. In shady areas where turf maintenance is difficult.
4. Where woody plants are desirable for soil conservation, or to establish wildlife habitats.



Planning Considerations

Disturbed areas may be stabilized in many different ways. Most frequently, a permanent vegetative cover of grasses and legumes is established. There are locations, however, where other types of vegetation are preferred. The following situations are examples of ways in which trees, shrubs, vines, and ground covers may be used:

1. On cut and fill slopes adjacent to paved areas of shopping centers, schools, industrial parks, or other non-residential projects: woody plants and ground covers can be used on these slopes to control erosion. They will also help to control foot traffic, will not require as much maintenance as mowed lawns, and will be more attractive than unmowed grass cover.

2. In residential areas, slopes too steep to be mowed and areas along rights-of-way or easements may be planted in trees, shrubs, vines, or ground covers to reduce maintenance and improve appearance.

3. The interested homeowner or small project developer may choose to use ornamental plants in problem areas--shade, steep slopes, inaccessible places--as alternatives to grass. Ground covers may be used to reduce or eliminate the need for mowing grass on level areas.

There are vast numbers of plants that may be used for these purposes. The plants discussed in this practice are those which are known to be adapted to Florida, fairly easy to grow, and commonly available from commercial nurseries. Many plants suitable for use are not mentioned here. Information on such plants can be obtained from nurserymen, landscape architects, and extension agents.

Because many types of woody plants and ground covers are discussed, and because site conditions and land use vary so widely, it is not practical to give specific requirements for the establishment of every plant mentioned. This practice consists, instead, of a set of general guidelines for growing trees, shrubs, vines, and ground covers on disturbed land.

Guidelines

Disturbed soil between trees and shrubs must be mulched or planted with permanent vegetation to prevent erosion. Refer to the other practices to select a method for stabilizing these areas.

TREES

Selecting the Right Trees - In the urban and suburban environments, trees may be exposed to insufficient light and water; high velocity winds; salt spray in coastal locations; heat radiation from roads and buildings; pollutants from cars and industry; root amputation for water, power, sewer, and gas lines; topping to prevent interference with power lines; and covering of roots by pavement. New species and varieties of trees are

being selected for the modern environment on the basis of their ability to withstand those difficult conditions and still provide the benefits associated with having trees (see Plate 1.80a).

Selection of trees depends on the desired function of the tree, whether it be shade, privacy screening, noise screening, appearance, enhancement of wildlife habitat, or a combination of these. The following characteristics of the tree should be considered when making choices:

1. Hardiness - "Hardiness zones" are based on average annual minimum temperature. Florida contains 3 such zones (Plate 1.66b) to which different trees are adapted.

2. Mature height and spread - The eventual height of a tree must be considered in relation to planting location to avoid future problems with power lines and buildings. (See Plate 1.80b).

3. Growth rate - Some trees attain mature height at an early age, others take many years. If "instant shade" is desired, rapid growth is needed. Slow-growing trees are usually less brittle and live longer.

4. Root system - Some trees obstruct underground pipelines with fibrous roots.

5. Cleanliness - Maintenance problems can be avoided by not selecting trees that drop seedpods, flowers, or twigs in large amounts.

6. Moisture and fertility requirements - If good soil and drainage are not available, trees tolerant of poor growing conditions must be planted.

7. Ornamental effects - If a tree is unusually attractive in appearance, some other shortcomings may be overlooked.

8. Evergreen vs. deciduous - Evergreens retain their leaves throughout the year, and so are useful for privacy screens and noise screens. Deciduous trees drop their leaves in fall. They are preferable for shade trees.

Some of these characteristics are given in Table 1.80a (at the end of this ES BMP) for trees commonly grown in Florida.

At the same time as trees are being selected, the site where they will be planted should be evaluated. Consider the prior use of the land; adverse soil conditions, such as poor drainage or acidity; exposure to wind; temperature extremes; location of utilities, paved areas, and security lighting; and traffic patterns.

Sources of trees and how they may be bought - The trees listed in Table 1.80a are usually available at commercial nurseries as container-grown trees or as balled and burlapped trees. Container-grown trees can be planted at any time of year if sufficient water is provided. They should be purchased and planted when quite young (less than 2" diameter trunk) to avoid dealing with root-bound plants.

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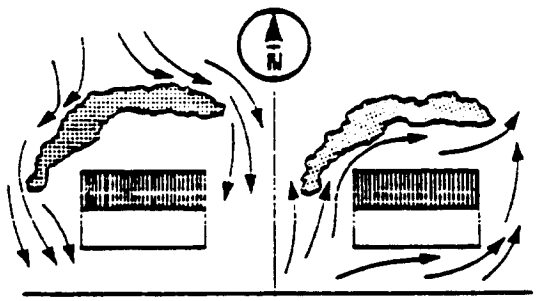
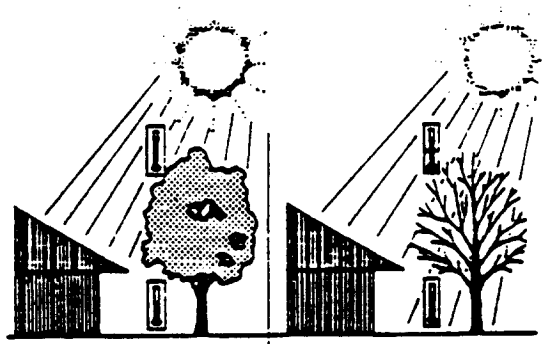
Temperature Modification

Trees affect wind speed and direction, and thus temperature. For example, an evergreen planting on the northwest side of a building will reduce the effects of harsh winter winds and direct cool summer breezes through the area. Trees protect the soil from drying sun and wind, reducing evaporation and maintaining cooler temperatures under trees. When properly placed near buildings, trees of proper size will insulate buildings from extreme temperature changes in winter and summer, helping reduce costs of heating and cooling. Deciduous trees block out the hot summer sun, keeping the home cooler, and allow warmth of winter sun to pass through.





Sound Control

Noises from nearby sources can be reduced through proper placement of trees. The degree of control depends on the density of the planting and intensity and direction of sound waves. Both deciduous and evergreen trees should be used for best effect.



Erosion Control

Coarse leaf textures, horizontal branching habits, fibrous root systems, and rough bark are tree characteristics most effective in slowing water movement and wind speed, thus reducing erosion problems.



BENEFITS OF TREES

Source: Va SWCC

Plate 1.80a

R0071548

SPACING TREES FOR SAFETY AND EFFECTIVE LANDSCAPING



Small Trees

Plant small trees a minimum of 12 feet from structures or utility wires. In rows, plant them 25 feet apart.



Medium Trees

Plant medium trees a minimum of 25 feet from structures and utility wires, and 30-50 feet apart in rows.



Large Trees

Plant large trees a minimum of 35 feet from structures and utility wires, and 50-75 feet apart when planted in rows.

Source: Va SWCC

Plate 1.80b

Balled and burlapped trees are usually larger; check to be sure that soil around roots was dug with the tree and not just packed around bare roots. The soil should have been kept moist.

Tree seedlings are available commercially and are also sold by the State Division of Forestry which has nurseries located in Munson, Chiefland and Lake Placid. About 40 species of trees are usually available at nominal prices. The minimum price is for an order of 500 trees although any number of seedlings may be ordered. Seedlings are available as bare root, containerized or potted trees with the latter two categories usually utilized in the urban environment. Orders for bare root seedlings are accepted between July 1 and March 1 with delivery occurring between late November and early March. Containerized and potted seedlings may be ordered and delivered throughout the year although high demand for these type of seedlings creates occasional delays in delivery. More information about this program is available from the Florida Division of Forestry.

PLANTING BARE-ROOTED TREE SEEDLINGS

When - Trees to be planted as bare-rooted seedlings should be handled only while dormant in spring, or after leaf fall in autumn. Refer to Plate 1.80c for planting instructions.

When stabilizing the disturbed areas between tree plantings, do not use grasses or legumes which will overshade the new seedlings. Where possible, a circle of mulch around seedlings will help them to compete successfully with herbaceous plants.

TRANSPLANTING TREES (Planting Balled-and-Burlapped and Container-grown Trees)
When - Late fall through winter (November to February) is the preferred time for planting both deciduous and evergreen trees throughout Florida.

Tree preparation - Proper digging of a tree includes the conservation of as much of the root system as possible, particularly the fine roots. Soil adhering to the roots should be damp when the tree is dug, and kept moist until planting. The soil ball should be 12 inches in diameter for each inch of diameter of the trunk. The tree should be carefully excavated and the soil ball wrapped in burlap and tied with rope. Use of a mechanical tree spade is also acceptable.

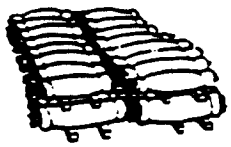
Evergreens, or any trees which are to be transplanted for a distance, should have the branches bound in with soft rope to prevent damage.

Site preparation - The planting hole should be dug deep and wide enough to allow proper placement of the root ball. The final level of the root ball's top should be level with the ground surface. (Plate 1.80d).

As the hole is dug, topsoil should be kept separate from subsoil. If possible, discard subsoil and replace with good topsoil. If topsoil is unavailable, improve subsoil by mixing in 1/3 by volume of peat moss or well-rotted manure.

R0071550

Care of Seedlings Until Planted



Seedlings should be planted immediately. If it is necessary to store moss-packed seedlings for more than 2 weeks, one pint of water per pkg. should be added. If clay-treated, do not add water to pkg. Packages must be separated to provide ventilation to prevent "heating". Separate packages with wood strips and store out of the wind in a shaded, cool (not freezing) location.

Care of Seedlings During Planting



When planting, roots must be kept moist until trees are in the ground. Do not carry seedlings in your hand exposed to the air and sun. Keep moss-packed seedlings in a container packed with wet moss or filled with thick muddy water. Cover clay-treated seedlings with wet burlap only.

Hand Planting



Insert bar at angle shown and push forward to upright position.



Remove bar and place seedling at correct depth.



Insert bar two inches toward planter from seedling.



Pull bar toward planter firming soil at bottom of roots.



Push bar forward from planter firming soil at top of roots.



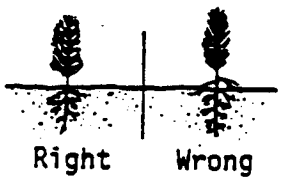
Fill in last hole by stamping with heel.



Firm soil around seedling with feet.

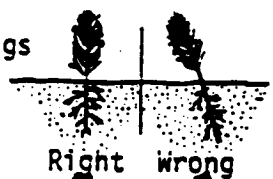


Test planting by pulling lightly on seedling.



Don't expose roots to air during freeze or plant in frozen ground.

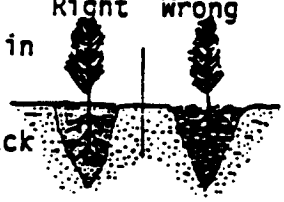
Plant seedlings upright - not at an angle.





Do not bend roots so that they grow upwards out of the ground.

Always plant in soil - never loose leaves or debris. Pack soil tightly.



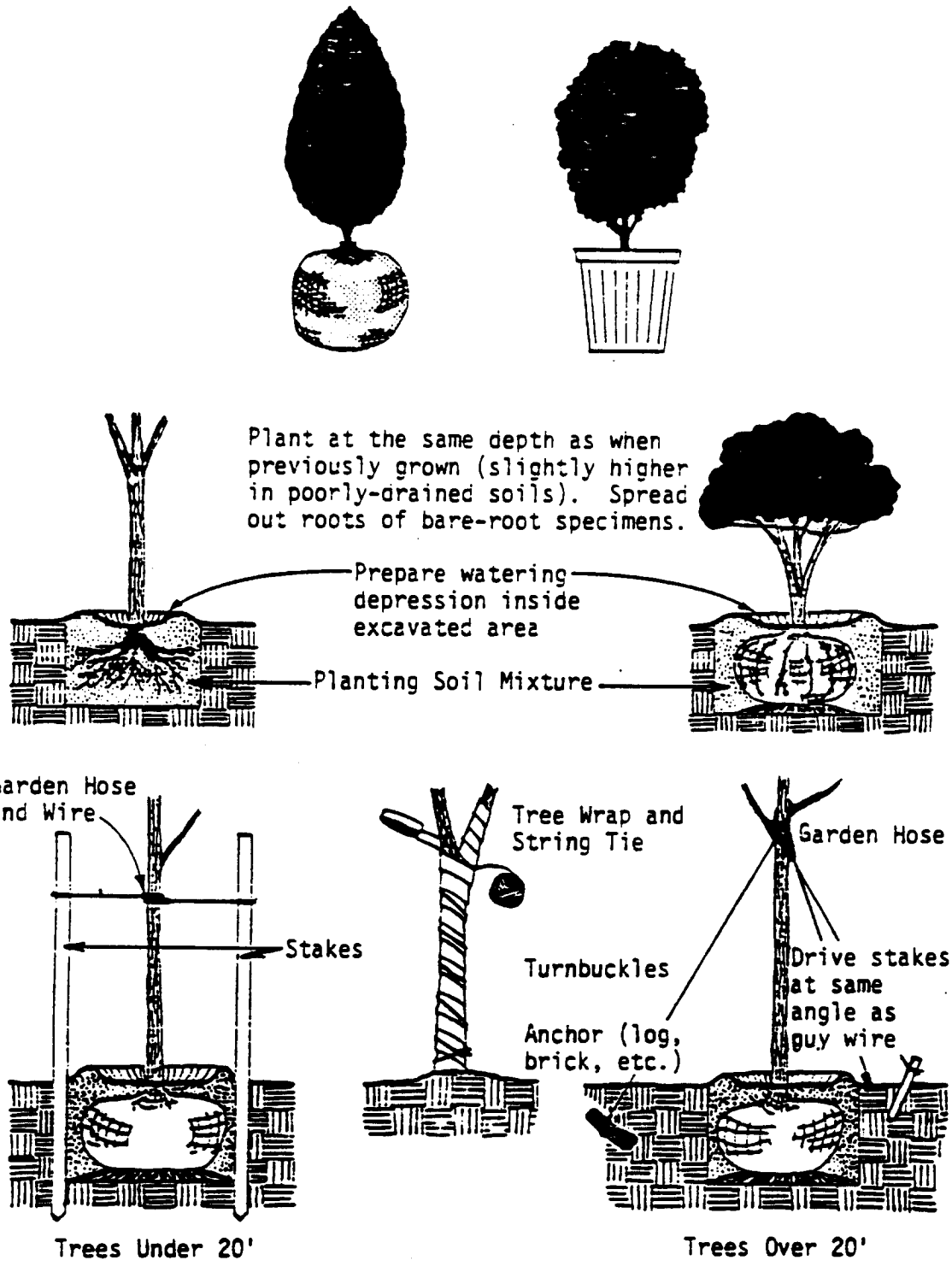
PLANTING BARE-ROOTED SEEDLINGS

Source: Virginia Division of Forestry

Plate 1.80c

R0071551

PLANTING BALLED-AND-BURLAPPED AND CONTAINER-GROWN TREES



Source: Virginia Division of Forestry

Plate 1.80d

R0071552

Heavy or poorly drained soils are not good growth media for trees. When it is necessary to transplant trees into such soils, extra care should be taken. Properly installed drain tile will improve drainage.

Setting the tree - Depth of planting must be close to the original depth. The tree may be set just a few inches higher than in its former location, especially if soil is poorly drained. DO NOT set the tree lower than before. Soil to be placed around the root ball should be moist but not wet.

Set the tree in the hole and remove the rope which holds the burlap. Loosen the burlap; remove completely if that is practical. Do not break the soil of the root ball. Fill the hole with soil half-way, and tamp firmly around the root ball. Add water to settle the soil and eliminate air pockets. When the water has drained off, fill the hole the remainder of the way and tamp as before.

Use extra soil to form a shallow basin around the tree, somewhat smaller than the diameter of the root ball (Plate 1.80d). This will be for holding water when the tree is irrigated. Note: Level the ground and eliminate these basins when winter sets in, as ice forming in the basin might injure the trunk.

Supporting the tree - Newly planted trees need artificial support to prevent excessive swaying. Stakes or guy wires may be used (see Plate 1.80d).

Watering - Soil around the tree should be thoroughly watered after the tree is set in place. When the soil becomes dry, the tree should be watered deeply but not too often. Mulching around the base of the tree is helpful in preventing roots from drying out.

Maintenance of Tree Plantings

Like all plants, trees require water and fertilizer to grow. Ideally, young trees should receive an inch of water each week for the first two years after planting. When rain does not supply this need, the tree should be watered deeply but not more often than once per week.

Transplanted trees should be fertilized one year or so after planting. There are many sophisticated ways to supply fertilizer to trees, but some simple methods are adequate. The best material for small trees is well-rotted stable manure, if it can be obtained. Add it annually as a 2-inch layer of mulch around the tree. If chemical fertilizers are to be used, a formulation such as 10-8-6 or 10-6-4 is preferred. Use about 2 lbs. per inch of trunk diameter measured 4 feet from the ground. Thus, if the trunk diameter at 4 feet was 5 inches, 10 lbs. of fertilizer would be applied.

NOTE: Evergreens use 1/2 the recommended amount of chemical fertilizer or use only organic fertilizers such as cottonseed meal, bone meal, or manure.

R0071553

Fertilizer must come in contact with the roots to benefit the tree. A simple way to insure this is to make holes in the tree's root area with a punchbar, crowbar, or auger. Holes should be 18 inches deep, spaced about 2 feet apart, and located around the drip line of the tree. Distribute the necessary fertilizer evenly into these holes, and close the holes with the heel of the shoe or by filling with topsoil or peat moss.

Fertilize trees in late fall or in early spring, before leaves emerge.

SHRUBS

Much of what has been said about trees also applies to shrubs. A shrub is an erect woody plant less than 15 feet tall, usually with several trunks rising from a common base. Some have the appearance of small trees, and some lie close to the ground.

Selecting appropriate shrubs - There are so many ornamental shrubs available that advising on the choice of any one is difficult. Table 1.80c gives the basic characteristics of shrubs commonly available at commercial nurseries in Florida, which are recommended for conservation planting because they enrich or hold the soil or encourage development of wildlife habitat. Information on other shrubs is available from nurserymen and extension agents.

Follow the general procedure for tree planting when planting shrubs.

Maintenance

Proper pruning, watering, and application of fertilizer every 3 years or so will keep shrubs healthy. Maintain the mulch cover or turf cover surrounding the shrubs. A heavy layer of mulch reduces weeds and retains moisture.

VINES AND GROUND COVERS

Low-growing plants that sprawl, trail, spread, or send out runners come in many leaf types, colors and growth habits. Some are suitable only as part of a maintained landscape, and some can stabilize large areas with little care.

In addition to stabilizing disturbed soil, vines and ground covers can perform the following functions:

1. Maintain cover in heavily shaded areas where turf will not thrive.

2. Provide attractive cover that does not need mowing.

3. Help to define traffic areas and control pedestrian movement. People are more likely to walk on the grass than on a thick bed of ivy or a prickly planting of juniper.

R0071554

Table 1.80c gives the characteristics of some commonly used vines and ground covers suitable for Florida. Information on others is available from nurserymen.

Like shrubs and trees, ground covers are best planted in spring. Containergrown plants can be planted throughout the growing season if adequate water is provided.

Site preparation - Ground covers are plants that naturally grow very close together, causing severe competition for space, nutrients, and water. Soil for ground covers should be well prepared. A well-drained soil high in organic matter is best.

The entire area should be spaded, disced or roto-tilled to a depth of six to eight inches. Two to three inches of organic material such as good topsoil, peat or well composted manure should be spread over the entire area. Apply 9-18 lbs./1000 ft^2 of 10-10-10 fertilizer and incorporate the organic material and fertilizer into the soil before planting.

If the area to be planted is very large or it is impractical to prepare the entire area, individual planting holes 1/3 larger and deeper than the plant root ball should be dug. If the soil is not suitable for plant growth, it is best to batch blend a planting medium. A mixture of 1:1 of 2:1 sandy loam soil and peat, composted manure or other well-rotted organic material with 10 pounds of 10-10-10 fertilizer and 20 lbs. lime per cubic yard of soil mix. Lime should not be used for acid loving plants such as camellias, azaleas or blueberries.

Planting - Plants such as ivy, pachysandra and periwinkle should be planted on one-foot centers; large plants such as juniper can be spaced on 3-foot centers. The following steps will help insure good plant growth:

1. Make the plantings on the contour.
2. Dig the holes 1/3 larger that the plant root ball.
3. Plant at the same level that the plants grew.
4. Use good topsoil or soil mixture with a lot of organics.
5. Fill hole 1/3 to 1/2 full, shake plants to settle soil among roots, then water. Finish filling hole, firm slightly and again settle with water.
6. Leave saucer-shaped depression around plant to hold water.
7. Water thoroughly and regularly.
8. Space plants according to the type of plant and the extent of covering desired. Set small plants as close as 4 to 6 inches apart and large plants as much as 4 feet apart. The following chart shows the area that approximately 100 plants will cover when set at various distances apart:

Planting Distance inches	Area Covered sq. ft.	Planting Distance inches	Area Covered sq. ft.
4	11	18	225
6	25	24	400
8	44	36	900
10	70	48	1600
12	100		

R0071555

Mulching - The soil between trees and shrubs must be planted with cover vegetation or must be mulched. When establishing ground covers, it is not desirable to plant species that will compete strongly with the ground cover or will make maintenance difficult. A thick durable mulch such as shredded bark or wood chips is recommended to prevent erosion and reduce weed problems. Pre-emergent herbicides may be necessary where weeding is not practical.

On slopes where erosion may be a problem, jute net or excelsior blankets may be installed prior to planting, and plants tucked into the soil through slits in the net. Such plants should be put in a staggered pattern to minimize erosion.

Maintenance

Trim old growth as needed to improve the appearance of ground covers. Most covers need once-a-year trimming to promote growth. Maintain mulch cover with additions of mulch where needed. Fertilize as described above, every 3-4 years.

R0071556

TABLE 1.80a

TREES FOR LANDSCAPING, EROSION CONTROL AND SOIL CONSERVATION IN FLORIDA

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			pH Range	(3) Tolerances			(4) Growth Rate	Uses			Comments
				Wet	M	Dry		Salt	Cold	Drought		Lawn	Street	Coast	
Birch, River (Betula nigra)	D	1,2 3N	50-80	X	X		4.0-5.0	N	H	L	M	X			Prefers deep, moist soils such as streambanks
Black Olive (Bucida buceras)	E	4 5	40-50	X	X	X	4.0-7.5	H	N	M	S	X	X	X	Excellent for windbreaks
Beech, American (Fagus grandifolia)	D	1	70-120		X		6.5-7.5	N	H	M	M	X			Long lived, has edible nuts, needs lots of space
Cedar, Southern Red (Juniperus silicicola)	E	1,2 3,4	20-50	X	X	X	6.0-6.5	M	H	H	F	X	X	X	Long lived, low maintenance tree, excellent for soil stabilization, wind breaks
Cherry Laurel (Prunus caroliniana)	E	1,2 3,4	30		X		4.5-7.5	L	H	H	F	X	X		Attractive foliage, white flowers and dark blue fruit, poisonous
Chickasaw Plum (Prunus angustifolia)	D	1,2 3,4N	25	X	X		4.5-7.5	N	H	M	M	X	X		Has showy white flowers and edible fruit
Cypress, Bald (Taxodium distichum)	D	all	100-150	X	X		4.0-7.0	L	M	L	M	X	X	X	Will tolerate wide variety of soils, very desirable for shoreline planting or wet area
Dogwood (Cornus florida)	D	1,2 3N	40-50		X		5.0-6.5	N	H	M	S	X	X		Thrives in semi-shade, white showy flowers in spring
Eastern Hophornbeam (Ostrya virginiana)	D	1 2N	20-30		X	X	5.0-6.5	N	H	H	S	X	X		Excellent landscape tree
Elm Florida (Ulmus floridana)	D	1,2 3,4	40-50	X	X		4.0-5.5	N	H	L	M	X	X		Grows best in wet hammocks

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TABLE 1.80a (Cont)

TREES FOR LANDSCAPING, EROSION CONTROL AND SOIL CONSERVATION IN FLORIDA

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			pH Range	(3) Tolerances			(4) Growth Rate	Uses			Comments
				Wet	M	Dry		Salt	Cold	Drought		Lawn	Street	Coast	
Elm Winged (Ulmus alata)	D	1,2 3	50-75		X	X	5.0-7.0	N	H	M	M	X	X		Excellent shade tree, prefers dry or well-drained soils and warm climate
Eucalyptus, Silver Dollar (Eucalyptus cinerea)	E	2,3 4,5	15-30		X	X	5.0-7.0	L	L	M	M	X	X		A popular landscape tree known for its fragrance
Geiger-Tree (Cordia sebestena)	E	4S 5	15-25		X	X	4.5-7.0	H	L	M	S	X	X	X	Orange trumpet flowers with yellowish egg shaped fruit
Golden Rain Tree (Koelreutaria elegans)	D	all	30-35		X	X	4.5-7.0	L	M	H	M	X	X		Bright yellow fall flowers, prefers well-drained soils and warm climate
Hackberry, Southern (Celtis laevigata)	D	1,2 3	60-80	X	X		4.0-6.5	L	H	M	M	X	X		
Hawthorne (Crataegus spp.)	D	1,2 3,4N	15-20		X		6.0-7.5	N	H	M	M	X	X		White flowers with red fruit, useful in urban areas such as parking lots
Hibiscus Mahoe (Hibiscus tiliaceus)	E	4S 5	25-30	X	X		5.5-7.0	H	L	M	M	X	X	X	Pale yellow flowers
Hickory (Carya spp.)	D	1,2 3,4	40-60	X	X		5.0-7.0	L	H	M	S	X	X		Several different species grow in Florida, consult nursery for best one for area
Holly, American (Ilex opaca)	E	1,2 3,4N	25-50	X	X	X	4.0-6.0	L	H	H	S	X	X		Low maintenance plant which tolerates neglect
Holly, Dahoon (Ilex cassire)	E	all	25-40	X	X		4.0-6.0	L	H	M	S	X	X		Prefers shade and moist soils, only holly with red berries common to S. Florida
Holly, Yaupon (Ilex vomitoria)	E	1,2 3	15-25	X	X	X	4.0-6.5	H	H	H	M	X	X	X	

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TABLE 1.80a (Cont)

TREES FOR LANDSCAPING, EROSION CONTROL AND SOIL CONSERVATION IN FLORIDA

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred Wet	M	Dry	pH Range	(3) Tolerances Salt	Cold	Drought	(4) Growth Rate	Uses Lawn	Street	Coast	Comments
Hornbeam (Caspinus caroliniana)	D	1,2 3,4N	25-30	X	X		6.5-7.5	N	H	L	M	X	X		Does well in shade or full sun, good tree for high water tables
Loblolly Bay (Gordonia lasianthus)	E	1,2 3,4	40-60	X	X		4.0-6.5	N	H	L	M	X	X		Large white flowers
Magnolia, Southern (Magnolia grandiflora)	E	1,2 3,4N	60-80	X	X		4.0-7.0	M	H	M	S	X	X	X	Large white fragrant flowers
Magnolia, Sweetbay (Magnolia virginiana)	E	1,2 3,4	10-30	X	X		4.0-7.0	M	H	M	S	X	X	X	
Mangrove, Black (Avicennia germinans)	E	4,5	40-60	X	X		4.0-7.0	H	L	L	S			X	Typical of intertidal zones of bays and estuaries
Mangrove, Button (Conocarpus erecta)	E	4,5	20-50	X	X		4.0-7.5	H	L	L	S			X	Of the mangroves, it is usually the one at the highest elevation
Mangrove, Red (Rhizophora mangle)	E	3S 4,5	20-50	X			4.0-7.5	H	L	L	S			X	Good choice for restoration of coastal areas and inland waterways
Mangrove, White (Laguncolaria racemosa)	E	4,5	10-30	X	X		4.0-7.5	H	L	L	S			X	Occupies slightly higher marsh behind red and black mangroves, least hardy
Oak, Blackjack (Quercus marilandica)	D	1	20-30	X	X	X	4.0-6.5	M	H	M	M	X	X		Commonly found on poor soils
Oak, Laurel (Quercus laurifolia)	E	1,2 3,4N	60-80		X	X	4.5-6.5	H	H	H	F	X	X	X	Does best in full sunlight, tolerates most soils except wet ones

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TABLE 1.80a (Cont)

TREES FOR LANDSCAPING, EROSION CONTROL AND SOIL CONSERVATION IN FLORIDA

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred Wet	M	Dry	pH Range	(3) Tolerances Salt	Cold	Drought	(4) Growth Rate	Uses Lawn	Street	Coast	Comments
Oak, Live (Quercus virginiana)	E	all	50-70		X	X	4.5-6.5	M	H	H	M	X	X	X	Highly valued shade tree with wide spreading crown, long lived
Oak, Myrtle (Quercus myrtifolia)	E	2,3 4	20-40			X	4.0-7.0	H	H	H	M	X	X	X	Prefers well-drained soils
Oak, Swamp Chestnut (Quercus michauii)	D	1,2 3N	50-70	X	X		3.5-6.5	N	H	L	M	X	X		Prefers moist bottomland soils
Oak, Turkey (Quercus laevis)	D	1,2 3,4	20-30			X	4.0-7.0	N	H	H	M	X	X		Prefers well-drained sandy soils
Oak, Water (Quercus nigra)	D	1,2 3	60-70	X	X		3.5-7.0	M	H	M	F	X	X		Common to bottomlands
Palm Tree	E	2,3 4,5	50-100		X	X	4.0-7.0	M-H	L	M	M	X	X	X	Many varieties are suitable for use throughout Florida, consult a nursery for site-specific advice
Paradise Tree (Simarouba glavca)	E	4S 5	40-50		X	X	4.0-6.5	M	L	M	S	X	X	X	Yellow flowers in spring, prefers hammock soils
Pigeon Plum (Coccoloba diversifolia)	E	4S 5	20-40		X	X	4.0-6.5	H	L	M	M	X	X	X	Excellent for home or median landscaping
Pine, Loblolly (Pinus taeda)	E	1,2 3,4N	90-100	X	X	X	4.0-6.5	M	H	M	M			X	An important timber tree
Pine, Longleaf (Pinus palustris)	E	1,2 3,4N	75-120		X		4.0-6.5	M	H	M	M	X		X	An important timber tree

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TABLE 1.80a (Cont)

TREES FOR LANDSCAPING, EROSION CONTROL AND SOIL CONSERVATION IN FLORIDA

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred Wet	M	Dry	pH Range	(3) Tolerances Salt	Cold	Drought	(4) Growth Rate	Uses Lawn	Street	Coast	Comments
Pine, Sand (Pinus clausa)	E	2,3 4	50-70			X	3.5-6.5	M	H	H	F	X		X	Will not tolerate wet soils
Pine, Slash (Pinus elliotti)	E	all	70-90	X	X	X	4.0-6.5	M	H	M	F	X		X	Prefers moist soils
Pine, Spruce (Pinus glabra)	E	1,2	80-100	X	X		4.0-6.5	M	H	M	M	X	X	X	Common in rich hammocks and swamps
Redbud (Cercis canadensis)	D	1,2 3	25-50		X	X	4.0-7.0	L	H	M	M	X	X		A beautiful tree with pink flowers in spring
Red Maple (Acer rubrum)	D	all	50-70	X	X		4.5-7.5	M	H	M	F	X	X	X	Does not do well on sandy ridge soils
Red Mulberry (Morus rubra)	D	all	40-50	X	X	X	4.0-7.5	N	H	M	F	X	X		Prefers fertile, moist soils, edible fruit
Sassafras (Sassafras albidum)	D	1,2 3	20-40		X	X	3.5-7.0	N	H	H	F	X	X		Provides good fall color
Sweet Acacia (Acacia farnesiana)	D	4S 5	20		X	X	4.0-6.5	H	L	H	F	X	X	X	Does well on dry sites, yellow spring flowers
Sweet Gum (Liquidambae styracifula)	D	1,2 3,4N	80-120	X	X	X	6.0-7.5	L	H	H	F	X	X		Very adaptable, good shade tree
Sycamore (Platanus occidentalis)	D	1,2 3	80-100	X	X	X	6.0-7.5	M	H	M	F	X	X		Typical of creek bottoms but highly adaptable

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R0071561

TABLE 1.80a (Cont)

TREES FOR LANDSCAPING, EROSION CONTROL AND SOIL CONSERVATION IN FLORIDA

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred Wet	M	Dry	pH Range	(3) Tolerances Salt	Cold	Drought	(4) Growth Rate	Uses Lawn	Street	Coast	Comments
Tulip Tree (Liriodendron tulipifera)	D	1,2 3	80-100	X	X		5.5-7.0	N	H	H	F	X		X	Attractive flowers
Tupelo, Black (Nyssa sylvatica)	D	1,2 3,4	60-80	X	X		5.0-6.0	N	H	M	M	X		X	Suitable for wet areas
Walnut, Black (Juglans nigra)	D	1,2	50-70		X	X	4.5-6.5	L	H	M	M	X		X	Best on fertile, well-drained soils
Willow (Salix spp.)	D	all	30-50	X	X		4.0-7.0	N	H	L	M	X		X	Prefers moist or wet areas
White Fringe (Chionanthus virginian)	D	1,2 3,4N	20-40	X	X		4.0-7.0	N	H	L	M	X		X	Fragrant white flowers

(1) Leaf Type: D = Deciduous; E = Evergreen
(2) Climate Zones: Refer to Plate 1.80E
(3) Tolerances: N = None; L = Low; M = Medium; H = High
(4) Growth Rate: S = Slow; M = Medium; F = Fast

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TABLE 1.80b

SHRUBS FOR VEGETATING DISTURBED AREAS

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred Wet	M	Dry	(3) Tolerances Light	Salt	Drought	Uses Under Trees	Slopes	Hedge	Coast	Comments
American Beautybush (Callicarpa americana)	D	1,2 3	5		X	X	PS	N	M	X	X			Lilac spring flowers with fruit in autumn
Azalea (Rhododendron spp)	E D	1,2 3,4N	6		X	X	PS	N	M	X	X	X		Require acid soils, Krume and Satsuki hybrid varities are small, more spreading, beautiful flowers
Bamboo (Bambusa spp)	E	2,3 4,5	10		X	X	PS	N	M	X	X	X		Spreads rapidly, requires mowing or other measures to restrict growth
Barberry (Berberis spp)	E	1,2 3	7		X	X	PS	M	M	X	X	X		Many varieties
Bay Cedar (Suriana maritima)	D	4S 5	15		X	X	S	H	H		X	X	X	Yellow flowers in spring
Blueberry (Vaccinium spp)	E	1,2 3,4N	10		X	X	PS	N	M	X	X			Require acid soils, white flowers in spring with edible fruit in summer
Bougainvillea (Bougainvillea spp)	E	3S 4S,5	6		X	X	PS	M	M	X	X	X		Many varieties, showy flowers
Boxwood (Buxus spp)	D	1,2 3N,4N	4			X	SH	N	H	X	X	X		Slow growing, should be mulched
Cocoplum (Chrysobalanus icaco)	E	3S 4,5	10		X	X	S	H	H		X	X	X	Two types-inland and coastal, white spring flowers
Coontie (Zamia spp)	E	all	3		X	X	SH	H	M	X	X	X	X	Does well in full sun or full shade

R0071563

TABLE 1.80b

SHRUBS FOR VEGETATING DISTURBED AREAS (Cont.)

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Hedge	Coast	
Coralberry (Symphoricarpos chenaultii)	D	1,2 3	3		X	X	SH	M	M	X	X	X		Does well in poor soils
Creeping Euonymous (Euonymous fortunei)	E	1,2 3	3		X		SH	M	M	X	X		X	Fast grower
Crepe Myrtle (Lagerstroemia indica)	D	all	10		X	X	S	L	M		X	X	X	Showy summer flowers
Down Myrtle (Rhodomyrtus tomentosa)	D	3S 4,5	10		X	X	PS	N	M	X	X			Attractive flowers
Eastern Coralbean (Erythrina herbacea)	D	all	5		X	X	PS	N	M		X	X		Red spring flowers
Firebush (Hamelia patens)	E	3S 4,5	10		X	X	PS	M	M	X	X		X	Red flowers and black fruit
Firethorn (Pyracantha spp)	E	all	8		X	X	S	M	H		X	X	X	White flowers, red-orange fruit
Florida Chinkapin (Castanea floridana)	D	all	4			X	PS	N	M		X			Attractive flowers, fruit
Glossy Abelia (Abelia grandiflora)	E	1,2	8		X	X	PS	M	M		X		X	Pink, white summer flowers
Hibiscus (Hibiscus spp)	E	3S 4,5	6		X	X	S	L	M		X	X		Many varieties and colors, fast growing

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TABLE 1.80b

SHRUBS FOR VEGETATING DISTURBED AREAS (Cont.)

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Hedge	Coast	
Hydrangea (Hydrangea spp)	D	1,2 3,4N	6			X	PS	N	H	X	X			Flower color varies with soil pH
Ixora (Ixora spp)	E	3,4 5	6		X	X	S	M	M		X		X	Acid soils preferred
Jasmine (Jasminum spp)	E	all	6		X	X	PS	M	M		X		X	Many varieties, flowers
Juniper (Juniperus spp)	E	all	3			X	PS	M	M		X	X		Prefer acid soils, many varieties
Lantana (Lantana spp)	E	all	5		X	X	S	H	M		X		X	Many varieties, summer flowers, L. depressa good for ground cover
Oleander (Nerium oleander)	E	all	10		X	X	S	H	M		X	X	X	Poisonous plant, varied flower color
Philodendrum (Philodendron spp)	E	2S,3 4,5	10	X	X		PS	N	L		X	X		Many varieties, P. selloum will recover from freeze
Privet (Lugustum spp)	E	all	10	X	X	X	PS	L	M	X	X	X		Many varieties, fragrant flowers
Sea Lavender (Tournefortia gnaphalodes)	E	4,5	4			X	S	H	H		X		X	White flower clusters
Serissa (Serissa foetida	D	1,2 3	2		X	X	PS	N	M		X	X		Pink and white flowers

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TABLE 1.80b

SHRUBS FOR VEGETATING DISTURBED AREAS (Cont.)

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Hedge	Coast	
Silverthorn (Elaeagnus pungens)	E	1,2 3,4N	10		X	X	PS	H	H	X	X	X	X	Fast grower
Spirea (Spiraea spp)	D	1,2 3	6		X	X	PS	N	M		X	X		White spring flowers
Strawberry Bush (Euonymus americana)	D	1,2 3N	8		X	X	PS	N	M	X	X			Pink fruit in summer
Tea Olive (Osmanthos fragrens)	D	1,2 3N	6		X	X	PS	N	M	X	X			Fragrant white spring flowers
Viburnum (Viburnum spp)	E	all	6		X	X	PS	M	M	X	X	X		Many varieties, attractive flowers
Wax Mrytle (Myrica cerifera)	E	all	15	X	X	X	PS	H	M		X	X	X	Many varieties, aromatic

(1) Leaf Type: D = Deciduous; E = Evergreen
(2) Climate Zones: Refer to Plate 1.80E
(3) Tolerances: a) Light: S = Sun; PS = Partial Shade; SH = Shade
b) Salt, Drought: N = None; L = Low; M = Medium; H = High

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TABLE 1.80c

GROUND COVERS AND VINES FOR CONSERVATION PLANTINGS

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Open Area	Coast	
Aloe (Aloe spp.)	E	3S 4,5	1		X	X	PS	H	M		X	X	X	Spectacular flowers, medicinal properties
Artillery Plant (Pilea microphylla)	D	4S 5	1		X	X	PS	N	L	X		X		Requires care for optimum growth
Beach Morning-Glory (Ipomoea pescaprae)	D	all	.5			X	S	H	M		X	X	X	Lavender flowers, native to Florida beaches
Beggarweed (Desmodium cara)	E	3,4 5	1	X	X		PS	N	M		X	X		
Bromeliads (Bromeliaecae)	E	3S 4,5	3		X	X	PS	L	M	X		X		Members of genus Crypanthus good as ground cover
Bugle Weed (Ajuga reptans)	E	all	1		X	X	SH	N	L	X	X	X		Fast growing, blue summer flowers
Bush Pereskia (Pereskia grandiflora)	E	3S 4,5	2		X	X	PS	N	M	X	X	X		Injured by cold, white or pink flowers
Cape Weed (Phyla nodiflora)	E	all	.5		X	X	SH	H	H	X	X	X	X	Fast growing, good substitute for lawngrass, pink flowers in summer
Carolina Yellow Jessamine (Gelsemium sempervirens)	E	all	1		X		PS	N	M	X	X	X		Slow growing, poisonous, yellow spring flowers
Cestrum (Cestrum spp.)	E	4S 5	2		X	X	PS	N	M	X	X	X		Orange or purple flowers

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TABLE 1.80c

GROUND COVERS AND VINES FOR CONSERVATION PLANTINGS (Cont.)

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Open Area	Coast	
Confederate Jasmine (Trachelospermum jasminoides)	E	all	1	X	X	X	SH	M	M		X	X		Variety variegatum is good as ground cover Variety asiaticum forms dense mat
Cotoneaster (C. microphylla)	D	all	3		X		PS	N	M		X	X		Self-seeding, red berries
Creeping Charlie (Pilea nummulariifolia)	E	4S 5	.5			X	SH	N	M	X		X		Can become a weed problem
Creeping Fig (Ficus pumilia)	E	all	1	X	X	X	PS	H	M		X		X	Vigorous growth, light and soil conditions not critical for growth
Creeping Thyme (Thymus serpyllum)	E	all	.5		X	X	PS	N	H			X	X	Purple flowers
Daylily (Hemerocallis spp.)		all	3		X	X	S	M	L		X	X		Colorful spring-summer flowers
Dichondria (D. carolinensis)	E	all	.5		X	X	SH	H	M	X	X	X	X	Does well in shade or sun
Ferns (Polypodiaceae)	E	all	3		X	X	SH	L	M	X				Many varieties with different tolerances
Fig Marigold (Glottiphyllum depressum)	E	3S 4,5	.5			X	S	H	H		X	X	X	Withstands dry sandy soils, yellow flowers

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TABLE 1.80c

GROUND COVERS AND VINES FOR CONSERVATION PLANTINGS (Cont.)

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Open Area	Coast	
Hottentot Fig (Carpobrotus edulis)	E	3S 4,5	..5			X	S	H	H		X	X	X	Excellent for covering sandy areas, seashor
Goldmoss Stonecrop (Sedum acre)	E	all	.5			X	PS	L	H		X	X		Forms thick mats of foliage
Gopher Apple (Chrysobalanus oblongifolius)	E	all	1			X	S	H	M		X	X	X	Native to pinelands and sand dunes, white and pink flowers
Honeysuckle, Cape (Tecomaria capensis)	E	3S 4,5	6		X	X	S	H	M		X	X	X	Orange-red flowers
Honeysuckle, Japanese (Lonicera japonica)	E	1,2 3,4N	6		X	X	PS	M	H		X		X	Yellow spring flowers, can become nuisance
Honeysuckle, Southern (Lonicera sempervirens)	D	1,2 3,4N	20		X	X	PS	N	M	X	X			Red summer flowers
Iceplant (Mesembryanthemum crystallium)	E	all	3		X	X	PS	N	M	X	X	X		An excellent ground cover for banks and roadsides
Ivy, Algerian (Hedera canariensis)	E	all	1		X	X	SH	H	H	X	X			Fast growing cover, best adapted to norther part of state
Ivy, English (Hedera helix)	E	all	1		X	X	SH	H	H	X	X			Has smaller leaves than Algerian Ivy, provides finer texture planting

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TABLE 1.80c

GROUND COVERS AND VINES FOR CONSERVATION PLANTINGS (Cont.)

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Open Area	Coast	
Partridgeberry (Mitchella repens)	E	1,2 3,4N	.2	X	X		SH	N	M	X	X			Grows best in acid soils in the shade, tolerates foot traffic, red berries
Periwinkle (Vinca minor)	E	1,2 3,4	2		X	X	SH	N	H	X	X			Many varieties and colors
Purple Queen (Setcreasea pallida)	E	all	1		X	X	PS	M	M	X		X	X	Pink summer flowers, purple leaves
Rhizoma Peanut (Arachis glabrata)	D	all	1		X	X	S	N	H		X	X		Florigraze variety, yellow flowers, does not do well in wet soils, perennial
Selaginella (Selaginella spp.)	E	all	1	X	X		SH	N	L	X	X			Erect form (S. caulescens) good around trees blue form (S. uncinata) good for slopes
Sericea Lespedeza (Lespedeza cuneata)	D	all	3		X	X	S	N	M		X	X		A widely used perennial for conservation plantings
Small Leaf Confedeate Jasmine (Trachelospermum asiaticum)	E	all	1		X	X	SH	H	M	X	X		X	Forms a thick mat ground cover
Spider Lily (Hymenocallis keyensis)	D	3,4 5	3	X	X		PS	H	L	X			X	Showy white flowers
Swamp Lily (Crinum americanum)	D	all	4	X			PS	N	L	X				Showy white flowers

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TABLE 1.80c

GROUND COVERS AND VINES FOR CONSERVATION PLANTINGS (Cont.)

Common Name (Botanical Name)	(1) Leaf Type	(2) Climate Zones	Mature Size-Ft.	Soil Moisture Preferred			(3) Tolerances			Uses				Comments
				Wet	M	Dry	Light	Salt	Drought	Under Trees	Slopes	Open Area	Coast	
Virginia Creeper (Parthenocissus quinquefolia)	D	1,2 3	1		X	X	PS	H	M	X	X	X		Similar leaf to poison ivy but with 5 leaflets, not 3
Wandering Jew (Zebrina pendula)	E	2S,3 4,5	1		X	X	SH	M	M	X	X	X		Hurt by frost, attractive varigated leaves
Wedelia (W. teilobata)	E	3S 4,5	1	X	X	X	PS	H	M	X	X	X	X	Daisy-like flowers, very useful on dunes, fast growing

(1) Leaf Type: D = Deciduous; E = Evergreen
(2) Climate Zones: See plate 1.80E
(3) Tolerances: Light: S = Sun; PS = Partial Shade; SH = Shade
Salt: N = None; L = Low; M = Moderate; H = High
Drought: L = Low; M = Moderate; H = High

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ES BMP 1.85

TREE PRESERVATION AND PROTECTION

Definition

Protection of desirable trees from mechanical and other injury during land disturbing and construction activity.

Purpose

To ensure the survival of desirable trees where they will be effective for erosion and sediment control, watershed protection, landscape beautification, dust and pollution control, noise reduction, shade and other environmental benefits while the land is being converted from forest to urban-type uses.

Conditions Where Practice Applies

Tree-inhabited areas subject to land disturbing activities.



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Planning Considerations

New development often takes place on tracts of forested land. In fact, building sites are often selected because of the presence of mature trees. However, unless sufficient care is taken and planning done, in the interval between buying the property and completing construction much of this resource is likely to be destroyed. The property owner is ultimately responsible for protecting as many trees as possible, with their understory and ground cover. This responsibility is usually exercised by agents--the planners, designers and contractors. It takes 20 to 30 years for newly planted trees to provide the benefits for which we value trees so highly. Trees may perform the following functions on a site:

1. Assist in stabilizing the soil and preventing erosion.

2. Help to decrease stormwater runoff through canopy interception and root zone absorption.

3. Moderate temperature changes and provide shade.

4. Moderate the effects of sun and wind.

5. Provide buffers and screens against noise.

6. Filter pollutants from the air.

7. Help to remove carbon dioxide from the air and release oxygen.

8. Provide a haven for animals and birds, which help to control insect populations.

9. Conserve and increase property values.

10. Provide physiological and aesthetic counterpoints to a man-made urban setting.

Stresses of Construction

Trees may appear to be inanimate objects, but they are living organisms that are constantly involved in the process of respiration, food processing and growth. Construction activities expose trees to a variety of stresses resulting in injury ranging from superficial wounds to death. An understanding of these stresses is helpful in planning for tree protection.

1. Surface Impacts: Natural and man-related forces exerted on the tree above the ground can cause significant damage to trees.

    a. Wind damage - Removal of some trees from groups will expose the survivors to greater wind velocities. Trees tend to develop anchorage where it is most needed. Isolated trees develop anchorage rather equally all around, with stronger root development on the side of the prevailing winds.

Tne more a tree is protected from the wind, the less secure is its anchorage. The result of improper thinning is often windthrown trees. Selective removal in favor of a single tall tree may also create a lightning hazard.

b. Excessive pruning - Unprotected trees are often "topped" or carelessly pruned to prevent interference with utility wires or buildings. If too many branches are cut, the tree may not be able to sustain itself. If the pruning is done without considering the growth habit, the tree may lose all visual appeal. If the branches are not pruned correctly, decay may set in.

c. Trunk damage - Tree trunks are often nicked or scarred by trucks and construction equipment. Such superficial wounds provide access to insects and disease.

2. Root Zone Impacts: Disturbing the delicate relationship between soil, roots and the rest of the tree can damage or kill a tree. The roots of an existing tree are established in an area where essential materials--water, oxygen and nutrients--are present. The mass of the root system is the correct size to balance the intake of water from the soil with the transpiration of water from the leaves.

a. Raising the grade as little as 6 inches can retard the normal exchange of air and gases. Roots may suffocate due to lack of oxygen, or be damaged by toxic gases and chemicals released by soil bacteria.

b. Raising the grade may also elevate the water table. This can cause drowning of the deeper roots.

c. Lowering the grade is not usually as damaging as raising it. However, even shallow cuts of 6 to 8 inches will remove most of the topsoil, removing some feeder roots and exposing the rest to drying and freezing.

d. Deep cuts may sever a large portion of the root system, depriving the tree of water and increasing the chance of wind-throw.

e. Lowering the grade may lower the water table, inducing drought. This is a problem in large roadway cuts or underdrain installations.

f. Trenching or excavating through a tree's root zone can eliminate as much as 40 percent of the root system. Trees suffering such damage usually die within 2 to 5 years.

g. Compaction of the soil within the drip line of a tree by equipment operation, materials storage, or paving can block off air and water from roots.

h. Construction chemicals or refuse disposed of in the soil can change soil chemistry or be toxic to trees.

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Most damage to trees from construction activities is due to the invisible root zone stresses.

Design Criteria

No formal design is required. However, in planning for the development of a wooded site where some trees will be preserved, a number of criteria must be considered.

Selecting Trees to be Retained

The proper development of a wooded site requires completion of a plan for tree preservation before clearing and construction begins. Trees should be identified by species, and located on a topographical map, either as stands or as individuals, depending on the density and value of the trees. The following factors should be considered when deciding which trees to retain:

1. Life expectancy and present age: Preference should be given to trees with a long life span, such as white oak, beech, and maple. Long-lived specimens that are past their prime may succumb to the stresses of construction, so smaller, younger trees of desirable species are preferred; they are more resilient and will last longer. However, if the cost of preservation is greater than the cost of replacement with a specimen of the same age and size, replacement may be preferred.

2. Health and disease susceptibility: Check for scarring caused by fire or lightning, insect or disease damage, and rotted or broken trunks or limbs. Pest- and pollution-resistant trees are preferred.

3. Structure: Check for structural defects that indicate weakness or reduce the aesthetic value of a tree: trees growing from old stumps, large trees with overhanging limbs that endanger property, trees with brittle wood, misshapen trunks or crowns, and small crowns at the top of tall trunks. Open grown trees often have better form than those grown in the woods. Trees with strong tap or fibrous root systems are preferred to trees with weak rooting habits.

4. Cleanliness: Some trees such as elm and black locust are notoriously "dirty," dropping twigs, bark, fruit, or plant exudates. A clean tree is worth more than a dirty one. Trees which seed prolifically or sucker profusely are generally less desirable in urban areas. Thornless varieties are preferred.

5. Aesthetic values: Handsome bark and leaves, net growth habits, fine fall color, and attractive flowers and fruit are desirable characteristics. Trees that provide interest during several seasons of the year enhance the value of the site.

6. Comfort: Trees relieve the heat of summer and buffer strong winds throughout the year. Summer temperatures may be 10 degrees cooler under hardwoods than under conifers. Deciduous trees drop their leaves in winter, allowing the sun to warm buildings and soil. Evergreens are more effective wind buffers.

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7. Wildlife: Preference should be given to trees that provide food, cover, and nesting sites for birds and game.

8. Adaptability to the proposed development:

   a. Consider the mature height and spread of trees; they may interfere with proposed structures and overhead utilities. Roots may interfere with walls, walks, driveways, patios, and other paved surfaces; or water lines, septic tanks, and underground drainage.

   b. Trees must be appropriate to the proposed use of the development; select trees which are pollution-tolerant for high traffic and industrial areas, screen and buffer trees for noise or objectionable views, salt-tolerant species exposed to ocean spray.

   c. Consider location of landfills. Gases generated in them can travel long distances underground, to injure distant trees. Choose species tolerant of anaerobic soil conditions.

   d. Determine the effect of proposed grading on the water table. Grading should not take place within the drip line of any trees to be saved.

9. Survival needs of the tree: Chosen trees must have enough room to develop naturally. They will be subject to injury from increased exposure to sunlight, heat radiated from buildings and pavement, and wind. It is best to retain groups of trees rather than individuals. As trees mature, they can be thinned gradually.

10. Relationship to other trees: Individual species should be evaluated in relation to other species on the site. A species with low value when growing among hardwoods will increase in value if it is the only species present. Trees standing alone generally have higher landscape value than those in a wooded situation. However, tree groups are much more effective in preventing erosion and excess stormwater runoff.

Site Planning for Tree Protection

1. If lot size allows, select tree to be saved before siting the building. No tree should be destroyed or altered until the design of the buildings and utility systems is final.

2. Critical areas, such as flood plains, steep slopes, and wetlands, should be left in their natural condition or only partially developed as open space.

3. Locate roadways to cause the least damage to valuable stands. Follow original contours, where feasible, to minimize cuts and fills.

4. Minimize trenching by locating several utilities in the same trench. Excavations for basements and utilities should be kept away from the drip line of trees.

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5. Construction material storage areas and worker parking should be noted on the site plan, and located where they will not cause compaction over roots.

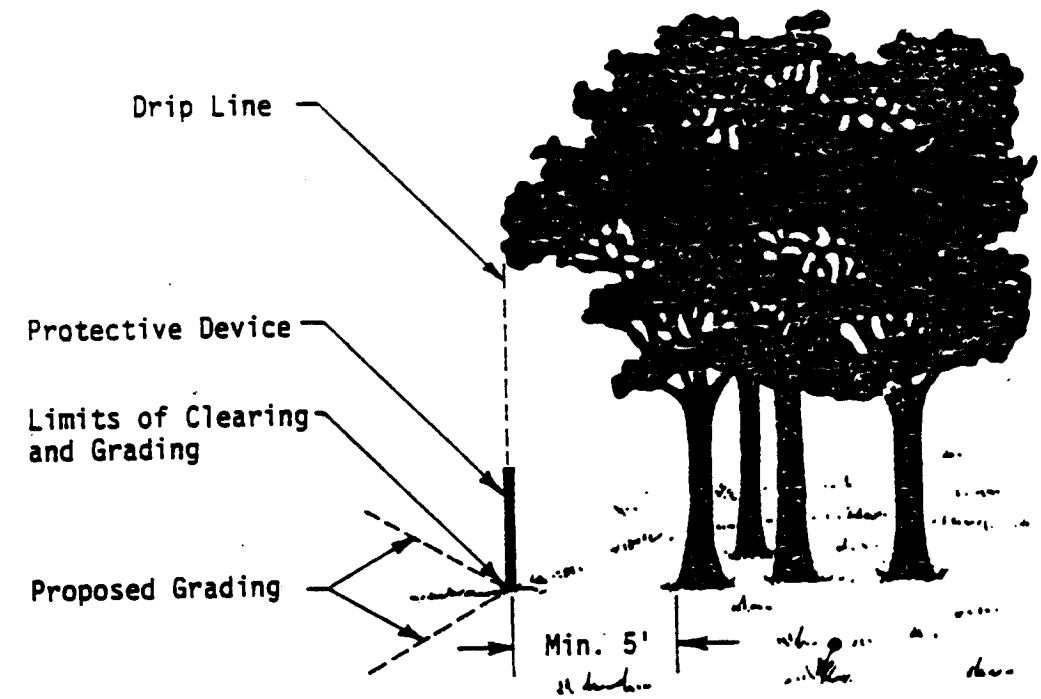
6. When retaining existing trees in parking areas, leave enough ground ungraded around the tree to allow for its survival.

7. Locate erosion and sediment control measures at the limits of clearing and not in wooded areas, to prevent deposition of sediment within the drip line of trees being preserved. Sediment basins should be constructed in the natural terrain, if possible, rather than in locations where extensive grading and tree removal will be required.

Specifications

1. Groups of trees and individual trees selected for retention shall be accurately located on the plan and designated as "tree(s) to be saved." Individual specimens that are not part of a tree group shall also have their species and diameter noted on the plan.

2. The limits of clearing shall be located outside the drip line of any tree to be retained, and in no case closer than 5 feet to the trunk of such a tree (Plate 1.85a).



CONSTRUCTION OPERATIONS RELATIVE TO THE LOCATION OF PROTECTED TREES

Source: Public Facilities Manual, Vol. III, Fairfax County, Virginia 1976

Plate 1.85a

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3. Marking: Prior to construction and before the preconstruction conference, individual trees and stands of trees to be retained within the limits of clearing shall be visibly marked with a bright color paint or surveyor's ribbon applied in a band circling the tree at a height visible to equipment operators.

4. Pre-Construction Conference: During any preconstruction conference, tree preservation and protection measures should be reviewed with the contractor as they apply to that specific project.

5. Equipment Operation and Storage: Heavy equipment, vehicular traffic or stockpiles of any construction material including topsoil shall not be permitted within the drip line of any tree to be retained. Trees being removed shall not be felled, pushed or pulled into trees being retained. Equipment operators shall not clean any part of their equipment by slamming it against the trunks of trees to be retained.

6. Fires: Fires shall not be permitted within 100 feet from the drip line of any trees to be retained. Fires shall be limited in size to prevent adverse effects on trees, and kept under surveillance.

7. Storage and Disposal of Toxic Materials: No toxic materials shall be stored closer than 100 feet to the drip line of any trees to be retained. Paint, acid, nails, gypsum board, wire, chemicals, fuels, and lubricants shall not be disposed of in such a way as to injure vegetation.

8. Fencing and Armoring: (Plate 1.85b): Any device may be used which will effectively protect the roots, trunk and tops of trees retained on the site. However, trees to be retained within 40 feet of a proposed building or excavation shall be protected by fencing. Personnel must be instructed to honor protective devices. The devices described are suggested only, and are not intended to exclude the use of other devices which will protect the trees to be retained.

   a. Field fence - Standard 48 inch high field fence shall be placed at the limits of the clearing on standard steel posts set 6 feet apart.

   b. Board Fence - Board fencing consisting of 4 inch square posts set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with a minimum of two horizontal boards between posts. If it is not practical to erect a fence at the drip line, construct a triangular fence nearer the trunk. The limits of clearing within the drip line will still require protection.

   c. Cord Fence - Posts with a minimum size of 2 inches square or 2 inches in diameter set securely in the ground and protruding at least 4 feet above the ground shall be placed at the limits of clearing with two rows of cord 1/4 inch or thicker at least 2 feet apart running between posts with strips of colored surveyor's flagging tied securely to the string at intervals of no greater than 3 feet.

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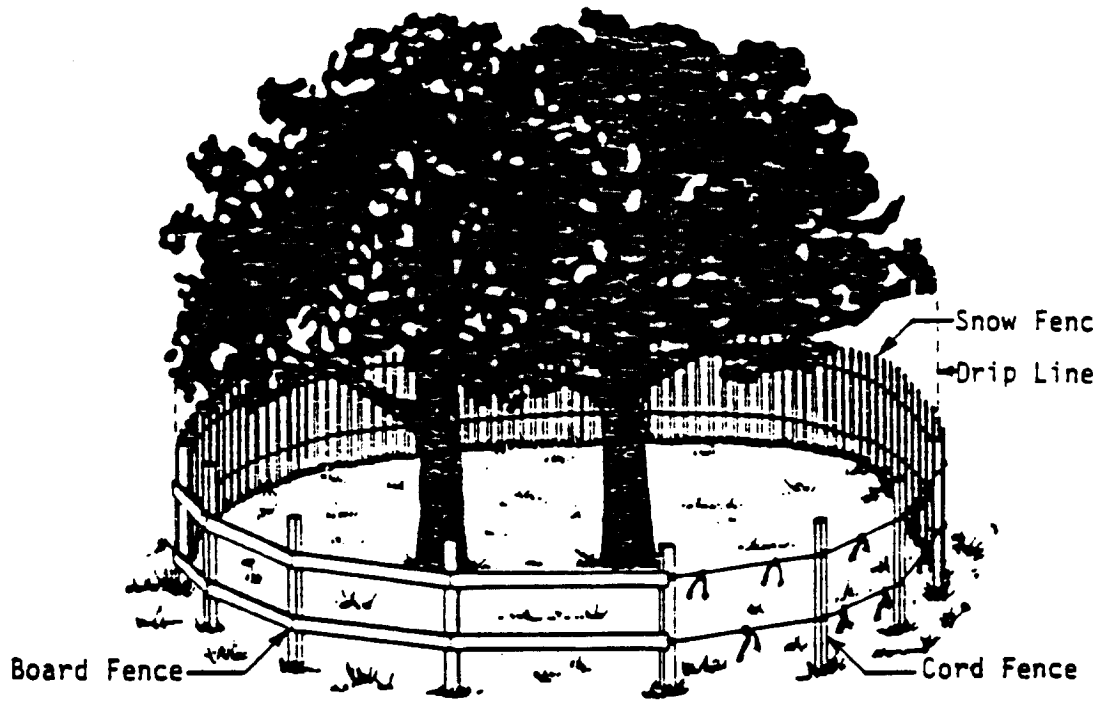
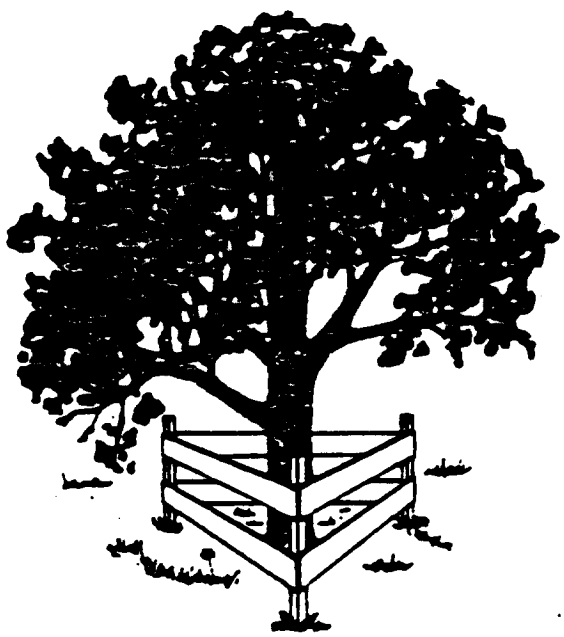
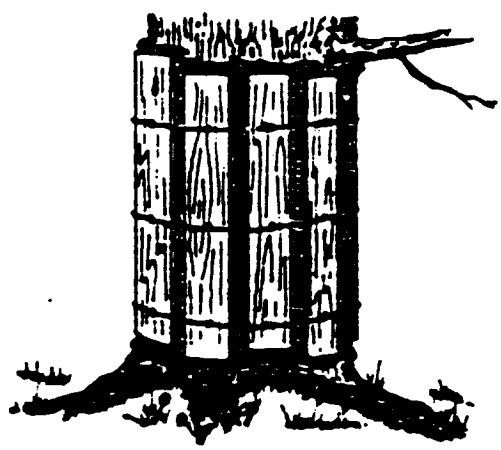


Correct Methods of Tree Fencing



Triangular Board Fence



Correct Trunk Armoring

FENCING AND ARMORING

Source: Va SWCC

Plate 1.85b

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d. Earth Berms - Temporary earth berms shall be constructed according to specifications for a TEMPORARY DIVERSION DIKE (ES BMP 1.15) with the base of the berm on the tree side located along the limits of clearing. Earth berms may not be used for this purpose if their presence will conflict with drainage patterns.

e. Additional Trees - Additional trees may be left standing as protection between the trunks of the trees to be retained and the limits of clearing. However, in order for this alternative to be used, the trunks of the trees in the buffer must be no more than 6 feet apart to prevent passage of equipment and material through the buffer. These additional trees shall be reexamined prior to the completion of construction and either given sufficient treatment to insure survival or removed.

f. Trunk Armoring - As a last resort a tree trunk can be armored with burlap wrapping and 2 inch studs wired vertically no more than 2 inches apart to a height of 5 feet encircling the trunk. If this alternative is used, the root zone within the drip line will still require protection. Nothing should ever be nailed to a tree.

Fencing and armoring devices shall be in place before any excavation or grading is begun, shall be kept in good repair for the duration of construction activities, and shall be the last items removed during the final cleanup after the completion of the project.

9. Raising the Grade: When the ground level must be raised around an existing tree or tree group, the following considerations shall be made and steps taken to adequately care for the affected tree.

a. A well may be created around the tree(s) slightly beyond the drip line to retain the natural soil in the area of the feeder roots (Plate 1.85c).

b. In the case of an individual tree, when the above alternative is not practical or desirable, the following method is recommended to insure survival of the tree (plate 1.85d).

(1) Before making the fill, remove the greeen vegetation, sod, leaf litter and other organic matter from beneath the tree or trees to a distance of 3 feet beyond the drip line, and loosen the surface soil to a depth of approximately 3 inches without damaging the roots.

(2) Apply fertilizer in the root area of the tree to be retained. Fertilizer formulations and application rates and methods shall conform to the guidelines provided in Table 1.85a.

(3) The dry well shall be constructed so as to allow for tree trunk diameter growth. A space of at least 1 foot between the tree trunk and the well wall is adequate for large, old, slow growing trees. Clearance for younger trees shall be at least 2 feet.

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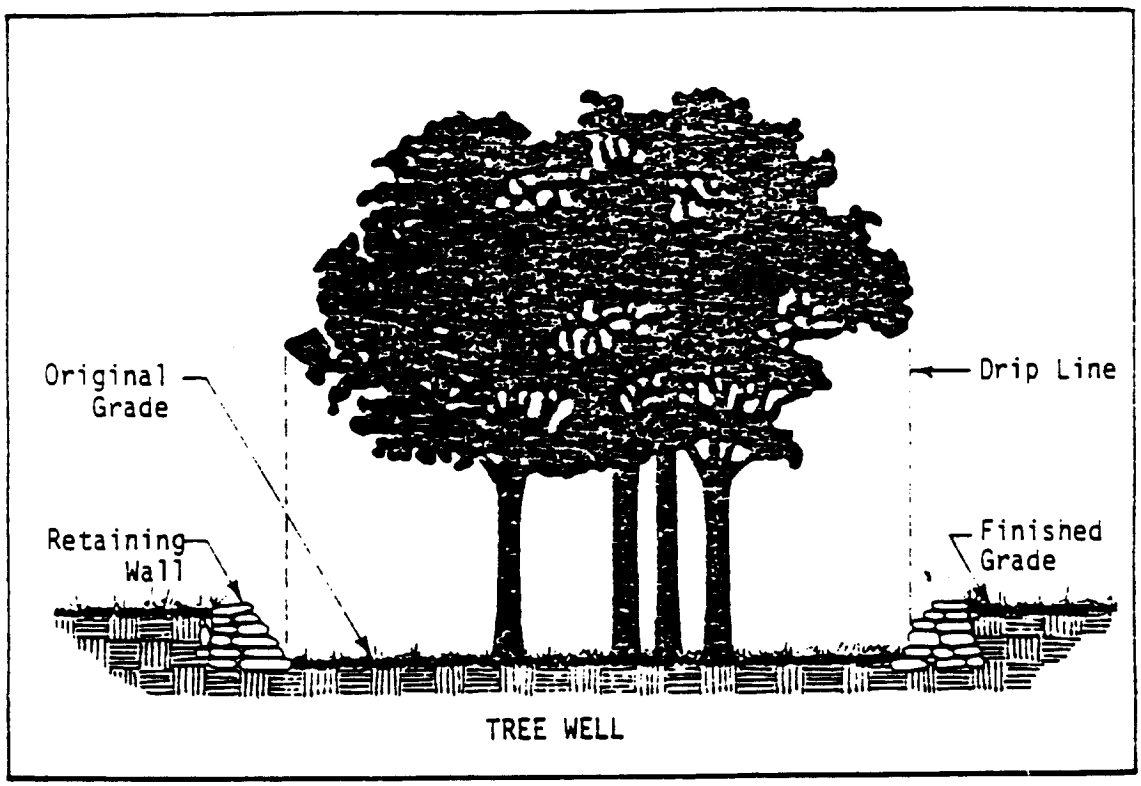


TREE WELL

Source: Va SWCC

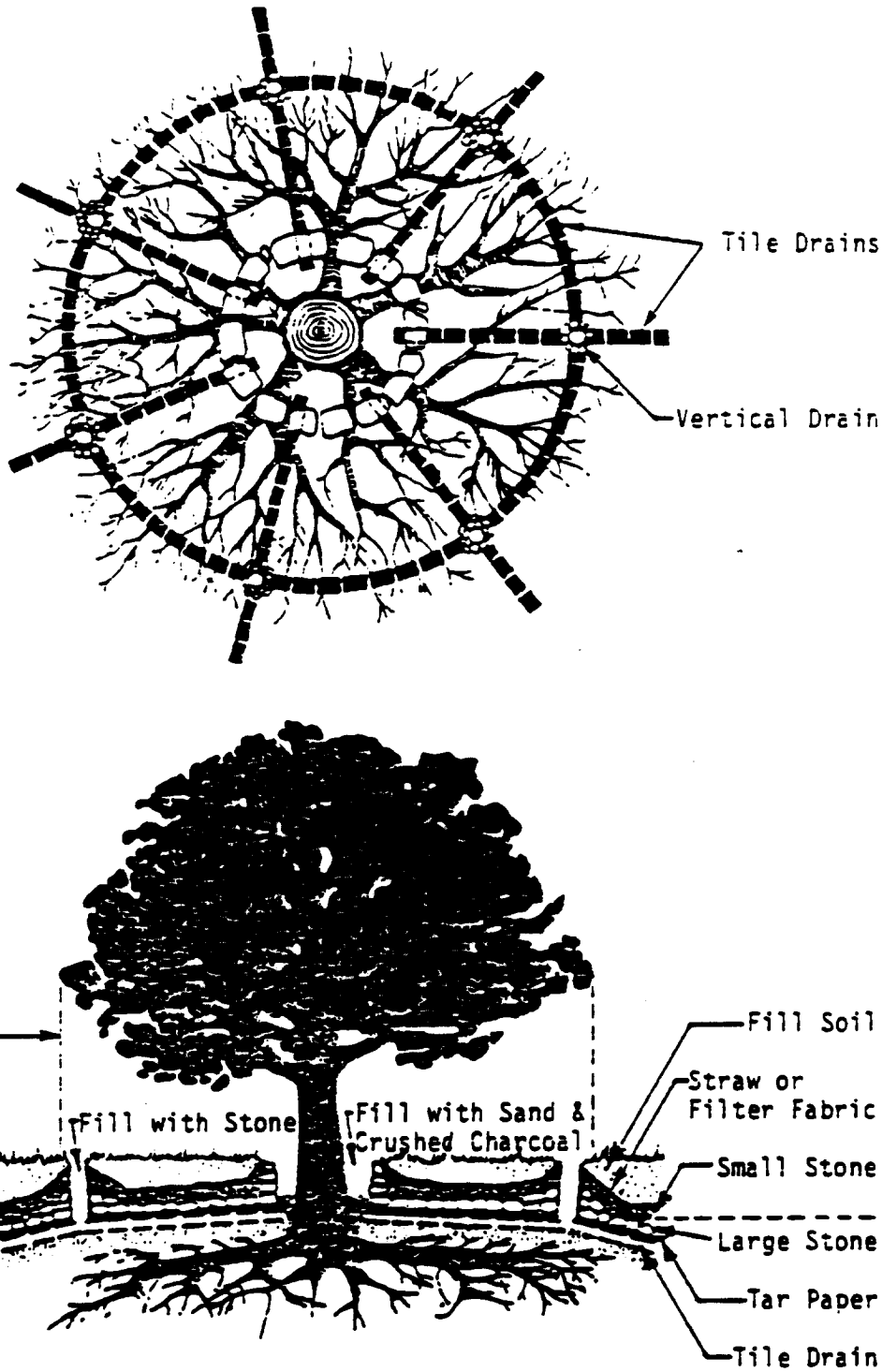
Plate 1.85c

(4) the well should be high enough to bring the top above the level of the proposed fill. The well wall shall taper slightly away from the tree trunk at a rate of 1 inch per foot of wall height.

(5) The well wall shall be constructed of large stones, brick, building tile, concrete blocks or cinder blocks with care being taken to insure that ample openings are left through the wall of the well to allow for free movement of air and water. Mortar shall only be used near the top of the well and only above the porous fill.

(6) Drain lines composed of 4-inch high quality drain tiles shall begin at the lowest point inside the well and extend outward from the tree trunk in a wheel-and-spoke pattern with the trunk as the hub. These radial drain lines shall slope away from the well at a rate of 1/8 inch per foot. The circumferential line to tiles should be located beneath the drip line of the tree. Vertical tiles or pipes shall be placed over the intersections of the two tile systems if fill of more than 2 feet is contemplated. These vertical tiles shall be held in place with stone fill. Tile joints shall be tight. A few radial tiles shall extend beyond each intersection and shall slope sharply downward to insure good drainage.

R0071581



TREE WELL DETAIL

Source: Adapted from Tree Maintenance, 5th ed., Pirone, 1978

Plate 1.85d

R0071582

Table 1.85a

TREE FERTILIZATION FOR PROTECTION FROM CONSTRUCTION ACTIVITY

TREE TYPE	SPECIAL CONDITIONS	APPLICATION RATE & METHOD		FORMULATION
Broad-Leaf Deciduous	Greater than 6 inches dbh* except American Beeches and Crabapples	Normal	2-4 lbs. per in. dbh; Broadcast	Commercial 10-8-6 or 10-6-4
		Grade Change	4-5 lbs. per in. dbh; Broadcast	Commercial 10-6-4
	Smaller than 6 inches dbh including all American Beeches and Crabapple	Normal	1-2 lbs. per in. dbh; Broadcast	Commercial 10-8-6 or 10-6-4
		Grade Change	2-3 lbs. per in. dbh; Broadcast	Commercial 10-6-4
Narrow-Leaf Evergreen	Greater than 6 inches dbh located in groups		2-4 lbs. per 100 sq.ft. of bed area; Broadcast	Commercial 10-6-4
	Greater than 6 inches dbh, single specimens in open areas		2 lbs. per in. dbh; Broadcast	Commercial 10-6-4
	Smaller than 6 inches dbh		5 lbs. per 100 sq.ft. of bed area; Incorporated into soil	Tankage or Cotton-seed Meal
Broad-Leaf Evergreen	Where nitrogen in soil is sufficient		Liberal quantities incor-porated into soil and applied as mulch	Acid Peat Moss or Rotted Oak Leaf Mold
	Where additional nitrogen is necessary		Also add 5 lbs. per 100 sq.ft. of bed area incor-porated into soil	Tankage or Cotton-seed Meal

*dbh: Diameter at breast height (4.5 feet above ground level)

Source: Information taken from Tree Maintenance, P. P. Pirone, 1978.

R0071583

(7) Tar paper or its approved equivalent shall be placed over the tile and/or pipe joints to prevent clogging, and large stones shall be placed around and over drain tiles and/or pipes for protection.

(8) A layer of 2 to 6 inches of stone shall be placed over the entire area under the tree from the well outward at least as far as the drip line. For fills up to 2 feet deep, a layer of stone 8 to 12 inches thick should be adequate. A thicker layer of this stone, not to exceed 30 inches, will be needed for deeper fills.

(9) A layer of 3/4-inch to 1-inch stone covered by straw, fiberglass mat or a manufactured filter fabric shall be used to prevent soil from clogging the space between stones. Cinders shall not be used as fill material.

(10) Filling shall be completed with porous soil such as topsoil until the desired grade is reached. This soil shall be suitable to sustain specified vegetation.

(11) To prevent clogging of the drain lines, crushed stone shall be placed inside the dry well over the openings of the radial tiles. Vertical tiles shall also be filled with crushed rock and may also be covered with a screen.

(12) To prevent anyone from falling into the dry well, and leaves and debris from accumulating there, the area between the trunk and the well wall shall either be covered by an iron grate or filled with a 50-50 mixture of crushed charcoal and sand. (This will also prevent rodent infestation and mosquito breeding.)

c. Where water drainage through the soil is not a problem, coarse gravel in the fill may be substituted for the tile. This material has sufficient porosity to ensure air drainage. Instead of the vertical tiles or pipes in the system, stones, crushed rock and gravel may be added so that the upper level of these porous materials slants toward the surface in the vicinity below the drip line (Plate 1.85e).

d. Raising the grade on only one side of a tree or group of trees may be accomplished by constructing only half of one of these systems.

10. Lowering the Grade: Trees shall be protected from harmful cuts by the construction of a tree wall (Plate 1.85f).

a. Following excavation, all tree roots that are exposed and/or damaged shall be trimmed cleanly, painted with tree paint, and covered with moist peat moss, burlap or other suitable material to keep them from drying out.

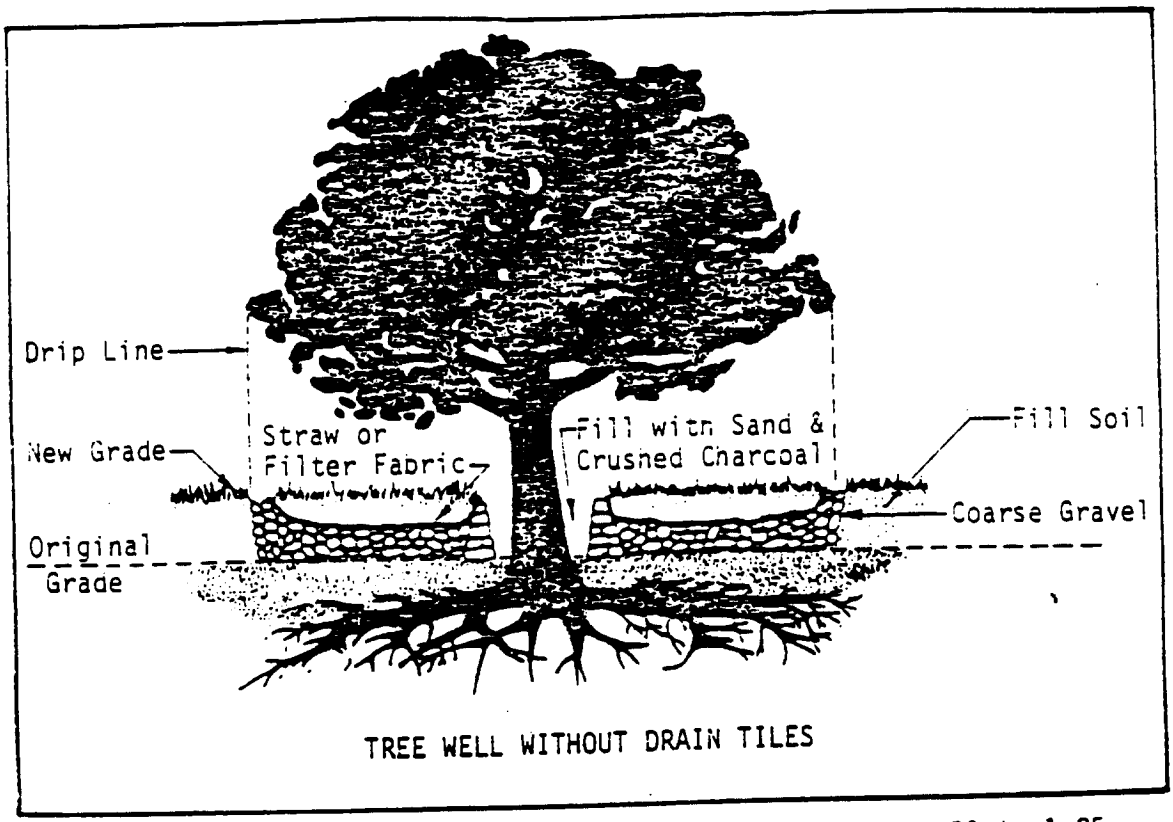


Plate 1.85e

Source: Va SWCC

b. The wall shall be constructed of large stones, brick, building tile, or concrete block or cinder block in accordance with the detail in Plate 1.85f.

c. Backfill with peat moss or other organic material or with topsoil to retain moisture and aid in root development.

d. Apply fertilizer and water thoroughly. Fertilizer formulations and application rates and methods shall conform to the guidelines provided in Table 1.85a.

e. Prune the tree crown, reducing the leaf surface in proportion to the amount of the root loss.

f. Provide drainage through the wall so water will not accumulate behind the wall.

g. Lowering the grade on only one side of a tree or group of trees may be accomplished by constructing only half of this system.

11. <u>Trenching and Tunnelling</u>:

a. Trenching shall be done as far away from the trunks of trees as possible, preferably outside the branches or crown spreads of trees, to reduce the amount of root area damaged, or killed by trenching activities.

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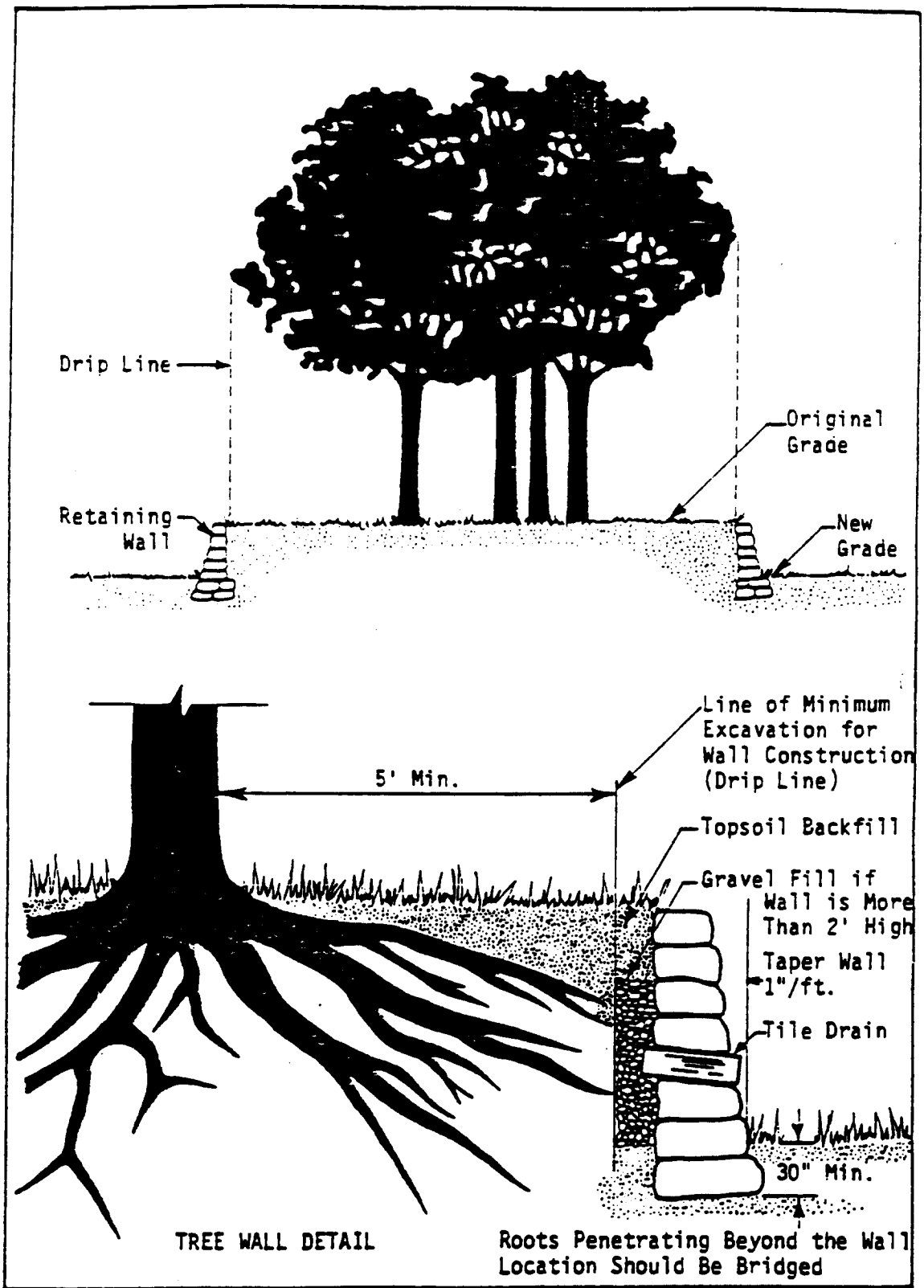

Source: Adapted from Public Facilities Manual, Vol. III, Plate 1.85f Fairfax County, Va., 1976, and Trees for Architecture and the Landscape, Zion, 1968

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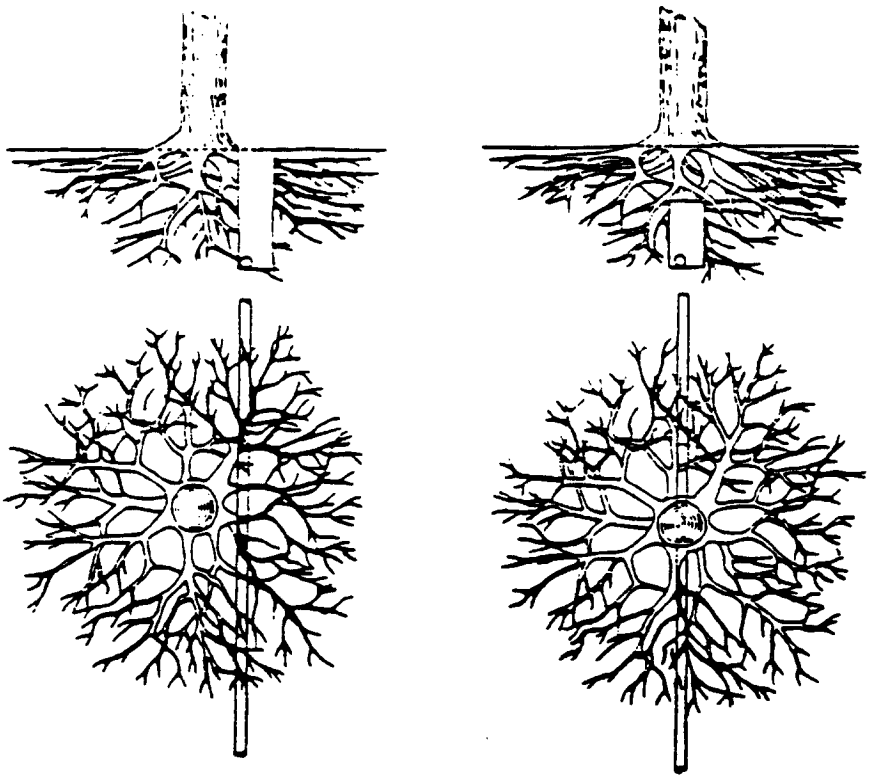

Destruction of Feeder Roots
Will Probably Kill the Tree

Tunneling Under the Tree Will
Preserve Important Feeder Roots

TRENCHING vs TUNNELING

Source: Tree Maintenance, Pirone, 1979 Plate 1.85g

b. Wherever possible, trenches should avoid large roots or root concentrations. This can be accomplished by curving the trench or by tunnelling under large roots and areas of heavy root concentration.

c. Tunnelling under an individual specimen that does not have a large taproot may be preferable to trenching beside it. Tunnelling is more expensive initially, but it usually causes less soil dis- turbance and physiological impact on the root system (Plate 1.85g). The extra cost may offset the potential costs of tree removal and replacement should the tree die.

d. Roots shall not be left exposed to the air. They shall be covered with soil as soon as possible or protected and kept moistened with wet burlap or peat moss until the trench or tunnel can be filled.

R0071587

e. The ends of damaged and cut roots shall be cut off smoothly and protected by painting promptly with a tree wound dressing.

f. Trenches and tunnels shall be filled as soon as possible. Air spaces in the soil shall be avoided by careful filling and tamping.

g. Peat moss or other suitable material shall be added to the fill material as an aid to inducing and developing new root growth.

h. The tree shall be mulched and fertilized to conserve moisture, stimulate new root growth and enhance general tree vigor.

i. If a large amount of the root system has been damaged and killed, the crown leaf surface shall be proportionately reduced to balance the reduced root system. This may be accomplished by pruning 20 to 30 percent of the crown foliage. If roots are cut during the winter, pruning shall be accomplished before the next growing season. If roots are cut during the growing season, pruning shall be done immediately.

12. Removal and Replacement of Damaged Trees: Should a tree intended and marked to be retained be damaged seriously enough that survival and normal growth are not possible, the tree shall be removed. If replacement is desirable and/or required, the replacement tree shall be of the same or similar species, 2-inch to 2 1/2-inch caliper balled and burlapped nursery stock.

13. Cleanup: Cleanup after a construction project can be a critical time for tree damage. Trees protected throughout the development operation are often destroyed by carelessness during the final cleanup and landscaping. Fences and barriers shall be removed last, after everything else is cleaned up and carried away.

14. Maintenance: In spite of precautions, some damage to protected trees may occur. In such cases, the following maintenance guidelines should be followed.

a. Soil Aeration - If the soil has become compacted over the root zone of any tree, the ground ball shall be aerated by punching holes with an iron bar. The bar shall be driven 1-foot deep and then moved back and forth until the soil is loosened. This procedure shall be repeated every 18 inches until all of the compacted soil beneath the crown of the tree has been loosened.

b. Repair of Damage

(1) Any damage to the crown, trunk or root system of any tree retained on the site shall be repaired immediately.

(2) Whenever major root damage or bark damage occurs, remove some foliage to reduce the demand for water and nutrients.

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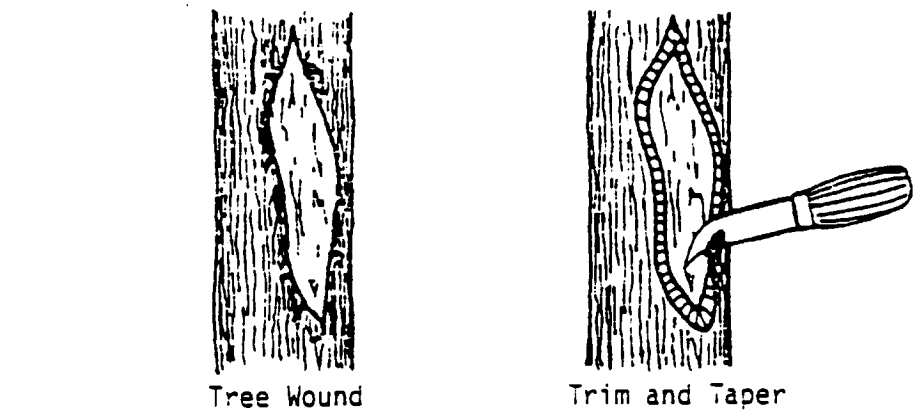
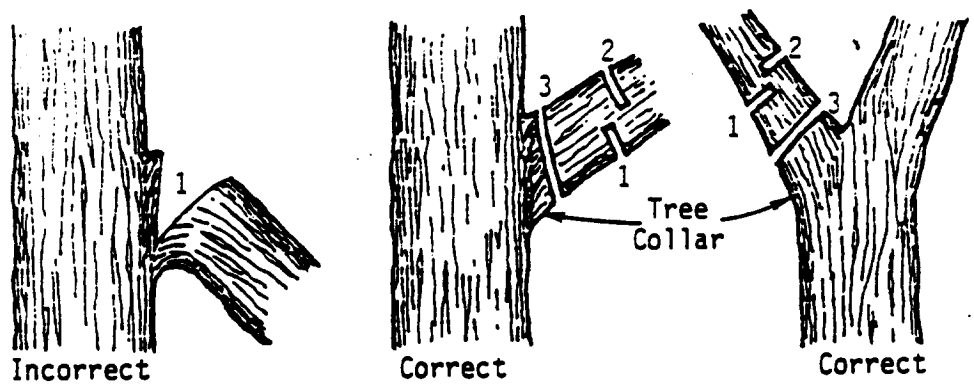


TREATING BARK WOUNDS



PRUNING DAMAGED BRANCHES

Source: Public Facilities Manual, Vol. III
Fairfax County, Virginia 1976

Plate 1.85h

(3) Damaged roots shall immediately be cut off cleanly inside the exposed or damaged area. Cut surfaces shall be painted with approved tree paint, and moist peat moss, burlap or topsoil shall be spread over the exposed area.

(4) To treat bark damage, carefully cut away all loosened bark back into the undamaged area, taper the cut at the top and bottom and provide drainage at the base of the wound (Plate 1.85h).

(5) All tree limbs damaged during construction or removed for any reason shall be cut off above the collar at the preceding branch junction (Plate 1.85h).

(6) Care for serious injuries shall be prescribed by a forester or a tree specialist.

c. Fertilization: Broadleaf trees that have been stressed or damaged shall receive a heavy application of fertilizer to aid their recovery.

(1) Trees shall be fertilized in the late fall (after October 1) or the early spring (from the time frost is out of the ground until May 1). Fall applications are preferred, as the nutrients will be made available over a longer period of time.

(2) Fertilizer shall be applied to the soil over the feeder roots. (See Plate 1.85i). In no case should it be applied closer than 3 feet to the trunk.

The root system of conifers extends some distance beyond the drip line. Increase the area to be fertilized by 1/4 the area of the crown.

(3) Fertilizer shall be applied using approved fertilization methods and equipment.

(4) Formulations and application rates shall conform to the guidelines given in Table 1.85a.

Maintain a ground cover or organic mulch layer around trees that is adequate to prevent erosion, protect roots, and hold water.

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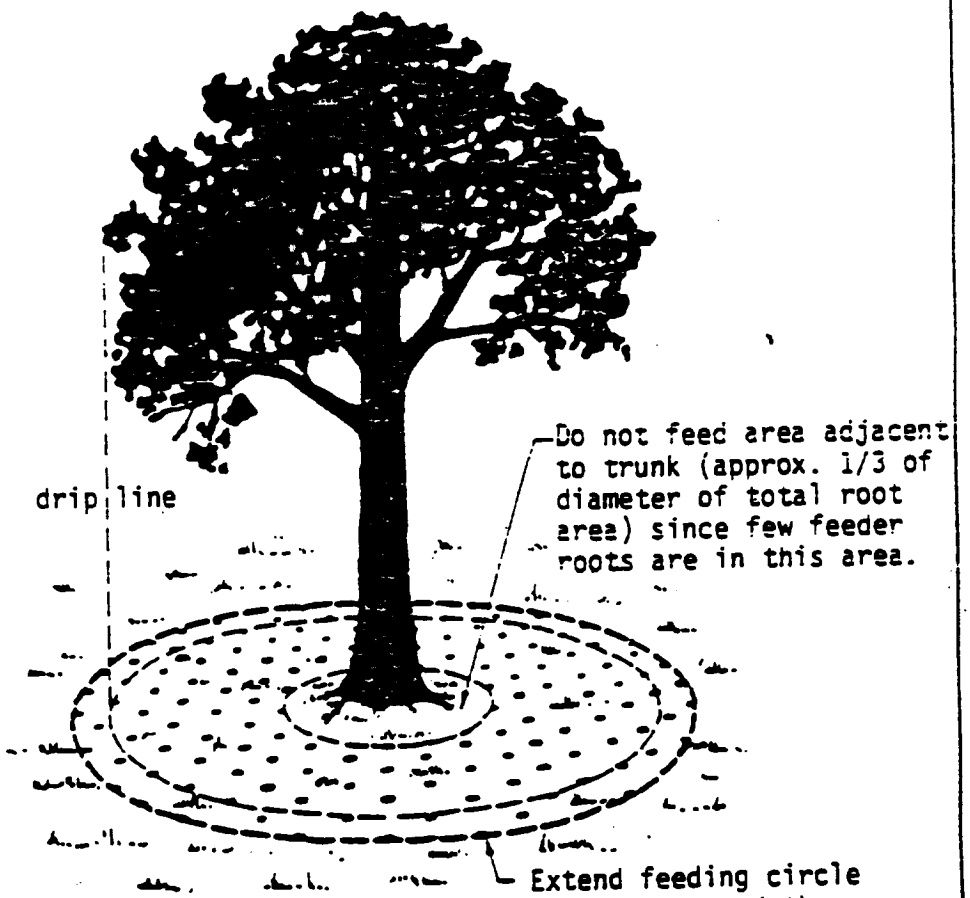
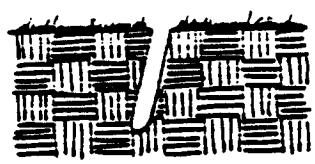
TREE FERTILIZATION





Holes should be approximately 18" deep and 2' apart, and they should slant toward the trunk.

Source: Tree Maintenance, Pirone

Plate 1.85i

R0071591

ES BMP 1.86

DUST CONTROL

Definition

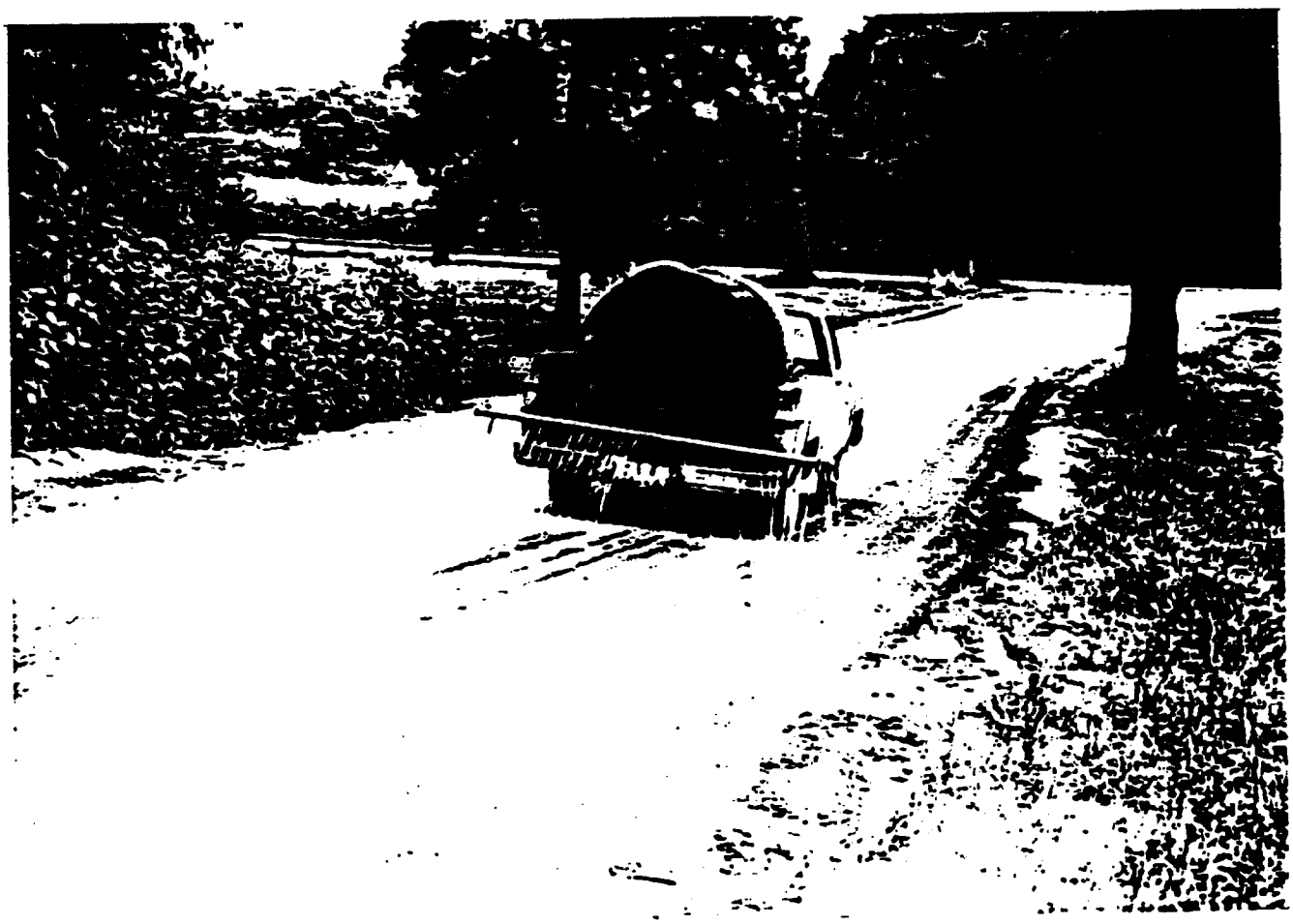
Reducing surface and air movement of dust during land disturbing, demolition and construction activities.

Purpose

To prevent surface and air movement of dust from exposed soil surfaces and reduce the presence of airborne substances which may be harmful or injurious to human health, welfare, or safety, or to animal or plant life.

Conditions Where Practice Applies

In areas subject to surface and air movement of dust where on-site and off-site damage is likely to occur if preventive measures are not taken.



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Planning Considerations

Construction activities inevitably result in the exposure and disturbance of soil. Fugitive dust is emitted both during the activities (i.e., excavation, demolition, vehicle traffic, human activity) and as a result of wind erosion over the exposed earth surfaces. Large quantities of dust are typically generated in "heavy" construction activities, such as road and street construction and subdivision, commercial and industrial development, which involve disturbance of significant areas of soil surface. Research at construction sites has established an average dust emission rate of 1.2 tons/acre/month for active construction. Earth-moving activities comprise the major source of construction dust emissions, but traffic and general disturbance of the soil also generate significant dust emissions.

In planning for dust control, it should be obvious that the less soil is exposed at any one time, the less potential there will be for dust generation. Therefore, phasing a project and utilizing temporary stabilization practices upon the completion of grading can significantly reduce dust emissions.

Temporary Measures

1. Mulches - See MULCHING, ES BMP 1.75. Synthethic resins may be used instead of asphalt to bind mulch material. Resins such as Curasol or Terratack should be used according to manfacturer's recommendations.

2. Vegetative Cover - See TEMPORARY SEEDING, ES BMP 1.65.

3. Spray-on Adhesives - (Table 1.86a) - These are used on mineral soils (not effective on muck soils). Keep traffic off these areas.

Table 1.86a

SPRAY-ON ADHESIVE SPECIFICATIONS

Adhesive	Water Dilution	Type of Nozzle	Application Rate (Gallons/Ac.
Anionic Asphalt emulsion	7:1	Coarse Spray	1,200
Latex emulsion	12-1/2:1	Fine Spray	235
Resin-in-water emulsion	4:1	Fine Spray	300

4. Tillage - This practice is designed to roughen and bring clods to the surface. It is an emergency measure which should be used before wind erosion starts. Begin plowing on windward side of site. Chisel-type plows (with 12-inch spacings), spring-toothed harrows, and similar plows are examples of equipment which may produce the desired effect.

5. Irrigation - This is generally done as an emergency treatment. Site is sprinkled with water until the surface is wet. Repeat as needed.

To prevent carryout of mud onto streets, refer to TEMPORARY GRAVEL CONSTRUCTION ENTRANCE, ES BMP 1.01.

6. Barriers - Solid board fences, burlap fences, crate walls, bales of hay and similar material can be used to control air currents and soil blowing. Barriers placed at right angles to prevailing currents at intervals of about 15 times the barrier heignt are effective in controlling wind erosion.

7. Calcium Chloride - Apply at rate that will keep surface moist. May need retreatment.

Permanent Methods

8. Permanent Vegetation - See standards for permanent seeding, and permanent stabilization with sod. Existing trees and large shrubs may afford valuable protection if left in place.

9. Topsoiling - This entails covering the surface with less erosive soil material. See TOPSOILING, ES BMP 1.61.

10. Stone - Cover surface with crushed stone or coarse gravel.

APPENDIX 6-1

Example Design of a Multi-Purpose
Detention/Filtration Facility

R0071595

Multiple Purpose Detention/Filtration Facilities for Water Quantity and Water Quality Management

Introduction:

Engineers and other designers of stormwater maangement systems may often be confronted with developing installations for purposes which require different design strategies. In Florida this often involves satisfying the provisions of local or regional flood control ordinances, as well as statewide stormwater pollution control regulations. The design criteria for these purposes depends upon the level of flood protection desired by the community and the amount of pollutant removal mandated to protect water quality.

Usually, a locality will specify that stormwater runoff from a developing drainage area must be stored and released so that the post-development peak runoff rate does not exceed the predevelopment rate for a specific design storm. The detained water is discharged without any additional treatment. The release time normally varies between a few hours to no more than one day. In some localities a 10-year design storm is specified to protect downstream drainage structures. Other localities require protection from larger storms and specify that a 50-year or 100-year storm must be detained and released at a reduced rate. There are even criteria in existence which require that the peak rate of runoff from all storms must not be increased by development.

The primary design strategy for pollution control purposes is associated with the capture of the first portion of runoff (i.e., the initial 1/2 inch of runoff or the runoff from the first inch of rainfall). This water and equivalent amounts from larger storms are either percolated through the soil or filtered through suitable material and released to surface waters. In this manner pollutant removal is increased over conventional detention facilities.

To maximize the cost benefit of an impoundment, multiple-purpose design strategies should be explored. By incorporating different treatment mechanisms at various stages (storage elevations), a number of desired purposes may be achieved within the same installation.

For example, an impoundment can be designed with an outlet structure such that the first stage will capture an initial volume of runoff (i.e., 0.5 inch). Subsequently, this water may be slowly released through a subsurface drain or filtration system. Preliminary studies conducted at the University of Central Florida indicate that 80 to 90 percent of the annual average pollutant load should be removed. The second stage begins with a weir or other type orifice which has the capacity to pass stormwater at a pre-development rate when the water elevation reaches the crest of the structure. Such facilities are usually designed to limit the discharge expected from rainfall events of up to and including the 10-year or 25-year storm thus providing for flood control downstream.

In practice, the location, size, and shape of stormwater storage areas and, consequently; the configuration (layout), depth, and length of the underdrain

or filter system is often determined by site conditions or the desires of the developer. Moreover, many engineers prefer to use what is referred to as trial and error type design procedures. In both instances, many of the physical dimensions of the facility are predetermined and the task of the designer involves doing an assessment of various factors to determine if the structure satisfies both flood control and stormwater quality regulations.

The following example illustrates a series of steps which outline how such a facility may be designed, and checked for compliance with local and statewide regulations. In this instance the project represents an actual plan submitted to the department. The site may be considered typical of many low lying, flat, relatively poorly drained areas which are very common, particularly in the coastal regions of Florida. The soil may be described as sandy, but percolation and drainage is restricted due to a fine textured subsoil layer about 6 feet below the surface. The topography is relatively flat. At the time of application the watershed area was classed as unimproved or open land, but was wooded. The developer planned to convert 4.5 acres to an apartment complex.

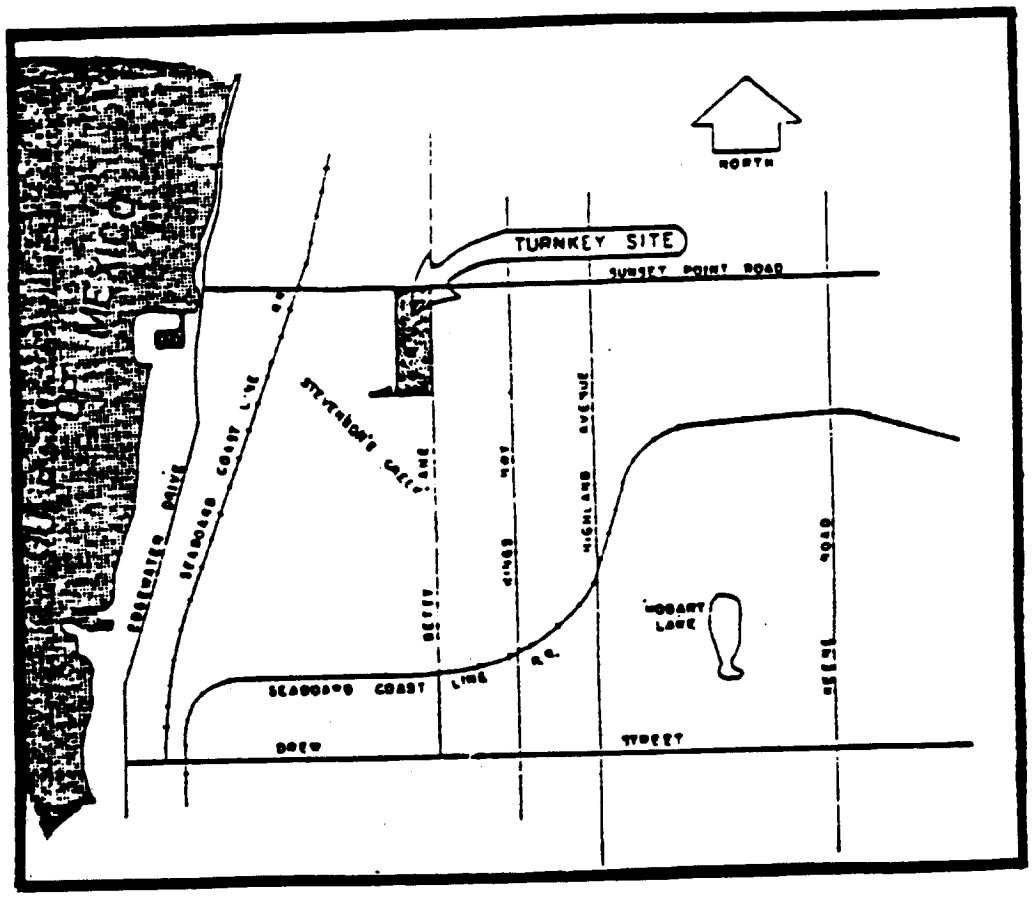
Local regulations mandated that the 25 year return frequency storm be used for design purposes to control off site flooding. A detention pond was specified to regulate the increased stormwater discharge expected. The storage area was also planned to serve other purposes including water quality improvement and as open space or a green area for enhanced aesthetics. The facility was scheduled to be fully sodded and provided with underdrain for treatment of the first one-half inch of stormwater runoff to satisfy state water quality concerns. The physical dimensions of the facilities, the drainage area size, the points of discharge into waters of the state, and the hydraulic computations are noted below and are illustrated in Figure 1 and 2. In this example the designer first calculated offsite drainage in order to determine the stage in the receiving stream. Such information is important to insure that the function of the facility will not be affected by water level elevations at the outlet of the structure.

Example Design Procedure for Multiple Purpose Underdrain/Dry Dentention Filtration Facility:

I. Estimate Water Level Elevation in Receiving Stream for the Appropriate Design Storm

Determine the flow or rate of discharge expected:

A. As noted earlier, the degree of flood protection mandated by various municipalities and/or water management districts may vary quite widely. However, it is not uncommon to find a requirement which specifies that the stormwater management system must detain the excess flow from a storm of such magnitude that it would be expected (based on statistical analysis of rainfall data) to occur on an average of once in twenty-five years. It is usually assumed that the flood stage estimated from this hypothetical storm will occur with a similar degree of frequency.



VICINITY MAP

Figure 1

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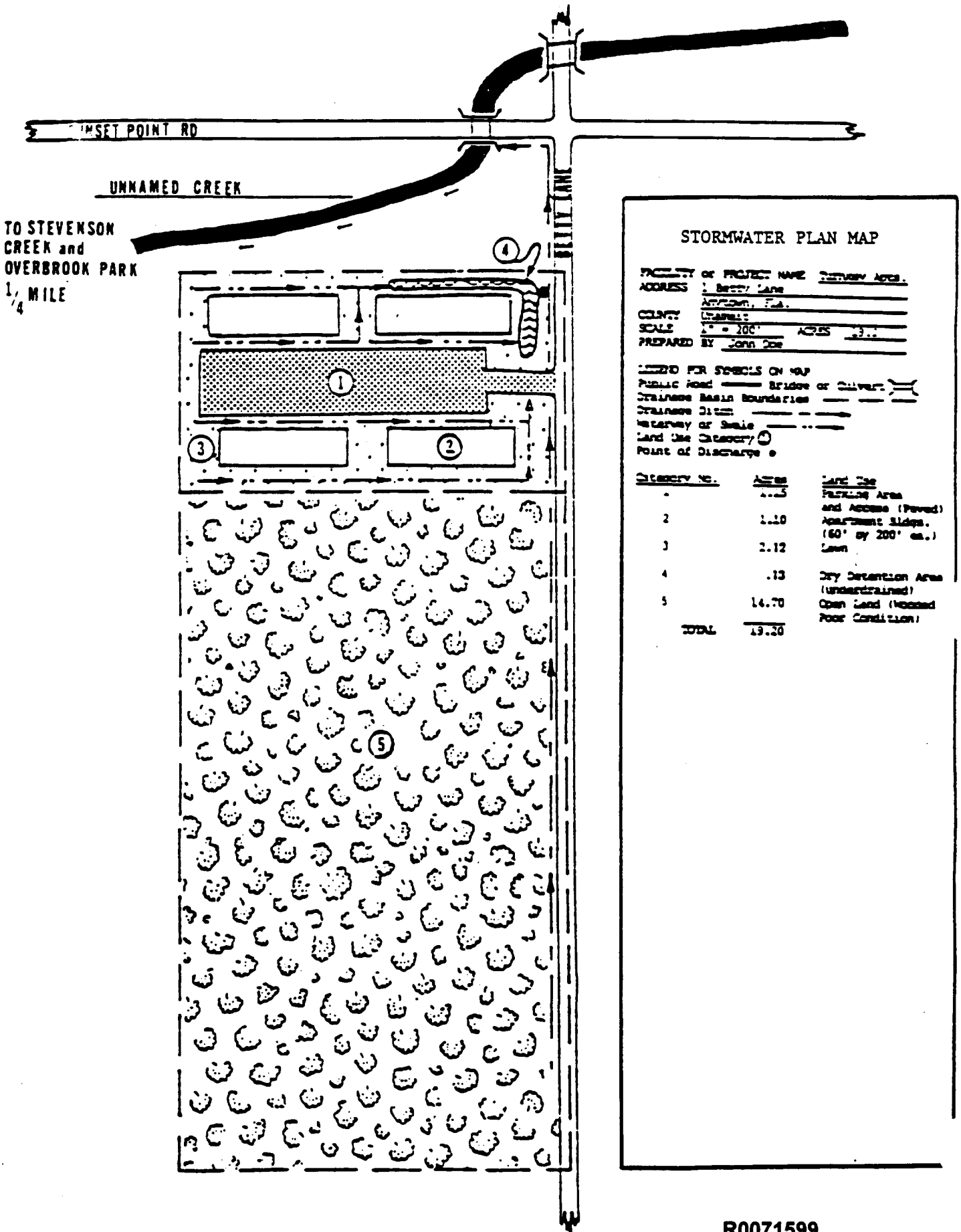
Figure 2



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In reality, the highest stage in any particular body of water which can be expected on an average of once in 25 year, is not likely to be equal to that calculated based on the flow projected from a design storm with the same reoccurance interval or return frequency. Therefore, flood flow or discharge should be determined from a frequency analysis of streamflow data if available.

Since discharge information is only collected at a limited number of locations an applicant is likely to find that flow records do not exist which can be extrapolated to a particular site. In this instance, discharges estimated using procedures developed by the Soil Conservation Service; the Rational Runoff Formula for smaller watersheds; and, other commonly accepted methods can be used to provide a reasonable estimate of peak discharge rates.

For this project it was appropriate for the engineer to choose to calculate off-site peak runoff to the receiving stream (drainage ditch) using the Rational Formula due to the small size of the watershed.

The Rational Formula is written as follows:

[Q = CIA]

where; Q = flow in cfs.

C = the rational runoff coeficient (usually selected at the discretion of the designer. Values for various land use classes are listed in Table - 1)

I = average rainfall intensity in inches/hour for the appropriate design storm (i.e., 25 yr. return frequency in this case). The maximum peak producing rainfall event is assumed to be equivalent to a storm with a duration equal to the time of concentration (TC) when using the Rational Method.

A = watershed area in acres.

Working through the various factors in the equation for this example;
Off-site area (A) = 14.7 acres (1061 ft. X 603 ft. see Figure 2)
(C) = 0.25 (Open Land "Unimproved", Table 1)

However, the (Tc) or time of concentration must be estimated prior to the selection of the appropriate value for the average rainfall intensity (I). In this example two types of flow conditions exist from the furthermost point in the watershed to the point of concern (i.e., the discharge point of the detention/underdrain facility). To compute the travel time or (Tc) for runoff water moving over this distance the designer must first calculate the time needed for overland flow across approximately 600 ft. Subsequently, the time of open channel flow through approximately 1400 ft. of drainage ditch to the point of concern must also be determined. The time required for runoff to negotiate both reaches will equal (Tc).

The travel time through each component is computed by dividing the length of flow by the average velocity. If the slope and land use of the overland flow segment are known, the average flow velocity can be read from a graph such as the one illustrated in Figure 3 provided through the Florida Department of Transportation (FDOT) Drainage Manual, Chapter 6.

R0071600

Table 1

Runoff Coefficients[a,b]

Description of Area	Runoff Coefficients	Character of Surface	Runoff Coefficients
Business		Pavement	
Downtown	0.70 to 0.95	Asphalt or concrete	0.70 to 0.95
Neighborhood	0.50 to 0.70	Brick	0.70 to 0.85
Residential		Roofs	0.70 to 0.95
Single Family	0.30 to 0.50	Lawns, Sandy Soil	
Multiunits, detached	0.40 to 0.60	Flat, 0-2%	0.05 to 0.10
Multiunits, attached	0.60 to 0.75	Average, 2-7%	0.10 to 0.15
Residential, suburban	0.25 to 0.40	Steep, 7% or more	0.15 to 0.20
Apartment	0.50 to 0.70	Lawns, Heavy Soil	
Industrial		Flat, 2%	0.13 to 0.17
Light	0.50 to 0.80	Average, 2-7%	0.18 to 0.22
Heavy	0.60 to 0.90	Steep, 7% or more	0.25 to 0.35
Parks, Cemeteries	0.10 to 0.25		
Railroad Yard	0.20 to 0.35		
Unimproved	0.10 to 0.30		

[a]The coefficients in these two tabulations are only applicable for storms to 5 to 10 year return frequencies and were originally developed when many streets were uncurbed and drainage was conveyed in roadside swales.

For recurrence intervals longer than 10 years, the indicated runoff coefficients should ' increased, assuming that nearly all of the rainfall in excess of that expected from the . year recurrence interval rainfall will become runoff and should be accommodated by an increased runoff coefficient.

The runoff coefficients indicated for different soil conditions reflect runoff behavior shortly after initial construction. With the passage of time, the runoff behavior of sandy soil areas will tend to approach that of heavy soil areas. If the designer's interest is long term, the reduced response indicated for sandy soil areas should be disregarded.

[b]From Design and Construction of Sanitary and Storm Sewers. ACSE Manual of Practice No. 37, 1970. Revised by D. Earl Jones, Jr.

Wanielista M.P. etal 1981
Reference: "Stormwater Management Manual"

R0071601

In this example, the slope was measured in the field. The average elevation changed about four (4) feet over the six hundred (600) foot flow distance.

$$\text{Average Slope (\%)} = \frac{4 \text{ ft}}{600 \text{ ft}} \times 100 = 0.67\%$$

The land use is noted in Figure 2. The area is wooded, but the stand is in poor condition. The project is surrounded by other urban areas and drainage has been improved. Therefore, the site is expected to have less capacity to store runoff than other more natural woodlands.

Using the average slope the designer may enter Figure 3 and find the correct gradient (i.e. .67%) along the bottom of the page. Moving vertically to the curve for the correct land use (i.e. wooded low storage), the average velocity may be read from the vertical scale or axis recorded along the left of the graph.

Average Velocity = 28 ft./min.

The travel time associated with the overland flow segment is equal to:

$$\frac{\text{Length of Travel (600 ft.)}}{\text{Average Velocity (28 ft/min)}}$$ therefore;

Travel Time (overland flow) = 21 min.

The next step is to estimate the time it will take for water flowing in the existing drainage ditch to reach the outlet.

The travel time for flow in the open channel can be determined by using Manning's equation.

$$V = \frac{1.49}{n} R^{2/3} S^{1/2}$$

where;

V = Velocity of flow (mean) in feet per second.
n = Coefficient of retardance used in flow formulas. In vegetation-lined channels this coefficient contains not only the effect of lining roughness but also the effect of irregularities in bed surface, channel shape, slope and alinement on the flow. The effect of blocking out a portion of the cross section by vegetation is also included.
R = Hydraulic radius in feet (i.e., the cross-sectional area divided by the wetted perimeter).
S = Slope of energy gradient in feet per foot. In vegetation-lined channels where the flow is considered to be uniform, the bed slope in feet per foot of length may be used. The use of vertical drop and slope length in computing S is satisfactory in most vegetated channels.

Table-2 as well as the "Guide for Selecting Roughness Coefficient "n" Values for Channels" compiled by Guy B. Gasken, Soil Conservation Service, USDA, Lincoln, Nebraska, 1963, and U.S. Geological Survey Water Supply Paper 1849, "Roughness Characteristics of Natural Channels" are useful guides in

R0071602

Figure 3
Average Velocities for Estimating Time of
Travel for Overland Flow

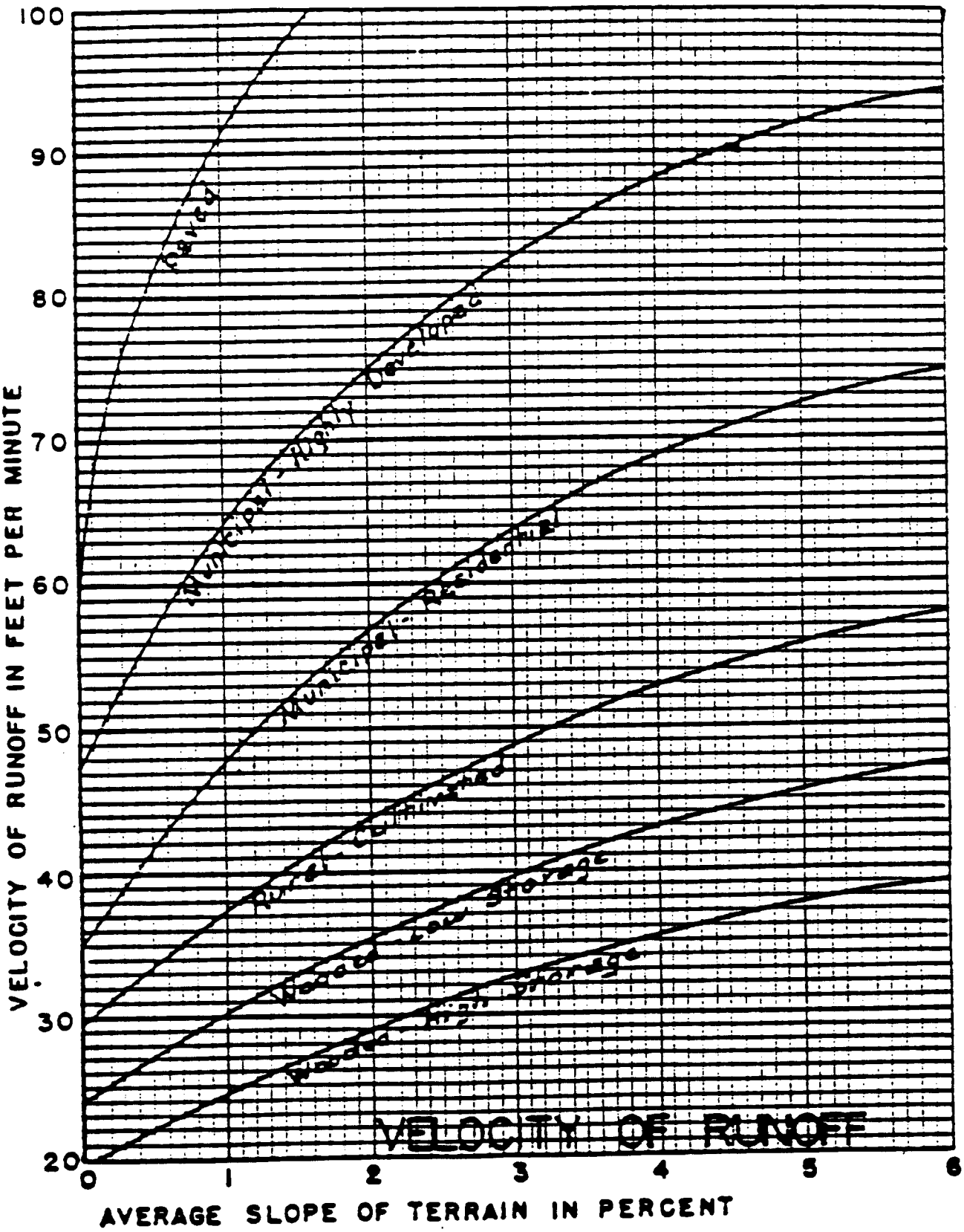

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Table 2

Values of Manning's "n" for Existing Channels

Surface	Best	Good	Fair	Bad
Canals and ditches				
Earth, straight and uniform	0.017	0.020	0.0225*	0.025
Rock cuts, smooth and uniform	0.025	0.030	0.033*	0.035
Rock cuts, jagged and irregular	0.035	0.040	0.045	
Winding sluggish canals	0.0225	0.025*	0.0275	0.030
Dredged earth channels	0.025	0.0275*	0.030	0.033
Canals with rough stony beds, weeds on earth banks	0.025	0.030	0.035*	0.040
Earth bottom, rubble sides	0.028	0.030*	0.033*	0.035
Natural stream channels:				
(1) Clean, straight bank, full stage, no rifts or deep pools	0.025	0.0275	0.030	0.033
(2) Same as (1), but some weeds and stones	0.030	0.033	0.035	0.040
(3) Winding, some pools and shoals, clean	0.033	0.035	0.040	0.045
(4) Same as (3), lower stages, more ineffective slope and sections	0.040	0.045	0.050	0.055
(5) Same as (3), some weeds and stones	0.035	0.040	0.045	0.050
(6) Same as (4), stony sections	0.045	0.050	0.055	0.060
(7) Sluggish river reaches, rather weedy or with very deep ponds	0.050	0.060	0.070	0.080
(8) Very weedy reaches	0.075	0.100	0.125	0.150

*Values commonly used in designing

R0071604

estimating "n" values of existing channels. However, as specified in the equation, information pertaining to channel dimensions and gradient is also needed. This data is normally determined from a field survey. The channel should be divided into reaches of equivalent width, depth, and slope. Constructing a cross sectional drawing illustrating the physical dimensions of each reach is useful to both the engineer and review agency personnel responsible for approving the project. In this example the channel is a constant size and shape throughout. A typical cross section is shown in Figure 4.

Typical of many roadside ditches the side slopes, at 1.1 feet horizontal to 1 foot verticle, are more steep than would normally be recommended for easy maintenance, safety, and/or erosion control (i.e. 3:1 or 4:1). The bottom elevation is 8.0 ft M.S.L. The width of the bottom is approximately 5 feet, and the main channel averages 3 feet deep. The field survey indicates the channel is trapezoidal shaped and rather poorly maintained. As would be expected, the sides and bottom are rough and heavily vegetated with weeds. The grade of the ditch is flat, averaging about .25 feet per 100 feet or .0025 ft/ft.

Based on this information and data from Table 2, a roughness coefficient or "n" value of at least .04 and possibly as high as .06 would be appropriate for the existing channel. use an average value "n" = .050. The slope (S) = .0025 ft/ft was specified earlier. The hydraulic radius (R) for a trapezoidal cross section may be determined by dividing the area of the channel by the wetted perimeter. In this instance (R) was calculated to equal 1.8.

We may now compute the open channel flow travel time. Use Mannings equation to calculate bank full velocity.

$$V = \frac{1.49}{n} \times R^{2/3} S^{1/2}$$

$$V = \frac{1.49}{.05} \times 1.8^{2/3} \times .0025^{1/2}$$

$$V = 29.8 \times 1.48 \times .05$$

$$V = 2.2 \text{ ft/sec}$$

$$\text{Travel Time (open channel)} = \frac{\text{Length}}{\text{Velocity}} = \frac{1400}{2.2} = 636 \text{ sec}$$

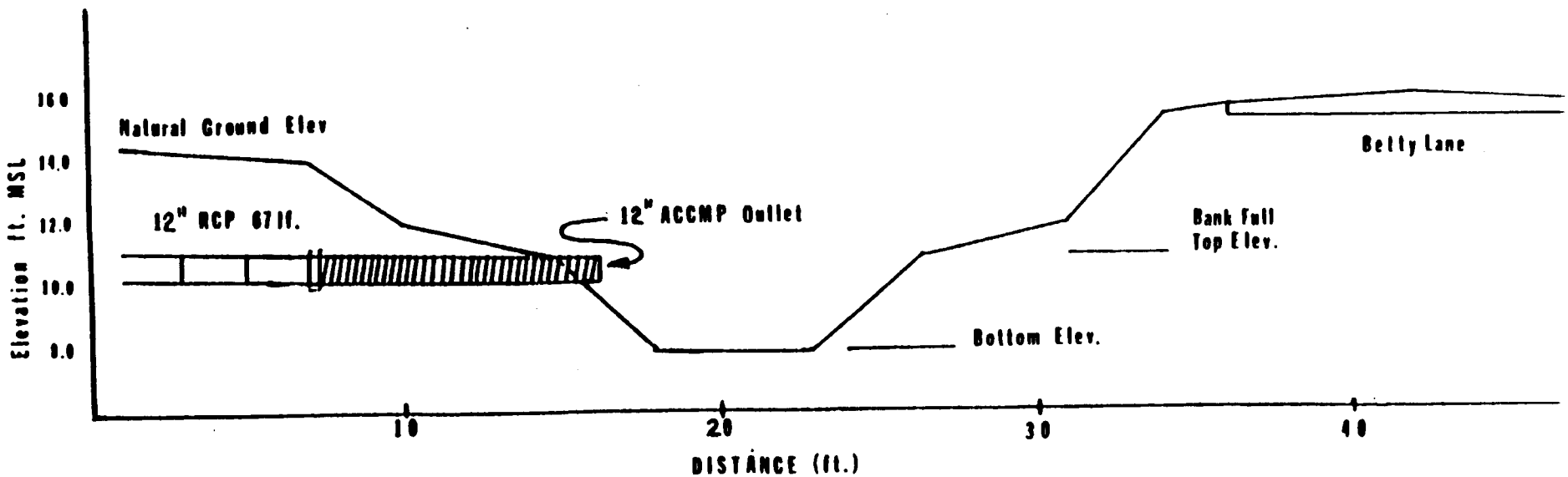
$$= 10.6 \text{ min.}$$

As stated earlier, the time of concentration (Tc) may be determined by adding the travel time through each reach. In this instance, (Tc) equals "overland flow" time of travel (i.e. 21 min.) plus "open channel" flow travel time (i.e. 10.6 min) or (31.6 min). In this problem use (Tc = 30 min) to estimate the rainfall intensity.

Enter Figure 5 at the point for the appropriate duration storm (i.e. 30 min). Proceed up the page to the point where the line intersects the curve associated with the appropriate return frequency storm (i.e. 25 yr). Read the value of rainfall intensity opposite this point from the vertical scale along the left hand side of the graph.

R0071605

Typical Channel X-Section



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Reference: Volume 2 Procedures, Florida Department of Transportation Drainage Manual. 625-040-205-a, Page 78 of 98.

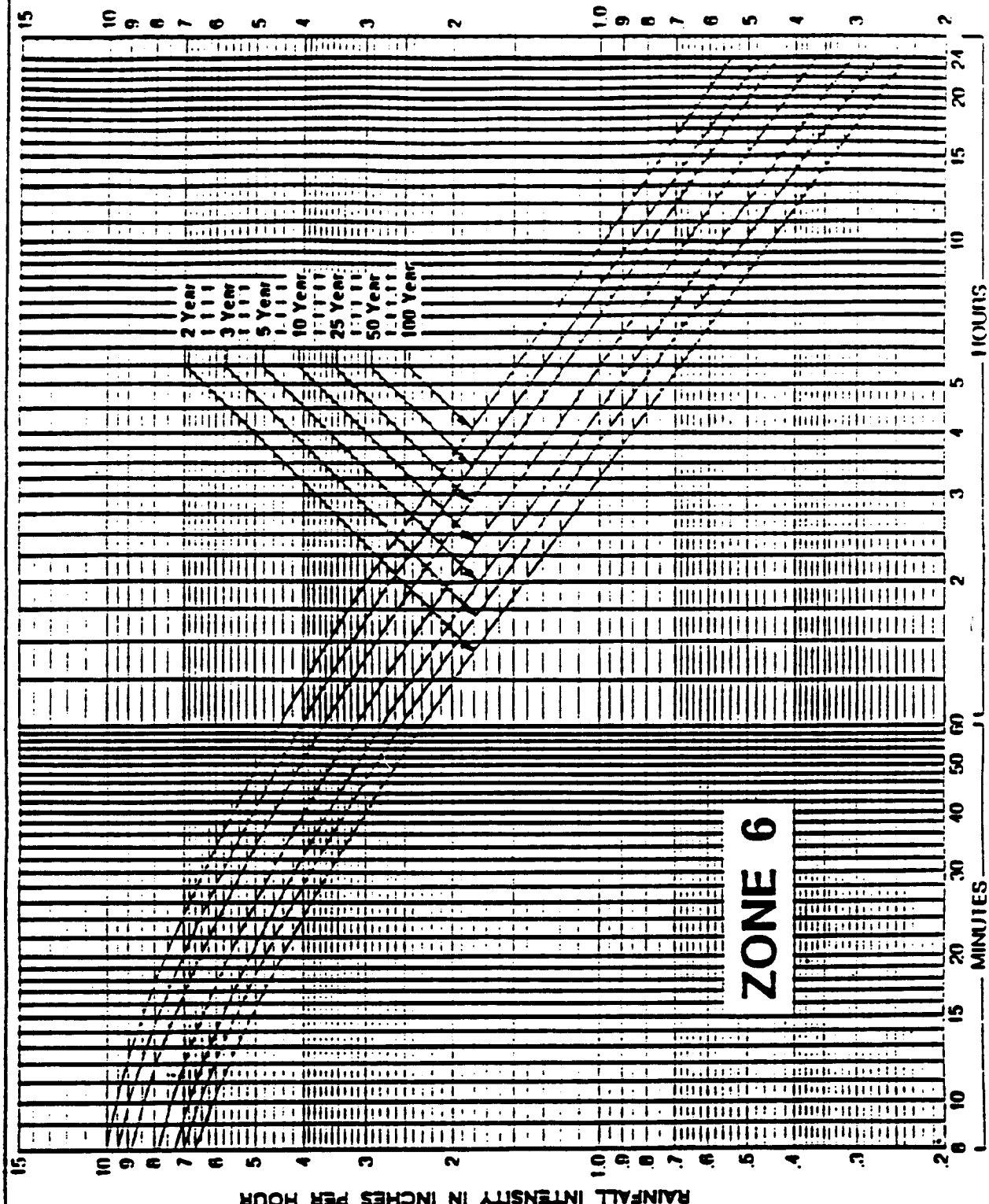

FIGURE 5
Rainfall Intensity-Duration-Frequency Curves for Zone 6

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I 25 yr. = 5.4 in/hr. (Zone 6, FDOT Drainage Manual) Determine peak rate of discharge (Qp) expected in the receiving stream for the 25 year frequency storm. Use the Rational Formula.

$Q = CIA$

where; the values of each factor are as discussed earlier such that ($C = 0.25$), ($I = 5.4$ in/hr) and ($A = 14.7$ Ac.)

$Q = CIA = (0.25)\ (5.4)\ (14.7) = 19.8$ cfs.

(B) Having established the 25 year peak discharge the engineer may now continue with other procedures for the determination of flood stage in the drainage ditch during the design storm.

One simple and easy to use procedure is called "Normal Depth Analysis". The method is well described by the St. Johns River Water Management District, Applicants Handbook Management and Storage of Surface Waters. The method as applicable to this example may be outlined as follows:

(1) Divide the channel section into one or more subsections or segments each having a reasonably uniform roughness coefficient, A_1, A_2, A_3 -- A_n. In this case assume the channel is uniform. Enter appropriate number of subsections as illustrated in Table 3.
(2) Determine "n" value for each individual sub-section, ("n" = .05) as noted earlier in part (A) of this example.)
(3) Select a flood stage, y_1 as a first estimate.
(4) Determine the slope of the channel (S), the cross section area (A), and hydraulic radius (R) in order to compute conveyance capacity for each sub-section based on floodstage y_1.
(5) Calculate the total discharge Q_1 that corresponds to the stage y_1. Use Manning's equation times the cross sectional area (A) to determine the discharge for each sub-section.
(6) If $Q_{25} > Q_1$, increase flood stage y_2 by a small increment. Follow steps (4) and (5) to determine Q_2.
(7) Repeat step (6) until several Q values above and below Q_{25} are established. Plot a stage vs. discharge curve from which a stage corresponding to Q_{25} can be determined.

Figure 6 illustrates the stage discharge relationship in the receiving stream at the point of discharge . Calculations are shown on Table 3. As may be seen the stage in the canal or ditch which corresponds to the peak discharge expected from the 25 year reoccurance interval storm would be approximately 9.7 feet mean sea level (MSL). In this instance, setting the outfall elevation of the discharge structure at 10.0 ft. MSL will insure that the facility is capable of operation without restrictions due to backwater effects in the receiving stream for storms up to and including the 100 year event.

The next step in the design is to:

II. <u>Determine Detention Area Storage Capacity Needed to Satisfy both State Stormwater Water Quality Regulations and Local Maximum Allowable Rate of Discharge Limitations:</u>

R0071608

Table 3

Normal Depth Analysis
Turnkey Site

Stage	Sub-sect. No.	Channel Area (A)* Sq. Ft.	Wetted Perimeter (P)** Ft.	(R) Hydraulic Radius A/P	$R^{2/3}$	Slope (S) Ft/Ft.	$S^{1/2}$	Mannings "n"	Discharge*** Q (cfs)
8.75 MSL (Y_1)	1	4.37	7.23	.60	.711	.0025	.05	.05	15.6
10.0 MSL (Y_2)	1	14.4	10.95	1.32	1.203	.0025	.05	.05	26.3
9.5 MSL (Y_3)	1	9.98	9.46	1.05	1.033	.0025	.05	.05	22.6

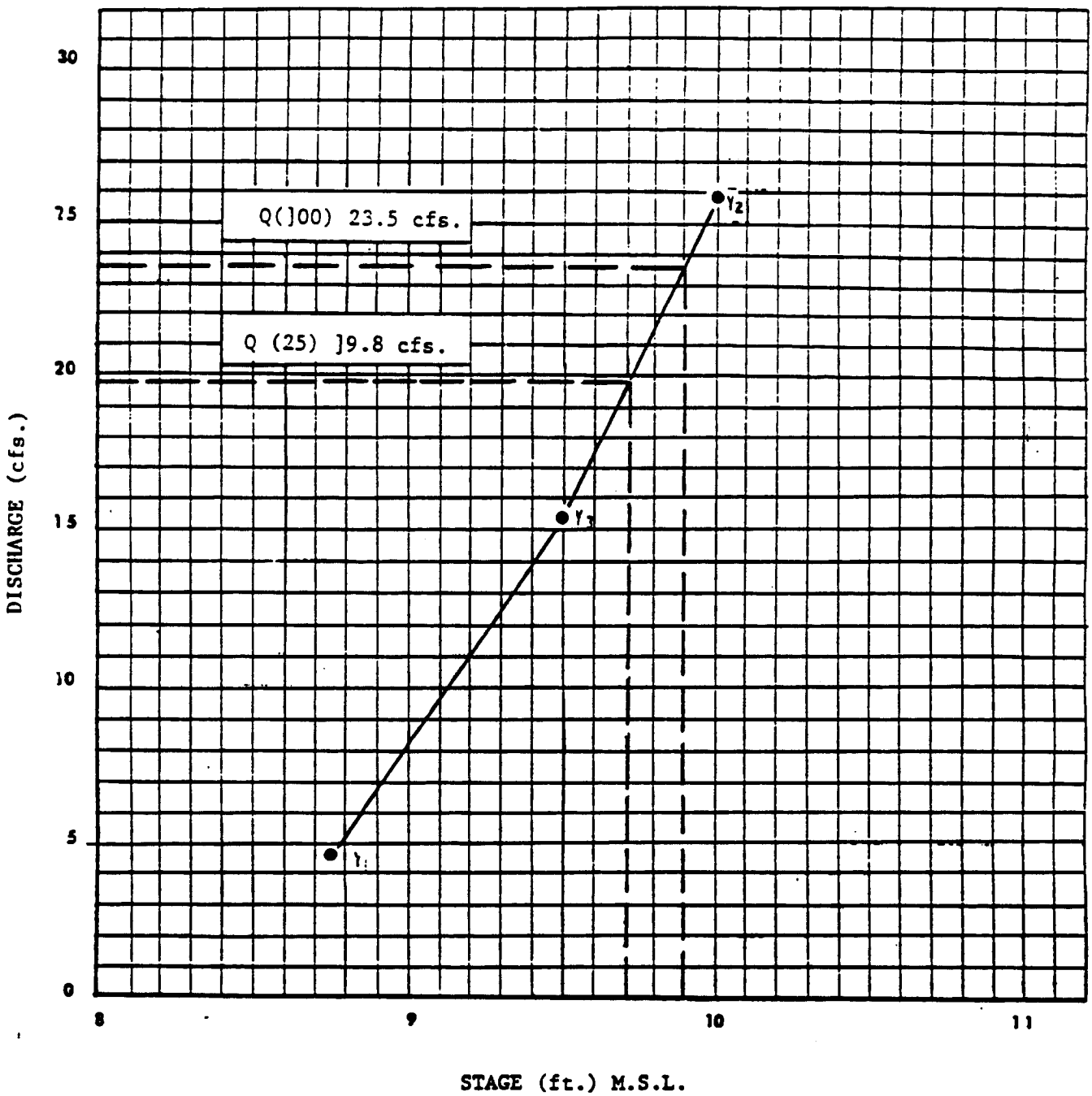
* (A) Area of trapezoidal sections = $bd + z(d^2)$
b = bottom width (5')
d = depth of flow
z = side slope-ft. horizontal/ft. vertical (1:1)

** $(P) = b + 2(d)(z^2 + 1)$

*** $Q = \frac{1.49}{n} \times R^{2/3} \times S^{1/2} \times A$

R0071609

Figure 6
Stage-Discharge Relationship Turnkey Site in
Drainage Ditch at Project Area Boundary



R0071610

(A) Stormwater quality regulations in Florida are listed in Florida Administration Code Rule 17-25.
State Requirements: Hold First 1/2" of runoff to be bled down within 72 hrs. by an underdrain or filter system, natural percolation, evapotranspiration, and/or evaporation.

$$\text{Volume} = \frac{(0.5 \text{ in.})\ (4.5 \text{ acres})}{12 \frac{\text{in}}{\text{ft}}} = 0.19 \text{ Ac-ft}$$

(B) Local Flood Control Requirements: Post development rate of discharge must not exceed predevelopment rate for the 25 yr. frequency storm. Due to the small size of the project use the Rational Formula to set the maximum allowable rate of outflow. Utilize "Modified Rational Method Analysis" to determine the maximum volume of storage needed to stay within this rate of release.

(1) The allowable release rate is calculated utilizing the Rational Formula (Q = CIA) with a "C" value characteristic of the undeveloped condition and an "I" value for a storm duration equal to the time of concentration (Tc) for the basin under historic conditions. (Sometimes termed "natural conditions")

(Tc) may be determined as discussed previously. Two types of flow conditions also exist in this sub-basin of the watershed. From a point in the southwest corner of the 4.5 acre tract in question, water traveling the maximum distance must move 600ft via overland flow laterally to the drainage ditch and subsequently move by "open channel" flow to the point of interest (outlet) 300 ft downstream. The velocity associated with each flow segment was established earlier. (i.e. 28 ft/min for "overland" flow and approximately 2.2 ft/sec. in the "open channel".) Therefore;

$$Tc = \frac{600 \text{ ft}}{(28 \text{ ft/min})} + \frac{300 \text{ ft}}{(2.2 \text{ ft/sec})} \times \frac{1 \text{ min}}{(60 \text{ sec})}$$

$$Tc = 21 \text{ min} + 2.3 \text{ min} = 23.3 \text{ min}$$

Use Tc = 20 minutes for convenience; however,
Tc = 25 minutes would be preferred, given a real situation.

From Figure 5 determine rainfall intensity (I) for the 25 yr./20 minute duration storm.

I = 6.5 in/hr (FDOT Drainage Manual, Rainfall Intensity Chart, Zone 6.)

Working through the equation;
C (Predevelopment) = 0.25, as noted previously.
Area = 4.5 Acres (Figure 2)
I = 6.5 in/hr.

Maximum Release Rate or Outflow
Qp(Natural) = CIA (.25)(6.5)(4.5) = 7.3 cfs.

(2) Modified Rational Method Analysis: The term Modified Rational

R0071611

Method Analysis refers to a procedure for manipulating the basic Rational Method techniques to reflect the fact that storms with durations greater than the normal time of concentration for a basin will result in a larger volume of runoff even though the peak discharge predicted is reduced. This greater volume of runoff projected by longer duration storms must be analyzed to determine the correct sizing for detention facilities unless a specific storm duration is mandated for design purposes.

In applying this procedure the typical Rational Formula hydrograph with the peak discharge coinciding with the time of concentration for the basin (T_c), is first calculated using the normal formula Q = CIA. Following this, a family of hydrographs representing storms of greater duration are developed. The peak runoff rate for each hydrograph is equal to CIA where (I) is the rainfall intensity for the storm duration in question. The rising limb and falling limb of the hydrograph are, in each case, equal to (T_c) for the basin. The basic assumption of this method is that the area under the assumed trapazoidal hydrograph equals the volume of runoff from the theoretical rainfall. The area under the hydrograph is also equal to the peak discharge rate for that particular rainfall times the duration of the event.

In this example assume (T_c) following development will be reduced from 20 to 15 minutes. A family of hydrographs can be developed provided that the runoff coefficient (C) for the developed project is known.

(a) The runoff coefficient following construction C (Post) may be determined based on information illustrated in Figure 2 and the values listed in Table 1.

Land Use	Acres (A)	Runoff Coefficient (C)	(A) x (C)
(Fig. 2)	(Fig. 2)	(Table 1)	
Pavement	1.15	.95	1.09
Roofs (Aptm. Building)	1.10	.95	1.05
Lawns & Other Grassed Areas (Sandy Soil, Flat Slope)	2.25	.10	.23
	4.50 Total	Total	2.37

$$C\ (Post) = \frac{A\ C\ (Total)}{A\ (Total)} = .53$$

R0071612

(b) The composit runoff coefficient as determined above is subsequently used in combination with the average rainfall intensity expected from the various duration events in inches per hour and the area of the watershed in acres to calculate the peak rate of runoff as listed in Table-4 and illustrated in Figure-7. It was mentioned previously that the area inscribed by each hydrograph and the volume of runoff in ft^3 is equal to the peak discharge rate (cfs) for that particular rainfall times the duration of the event when converted to seconds. The values for the particular watershed used in this example are listed under the column marked "Inflow" in Table-4 which also corresponds to the area under the inflow hydrographs shown on Figure-7.

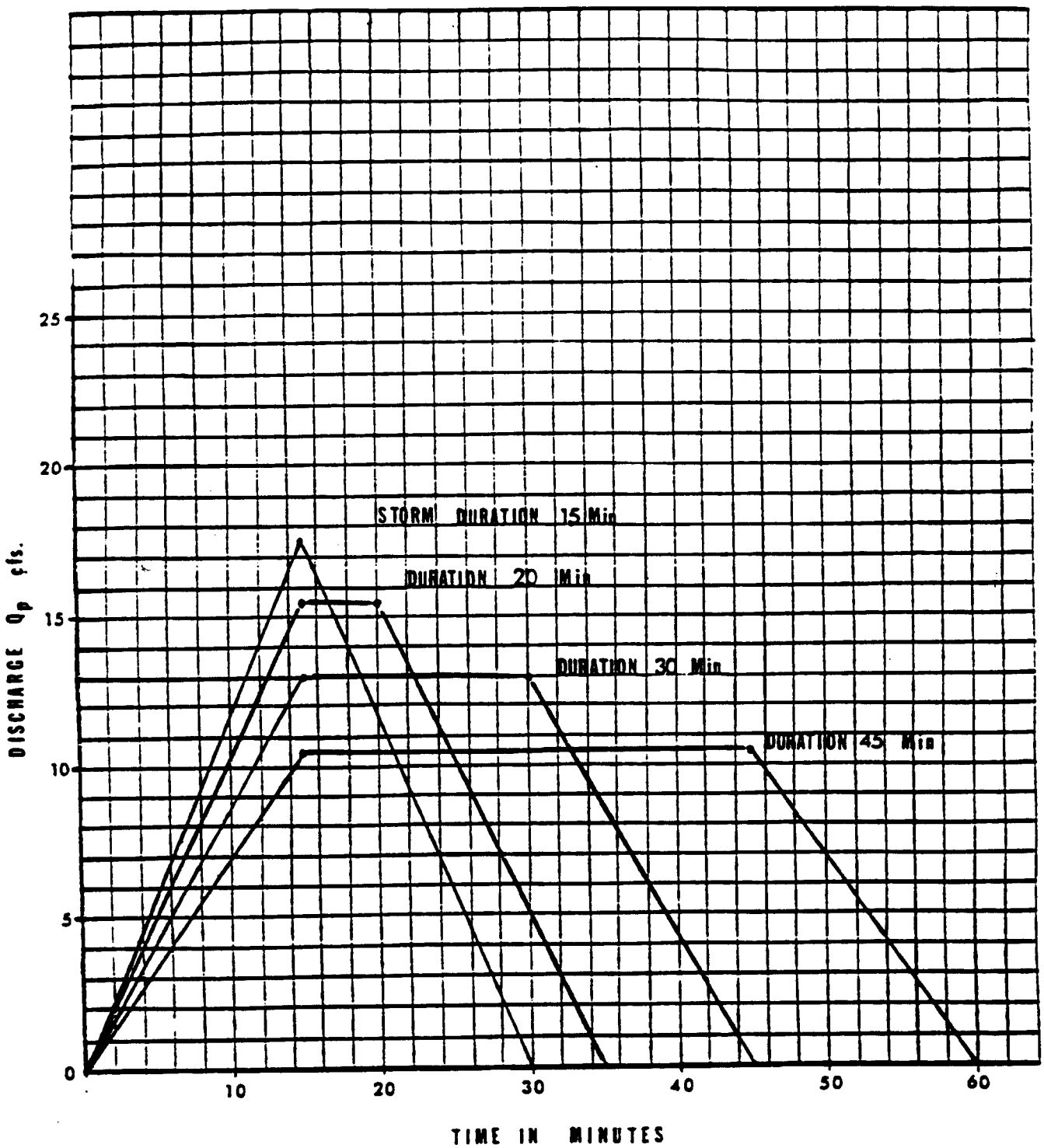
"Rational Method Analysis" and other appropriate procedures normally include the simultaneous calculation of the outflow hydrograph. The maximum allowable release rate Qp (Natural) or QpN which was calculated earlier based on the historic or predeveloped conditions represents the peak of the outflow hydrograph, and the limit of the discharge which the control structure is designed to regulate. The volume of inflow which is expected to enter the facility in excess of the outflow volume leaving the system during the same time frame must be temporarily stored in the facility and released following the termination of rainfall. Most agencies concerned with water quantity control expect the engineer to size the detention facility to accomodate the storage needed for a specific return frequency storm of a duration and intensity sufficient to generate the largest difference between total inflow and outflow. Hence, the need to look at a multiple of design events of variable duration.

Concrete box inlet drop spillway control structures in combination with rectangular weirs similar to that illustrated in Figure-8 are among the most commonly used discharge facilities. The following discussion will be related to the procedures normally used in the design of this type of installation, when used in combination with an underdrain or filter system to satisfy state water quality criteria.

In conventional detention facility design the outflow hydrograph would be constructed overlapping the inflow hydrographs. As stated earlier, since the objective of the system is to duplicate historic conditions the outflow structure must be built to meet the maximum peak flow and often the time to peak (Tc usually = Tp in rational method analysis) expected assuming the watershed had remained undeveloped. In this case, it has been previously specified that the time of concentration (Tc) in the predeveloped state equals 20 minutes and the maximum

Figure 7
Modified Rational Method Hydrographs-Turnkey Aptms.

(Time of Concentration Tc = 15 min.)



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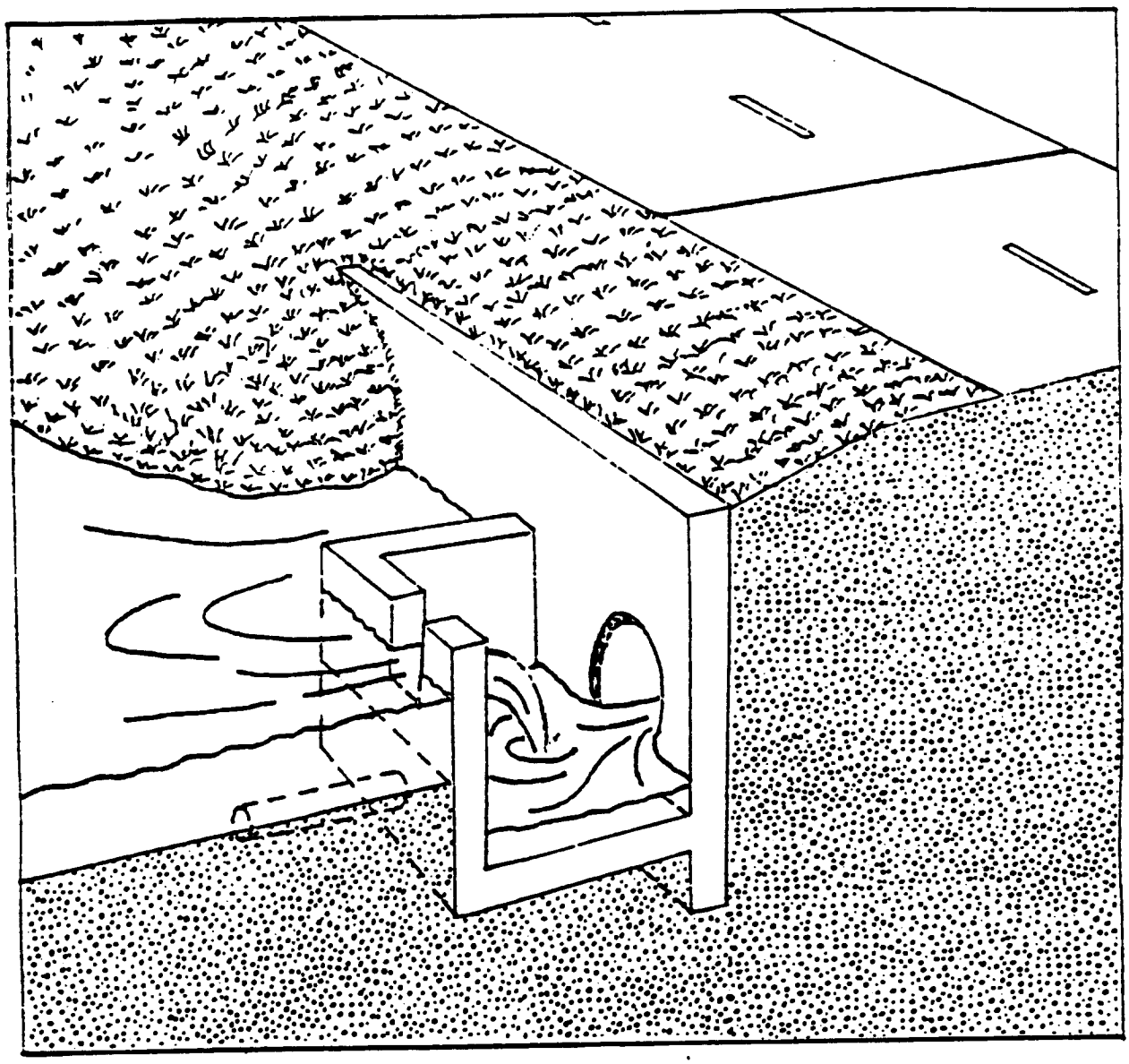

Figure 8
Detention Facility with Underdrain Pipe and Slotted
Concrete Box Drop Inlet Water Control Structure

permissible 25 year peak discharge Qp = 7.3 cfs. The outflow hydrograph superimposed on the inflow hydrograph is shown in Figure-9. The area formed by the outflow line and its intersection with the receding leg of each inflow hydrograph represents the total outflow volume. The magnitude of outflow associated with each storm may be estimated graphically from Figure-9 or it may be calculated using the following equation:

$$V(out) = 1/2Qp(N)\ [2(D + TcD) - (TcN + \frac{Qp(N)\ TcD}{Qp(D)})]$$

where:

V(out) = Volume of discharge (ft^3)
Qp(N) = Max. permissible rate of discharge or peak discharge under natural conditions (cfs)

Qp(D) = Peak discharge rate following development (cfs)
D = Storm duration (sec)
TcD = Time of concentration expected for the developed condition (sec)
TcN = Time of concentration expected for the watershed given historic or natural conditions (sec).

The results of calculations for the watershed in this example are shown in the column under the heading "Outflow" in Table-4. The maximum storage or detention volume listed in the last column of the table will not always be largest for any particular duration storm event. As noted earlier, more than one time increment should be used when evaluating the maximum storage volume required. That is, unless the regulating authority has adopted a specific duration it wishes to have the engineer design too.

From Table-4
Maximum Required Storage = 9,832 ft^3 for flood control.
Therefore;
City requirements for storage is <u>0.23 Ac-Ft.</u>

(c) It should be noted that the analysis of storage volume conducted above in part (b), is based on the presumption that runoff water is constantly being discharged up to a certain rate (maximum allowable release rate). Such analyses are appropriate for the design of conventional detention systems. However, other regulations which specify that a certain amount of this water (say 1/2" of runoff) must be stored and filtered or percolated through the soil prior to release may act to increase the storage volume that must be provided. In some cases this can be quite a substantial increase. The affect must be

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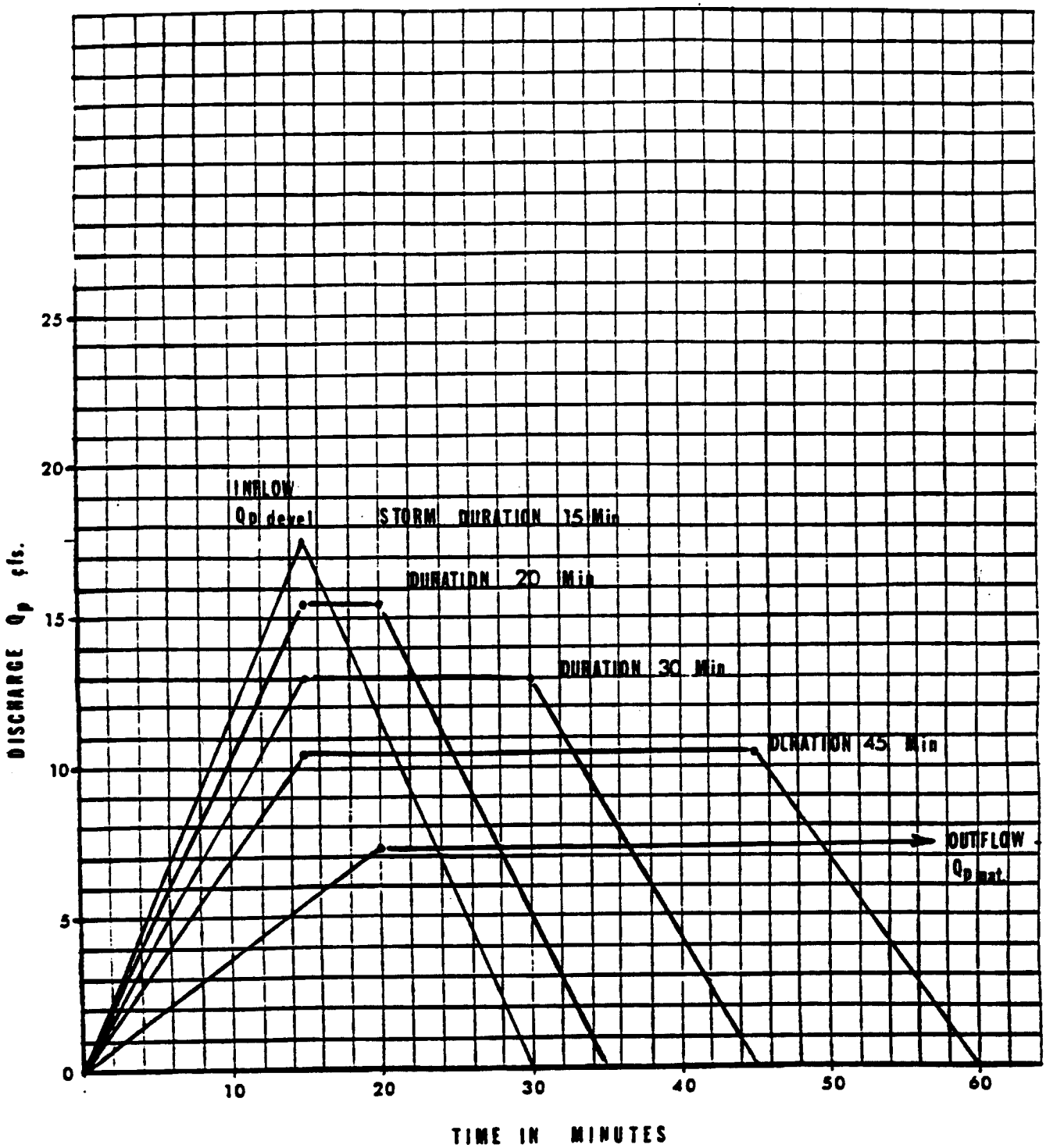

Figure 9
Conventional Rational Method Inflow and
Outflow Hydrograph Turnkey Apts.

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TABLE 4

MODIFIED RATIONAL METHOD ANALYSIS
25 YEAR FREQUENCY ZONE 6
Turnkey Apt. (Det. Area)

RAINFALL DURATION (MIN.)	RAINFALL/1 INTENSITY (I) (IN/HR)	RAINFALL DURATION (D) (SEC.)	PEAK/2 RUNOFF RATE Qp(D) (cfs)	INFLOW/3 (FT^3)	OUTFLOW/4 (FT^3)	STORAGE/5 (FT^3)
15	7.32	900	17.46	15,714	7,387	8,327
20	6.50	1,200	15.50	18,600	9,403	9,197
30	5.43	1,800	12.95	23,310	13,478	9,832
45	4.41	2,700	10.52	28,404	19,620	8,784
60	3.73	3,600	8.90	32,040	25,776	6,264
75	3.25	4,500				
90	2.88	5,400				
105	2.59	6,300				
120	2.37	7,200				
150	2.04	9,000				
180	1.80	10,800				
240	1.48	14,400				
360	1.12	21,600				
480	0.92	28,800				
720	0.70	43,200				
960	0.58	57,600				
1200	0.50	72,000				
1440	0.44	86,400				

---

(1) Intensity - Determined from FDOT 25 yr. frequency, Rainfall Intensity Duration Curves, Zone 6

(2) Peak Runoff (cfs) = CIA (C = 0.53, A = 4.5 Ac, I = value from second column)

(3) Inflow = Peak Runoff (cfs) x Duration (sec.)

(4) Outflow $V(out) = 1/2\ Qp(N)\ [\ 2(D + TcD) - (TcN + \frac{Qp(N)\ TcD}{Qp\ (D)}]$

(5) Storage = Inflow (Ft^3) - Outflow (Ft^3)

NOTE:

Time of Concentration Predevelopment TcN = 20 min. or 1200 sec.
Time of Concentration Post Development TcD = 15 min. or 900 sec.
Max. Allowable Release Rate Qp(N) = 7.3 cfs.

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evaluated in order to insure that the level of flood protection mandated by the local government is maintained.

For instance, Figure-10 once again depicts the array of inflow hydrographs expect from a 25 year return frequency event for four different durations of rainfall. However, the outflow hydrograph has been modified to reflect the fact that discharge will be limited to that leaving via the subsurface drain until the 1/2" storage elevation is reached. From Figure-10 it may be observed that while the general shape and peak discharge (i.e., maximum allowable rate of release) is the same for each event, the time to peak is shifted toward the right of the graph as the duration of the event increases. This is due to the shape of the inflow hydrographs derived using "rational method analysis" in which the peak rate of inflow is reduced as the rainfall duration increases and average intensity decreases. Therefore, it takes more time for the 1/2" storage elevation and the onset of weir outflow to be achieved. In this case, the basic affect of the underdrain is to move the outflow hydrograph constructed based on weir flow alone (Figure-9) to the right. As a result, less water will have been discharged over the course of the storm than would have been predicted using the procedures discussed in the preceeding section. More storage is required to insure the proper level of flood protection. The elapsed time for weir outflow to begin must be calculated for each storm duration before the outflow hydrograph may be constructed.

In order for this to be done, the designer must:

1. Select or establish the depth of the storage area required to hold the first 1/2 inch of runoff or the runoff from the first inch of rainfall as appropriate from the contributing drainage area. In most cases the design and this analysis may be simplified if the engineer simply chooses a storage depth desired. (In this example problem assume the desired depth of storage is 1.75 feet.)

2. Determine the point on the inflow hydrograph where in the 1/2" storage volume or the runoff from the first inch of rainfall occurs.

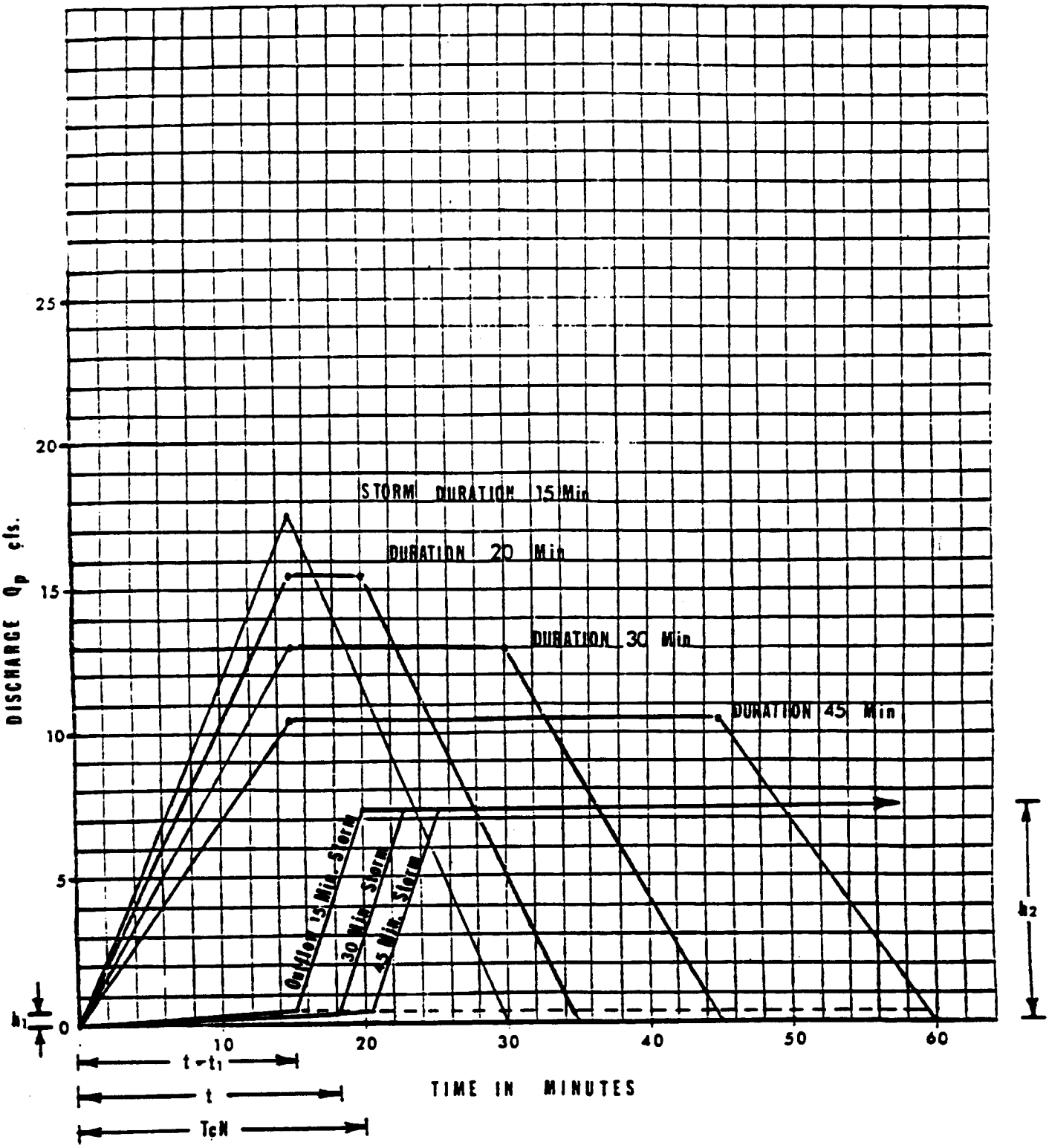
   In this particular example, for the maximum peak producing storm (i.e., that storm where duration (is equal to the time of concentration) this point may be determined based on the following equation:

$$t = 2Tc - (2Tc^2 - \frac{2Vs\ Tc}{Qp})1/2$$

   where;

Figure-10

Inflow and Outflow Hydrographs of Various
Duration Events for Turnkey Apts.
Detention/Filtration Facility



(Time of Concentration Tc = 15 min.)

(Time of Concentration Natural Conditions TcN = 20 min.)

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t = time in which the required storage volume is reached (sec)
Tc = time of concentration following development (sec)
Vs = storage volume (ft^3) needed to satisfy state water quality criteria found in section 17-25.03(2)(b), F.A.C.
Qp = peak flow expected for the storm whose duration equals Tc (cfs).

The derivation of this formula may be found at the end of this chapter (see Appendix A). However, the equation is only suitable for use when the 1/2 inch storage volume or the runoff from the first inch of rainfall occurs following the peak of the hydrograph. This may be determined by calculating the volume of discharge associated with the rising limb of each duration storm and comparing its value with that previously determined for the 1/2 inch storage volume (i.e. .19 Ac.-Ft. or 8,276 ft^3, in this instance). If the value is less than required storage, the previous equation may be used for the peak producing storm (i.e. duration = Tc). Watersheds with values of "Tc" less than 20 minutes will generally fall into this category. In these instances the appropriate storage volume will be reached during the falling leg of the maximum peak producing hydrograph.

A second equation is required to calculate the time to reach the appropriate storage or filtration volume for those circumstances when storm duration exceeds the time of concentration such that this point occurs sometime during the constant discharge phase of the hydrograph. As illustrated in Appendix B, Equation B-1, the time (t) to reach the point where the appropriate storage volume is satisfied and beyond which weir flow begins can be calculated as follows:

$$t = \frac{Tc}{2} + \frac{Vs}{QpD}$$

where:

t = Time for inflow to reach the appropriate treatment volume (sec)
Tc = Time of concentration (sec)
Vs = 1/2 inch treatment volume or runoff associated with the first inch of rainfall
QpD = Peak discharge from the design storm for the duration under consideration (cfs).

In this example the peak discharge (Qp) expected from the storm with a duration equal to (Tc) was determined to be 17.46 cfs. Since the time of

concentration was listed as 900 sec. or 15 min., the volume of inflow associated with the 15 min. duration event is equal to 1/2 (17.46)(900) = 7,857 ft^3; therefore, the time required to reach the appropriate storage volume desired (i.e., .19 Ac.-Ft.) or (8,276 Ft^3) will follow the peak discharge for every storm duration being considered. Equation A-1 may be used to claculate time (t) to reach the appropriate filtration volume for te 15 min. duration event. Values of (t) associated with other events may be determined using equation B-1. Similar equations for calculating the time to reach the appropriate volume for filtration when this point occurs sometime during the rising leg of the hydrograph may be found in Appendix C.

Table 5 lists the value (t) or time required for inflow to reach the 1/2 inch storage volume for the 15, 20, 30, 45, and 60 minute duration event in this example problem.

3. Based on site conditions, the intended use of the area, the type of facility (i.e., wet or dry), and the ingenuity and desires of the owner and designer, the configuration and layout of the detention facility and filter system is proposed. The size of the filtration bed required to accomplish drawdown within the 72 hour time frame mandated in 17-25, F.A.C. may be estimated using a number of procedures discussed in design criteria section of the Standards and Specifications for Underdrains and Filtration Systems. However, the length and width of many of these facilities are also determined based on experience of the designer. In these instances, it is the task of the designer to check for compliance with state and local regulation. For this example problem the engineer wishes to use a 265 ft long bottom filter approximately 2.5 ft. in width.

4. The discharge rate expected from the filter system at the invert elevation of the outfall structure must be determined. In filter design all outflow is usually presumed to pass through the surface of the filter.

   Given these circumstances, (Q_F) the instantaneous rate of discharge from a bottom filter or underdrain system may be estimated using Darcy's Equation assuming saturated flow conditions.

$$[Q_F = KIA = K\ (Y/D)\ A]$$

   where;
   K = Coefficient of soil permeability or filter material as appropriate (in./hr.)

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TABLE 5

Time Required for Volume of Inflow to Equal the 1/2 Inch Volume for Filtration (Turnkey Apt. Det. Area)

Time of Concentration (Tc) = 15 min. or 900 sec.
1/2 inch Treatment Volume (Vs) = .19 Ac. Ft. or 8,276 Ft^3.

RAINFALL DURATION (MIN.)	RAINFALL/1 INTENSITY (I) (IN/HR)	RAINFALL DURATION (D) (SEC.)	PEAK/2 RUNOFF (Qp) RATE (cfs)	TIME (t) TO/3 1/2" STORAGE (SEC.)
15	7.32	900	17.46	924
20	6.50	1,200	15.50	984
30	5.43	1,800	12.95	1,089
45	4.41	2,700	10.52	1,237
60	3.73	3,600	8.90	1,380
75	3.25	4,500		
90	2.88	5,400		
105	2.59	6,300		
120	2.37	7,200		
150	2.04	9,000		
180	1.80	10,800		
240	1.48	14,400		
360	1.12	21,600		
480	0.92	28,800		
720	0.70	43,200		
960	0.58	57,600		
1200	0.50	72,000		
1440	0.44	86,400		

---

(1) Intensity - Determined from FDOT 25 yr. frequency, Rainfall Intensity Duration Curves, Zone 6

(2) Peak Runoff (cfs) = CIA (C = 0.53, A = 4.5 Ac, I = value from second column)

(3) Time to 1/2" storage (t) = $2Tc - \left(2Tc^2 - \frac{2VsTc}{Qp}\right)^{1/2}$

for 15 min. duration.

$t = \frac{Tc}{2} + \frac{Vs}{Qp}$ for all other duration events (see Appendix A & B).

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Y/D = Hydraulic Gradient (ft./ft.) (see Figure 11)
A = Surface area of the trench (Ac)

working through the equation; assuming,
Q_F = 12 in./hr. (based on lab permeability test of FDOT U.D. Sand)

Y = 3.75 ft. (Figure 11)
D = 2.0 ft. (Figure 11)

$$12 \text{ in/hr.} \times \frac{3.75 \text{ ft.}}{2.00 \text{ ft.}} \times \frac{(265 \text{ ft})\ (2.5 \text{ ft})}{43{,}560 \text{ ft}^2/\text{Ac}}$$

Q_F = (12 in./hr.) (1.875)(0.015 Ac)

Q_F = 0.34 cfs Use: Q_F = .35 cfs.

This represents the discharge from the detention facility when the water level is at the invert elevation of the rectangular slot in the discharge control structure illustrated in Figure 8. It also represents the value (h_1) of the outflow hydrograph illustrated in Figure 10.

5. The second stage of the outflow curve is constructed assuming that the peak rate of discharge and time to peak will be limited to the values determined previously. As illustrated in Figure 10 the maximum rate of release (h_2) is restricted to 7.3 cfs as before, and the minimum time to reach this rate of outflow will be maintained equivalent to the predevelopment condition (TcN = 20 min.).

Once these values are established, it is possible to determine the volume of outflow, by considering the outflow hydrograph to be represented by 2 trapezoidal shaped figures separated along a line (b_2) parallel to the horizontal or (X) axis of the graph at height h_1. The volume associated the lower trapezoid may be calculated by converting the time increments to seconds and multiplying 1/2 the base plus top length by the value of h_1 (ie., .35 cfs). The base (b_1) is equal to the storm duration (D) plus the value of the time of concentration (Tc). For this example, the base (b_1) associated with the 20 minute duration event where Tc is equal to 15 minutes, would be equivalent to 20 minutes plus 15 minutes = 35 minutes or 2100 seconds.

The top length (b_2) may be calculated by subtracting the time (t) to reach the 1/2 inch runoff volume (see Table-5) from the base (i.e., 2100 sec). In addition, the horizontal distance (X) associated with the point of intersection of line (b_2) and the

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receding leg of the inflow hydrograph must also be subtracted from the base. Its value may be determined since the distance along the X axis associated with a height of (h_1) above the falling leg of the hydrograph will be proportional to the horizontal distance (Tc) and peak flow (Qp)
In equation form:

$$\frac{X}{h_1} = \frac{Tc}{Qp} \quad \text{or,} \quad X = \frac{Tc\ h_1}{Qp}$$

Therefore, the length of line (b_2) separating the 2 figures at h_1 may be written:

$$b_2 = (D + Tc) - (t + \frac{Tc\ h_1}{Qp})$$

Going back to this example, the value of b_2 associated with a storm of 20 minutes duration, time of concentration Tc = 15 minutes, and the time to the 1/2" runoff volume t = 16.4 minutes, would be:

$b_2 = (1200 + 900) - (984 + 900\ (.35/15.5) = 1096$ sec.

At this point, the volume (V_1) associated with the lower trapezoid may be calculated, as follows, when the time increments are converted to seconds.

$V_1 = 1/2\ h_1$ (base b_1) + (b_2) therefore,

$$V_1 = 1/2\ h_1\ (D + Tc) + (D + Tc) - (t + \frac{Tc\ h_1}{Qp}) \text{ or;}$$

$$V_1 = 1/2\ h_1\ [\ 2\ (D + Tc) - (t + \frac{Tc\ h_1}{Qp})]$$

where:

V_1 = Volume associated with the lower trapezoidal figure (ft^3);
h_1 = Discharge expected from the filter when the 1/2" storage volume is reached (cfs);
D = Duration of the design storm (sec);
Tc = Developed time of concentration (sec);
Qp = Peak discharge expected from the design storm based on the rational formual (cfs);
t = Time to reach the 1/2" storage volume as shown in Table-5 (sec).

Estimating the volume (V_2) associated with the upper trapezoidal figure is slightly more difficult

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to determine; but, may be accomplished using the following procedures. As stated earlier, the height of the outflow hydrograph is limited to the maximum allowable rate of release, which in this case was established previously as the peak during predevelopment (QpN = 7.3 cfs). In equation form:

$h_2 = QpN$

The value of the base (b_2) was determined in the preceding section. Remember, for the 20 minute storm b_2 was found equal to 1096 seconds. However, the top length of the upper trapezoid must also be calculated in order to determine the value of V_2.

Assuming that the post development time to peak discharge must duplicate predeveloped conditions, the outflow will be limited such that the peak producing storm (i.e., 15 min. storm in this case) will reach the maximum allowable release rate (QpN = 7.3 cfs) within the same time as occurred during predeveloped conditions. Since the time to peak Tp is equal to the time of concentration in rational method analysis, the time to reach the peak rate of the outflow for the peak producing storm where D = Tc will be equal to the natural condition time of concentration (TcN) which is equal to 20 minutes. Assuming the same rate of rise for other duration storms, this value will be increased by the difference between the time (t) to reach the 1/2 runoff volume for the storm in question and (t_1) which is that associated with the peak producing event. In equation form, TcN + t - t_1) must be subtracted from the total length of the base (b_2) of the outflow hydrograph.

Likewise, the horizontal distance (X) from the terminus of the inflow hydrograph to the point where the maximum allowable release rate line (b_3) intersects the receding leg of the inflow hydrograph should also be subtracted from the length of the base in order to determine the top length of the upper portion of the outflow figure. Once again, the distance associated with the point of intersection with the falling leg and the end of inflow is proportional to the time of concentration Tc and the peak discharge Qp of the hydrograph, such that:

$$\frac{X}{h_2} = \frac{Tc}{Qp} \quad \text{or,} \quad X = \frac{Tc\ (h_2)}{Qp}$$

Therefore, the top length (b_3) of the upper trapezoid may be determined using the following equation:

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$$b_3 = (D + Tc) - (TcN + t - t_1 + \frac{Tc\ (h_2)}{Qp})$$

Consequently, the volume of runoff (V_2) associated with the upper portion of the outflow hydrograph (i.e., the area above h_1) may be determined as follows:

$V_2 = 1/2\ (h_2 - h_1)(b_2 + b_3)$ since;

$$b_2 = (D + Tc) - (t + \frac{Tc\ h_1}{Qp}) \text{ and,}$$

$$b_3 = (D + \frac{Tc}{Tc\ h_2}) - (TcN + t - t_1 + \frac{}{Qp})$$

$$V_2 = 1/2\ (h_2 - h_1)\ [\ 2(D + Tc) - (2t - t_1 + TcN + \frac{Tc\ h_1}{Qp} + \frac{Tc\ h_2}{Qp})]$$

The total volume of outflow is equal to V_1 plus V_2. Therefore, the two equations may be combined as follows:

$$Vout = 1/2\ h_1\ [2\ (D + Tc) - (t + \frac{Tc\ h_1}{Qp})] +$$

$$1/2\ (h_2 - h_1)\ [2\ (D + Tc) - (2t - t_1 + TcN + \frac{Tc\ h_1}{Qp} + \frac{Tc\ h_2}{Qp})]$$

Where:

Vout = Total volume of outflow (cfs);
h_1 = Flow expected from filter at the 1/2" runoff elevation (cfs);
h_2 = Maximum allowable release rate (cfs);
Qp = Peak flow based on rational equation (cfs);
Tc = Time of concentration following development (sec);
TcN = Time of concentraton predevelopment (sec);
t = Time for inflow volume to equal the first 1/2" runoff or runoff from the first inch of rainfall for the storm duration in question (sec) (see Table 5);
t_1 = Time for inflow volume to reach the first 1/2" runoff or the runoff from the first inch of rainfall as appropriate for the peak

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producing storm where duration = Tc (sec). (NOTE: t_1 = t for this event).

Table-6 lists the results of these calculations for this example under the column marked "outflow". Notice that the maximum storage required (14,176 ft^3) is for the 45 minute duration event. This represents 44 percent increase in the volume of storage required over that which would be needed for water quantity control alone.

Due to expected difficulties with the operation and maintenance of these systems, some municipalities currently require that water quantity and water quality criteria be considered independently. In such an instance, this project would be required to provide slightly more than 18,100 ft^3 of storage area. However, for this example assume that the local review agency will allow the designer to take credit for the outflow which may leave the system during the course of the design storm in order to reduce the storage somewhat. Storage requirements to satisfy both water quantity and water quality regulations would equal approximately .33 Ac. ft. or 14,176 ft^3.

III. Sizing the Detention Area

Having established the volume of storage needed, the designer may next determine the average area needed for the facility. Its value may be calculated by dividing the storage volume by the depth minus any freeboard required. In this case it was noted earlier that the developer did not want the holding area to exceed 3 ft. deep. Given a further local requirement mandating that .5 feet of freeboard be maintained; in this example:

$$\text{Det. Area Size} = \frac{14,176\ ft^3}{2.5\ ft.} = 5,670\ ft^2 \text{ or } .13\ Ac.$$

IV. Evaluate Weir Size Required

The type of discharge control structure shown in Figure-8 is quite common in Florida. These structures employ a slotted opening or weir in association with a larger drop inlet of concrete or metal. The former is designed to control the runoff expected for the design storm. The latter helps pass larger less frequently occurring events through the facility with a minimum of restriction, hopefully avoiding any damage. In many cases, the smaller weir or slot sometimes called a bleeder notch is rectangular. However, some areas of South Florida, particularly those within the South Florida Water Management District currently require the use of "V" notched systems to slow drawdown, encourage greater settling, and thereby increase the amount pollutant removal associated with the system. Equations are available to calculate flow through most of these types of orifices. Several are

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TABLE 6

MODIFIED RATIONAL METHOD ANALYSIS OF
INFLOW AND OUTFLOW WITH INLINE FILTER
25 YEAR FREQUENCY ZONE 6
Turnkey Apt. (Det. Area)

RAINFALL DURATION (MIN.)	RAINFALL/1 INTENSITY (I) (IN/HR)	RAINFALL DURATION (D) (SEC.)	PEAK/2 RUNOFF RATE Qp(D) (cfs)	INFLOW/3 (FT^3)	OUTFLOW/4 (FT^3)	STORAGE/5 (FT^3)
15	7.32	900	17.46	15,714	4,224	11,490
20	6.50	1,200	15.50	18,600	5,813	12,787
30	5.43	1,800	12.95	23,310	9,140	14,170
45	4.41	2,700	10.52	28,404	14,228	14,176
60	3.73	3,600	8.90	32,040	19,234	12,806
75	3.25	4,500				
90	2.88	5,400				
105	2.59	6,300				
120	2.37	7,200				
150	2.04	9,000				
180	1.80	10,800				
240	1.48	14,400				
360	1.12	21,600				
480	0.92	28,800				
720	0.70	43,200				
960	0.58	57,600				
1200	0.50	72,000				
1440	0.44	86,400				

---

(1) Intensity - Determined from FDOT 25 yr. frequency, Rainfall Intensity Duration Curves, Zone 6

(2) Peak Runoff (cfs) = CIA (C = 0.53, A = 4.5 Ac, I = value from second column)

(3) Inflow = Peak Runoff (cfs) x Duration (sec.)

(4) Outflow = $1/2(h_1)\ [2(D + Tc) - (t + Tc(h_1)/Qp)] + 1/2(h_2 - h_1)$
$[2(D + Tc) - (2t - t_1 + TcN + Tc(h_1)/Qp + Tc\ (h_2)/Qp)]$

(5) Storage = Inflow (Ft^3) - Outflow (Ft^3)

NOTE:

Predevelopment time of concentration (TcN) = 20 min. or 1200 sec.
Time of Concentration (Tc) = 15 min. or 900 sec.
Max. Allowable Release Rate (MARR) = h_2 = 7.3 cfs.
Outflow from filter (h_1) = .35 cfs.

illustrated, and discussed in other sections of this manual, including Chapter 5, Stormwater Engineering Calculations.

As shown in Figure-8 the weir used in this instance is rectangular. Since flow from the underdrain or filter system is expected to be quite small in comparison to the maximum allowable release rate many municipalities will often allow the designer to ignore discharge from the filtration facility when sizing the outfall for flood control purposes.

The length of the weir opening which will limit the maximum rate of flow to that determined above may be calculated by rearranging the discharge equation for rectangular shaped weirs assuming free discharge. Use the following equation;

$$Qw = 3.33\ H^{3/2}\ L$$

where;
Qw = Flow through the weir gate in cfs
Discharge Coefficient = 3.33
H = Hydraulic head above the bottom of the weir opening in feet
L = Width of the weir opening in feet

In this example it was stated earlier that weir flow will begin at elevation 1.75' above the pond bottom. Since the overall depth ignoring .5 ft. freeboard is limited to 2.5 ft. The value of H = .75 ft. The value of Qw is limited the maximum allowable release rate (7.3 cfs). Therefore:

$$L \text{ (width of weir)} = \frac{Qw}{3.33\ H^{3/2}}$$

$$L = \frac{7.3}{3.33\ (0.75)^{3/2}} = 3.375 \text{ ft.}$$

A rectangular weir or slot .75 ft. deep and 3.4 ft. wide will be sufficient to limit outflow to the rate desired.

V. Evaluate Underdrain Drawdown Time

There are 4 factors restricting the removal of detained runoff through an underdrain or filter system. These are:

1. Permeability of soil or filter material as appropriate;
2. Permeability of filter fabric;
3. Size and number of pipe perforations;
4. Maximum pipe flow;

State regulations require a 72 hour maximum drawdown time to remove the first one-half inch of runoff for a drainage basin of 100 acres or less. It is reasonable to believe that the above 4 factors control this drawdown time. It is also reasonable to believe that the most restrictive of the above 4 factors would control the drawdown time.

The following is an analysis of the concerned detention basin:

Figures 11, 12 and 13 illustrate the important dimensions of the underdrain or filter system designed to serve this facility.

A. Analysis of Factors 1 and 2

Permeability of filter media (FDOT grade underdrain sand) vs. Permeability of Mirafi Fabric. According to information published by the University of Florida and several independent testing labs, the permeability of FDOT grade underdrain sand may vary from 6 to more than 24 inches per hour. Assume an inspection was conducted to confirm the percolation at the treatment location. It was determined through field tests that:

1. Filter Permeability = 12 inches/hr.

   According to the Celanese Fibers Marketing Pamphlet the permeability of the Mirafi 140S Fabric is:

2. Mirafi 140S fabric = 0.07 cm/sec = 99.3 inches/hr. (Ref. Post, Buckley, Schuh & Jernigan Eng.)

   From the above analysis, it is reasonable to assume that Factor 1, Soil permeability, is more restrictive to drawdown time. This eliminates Factor 2, permeability of fabric from the analysis.

   To complete the evaluation of drawdown time based on soil permeability the following equations can be used:

Darcy's Law

$$Q = KiA = K \frac{Y}{D} A$$

Where;
K = Coeff. of Soil Permeability (ft./hr.)
$i = \frac{Y}{D}$ = Instantaneous Hydraulic Gradient (ft./ft.)
A = Area of trench for underdrain or filtration (ft^2).

Falling Head Equation

$$t = \int_o^t dt = - \int_{Y1}^{Y2} \frac{A_R dy}{Q}$$

t = Drawdown Time (hrs.)
A_R = Average Area of Resevoir between elevation Y_1 and Y_2 (ft^2)
Y = Head difference between water level elevation behind the structure at any point in time and either the flow line of the underdrain pipe or the top of the gravel envelope when used (ft)
D = Depth of soil column or filter material (ft.).

Figure 11
Cross Section Detention Area

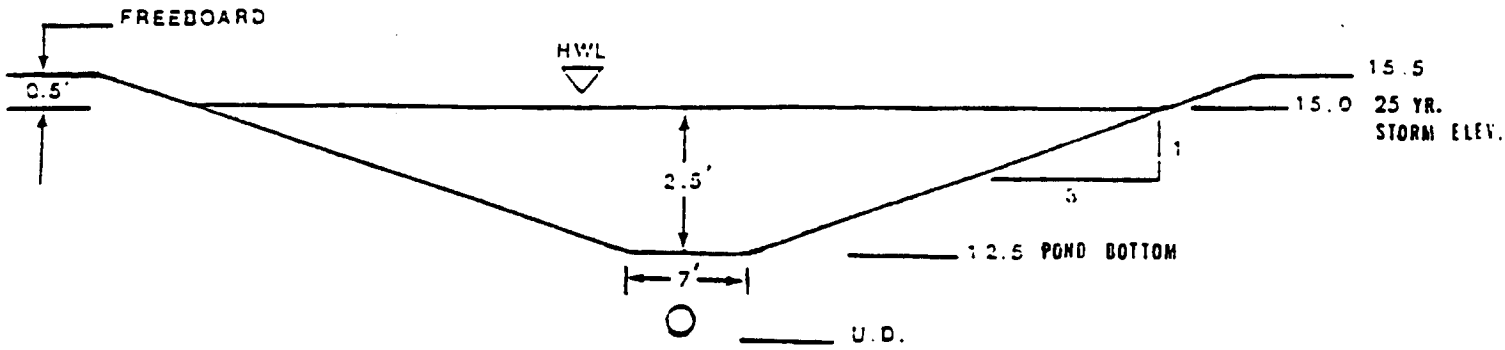
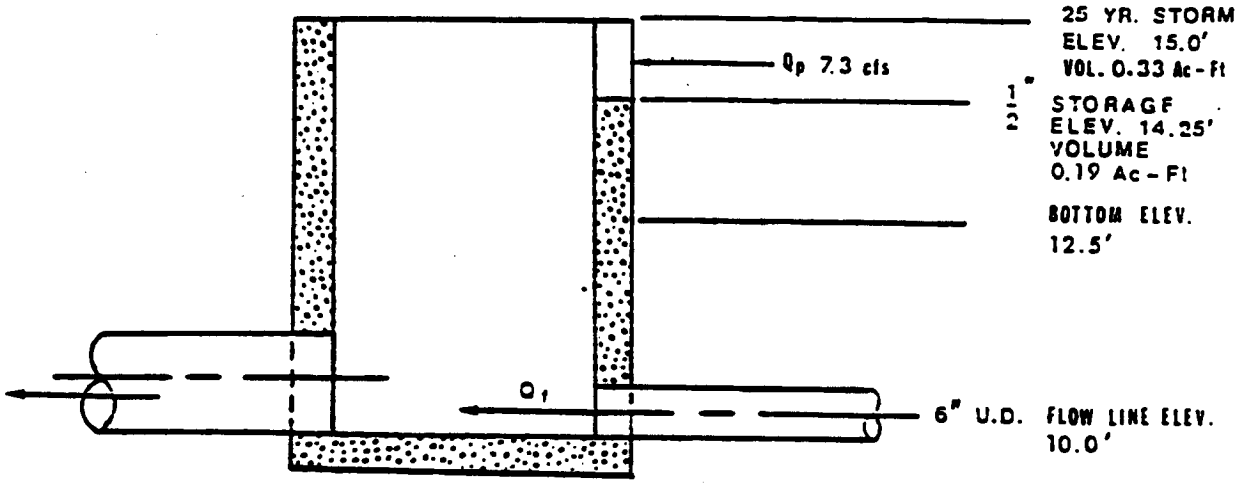


Figure 12
Outfall Structure (25 year storm)



Notes: See discussion (Section IV.) concerning weir size for definition of various symbols. Discharge to ditch then creek. Creek high water line (HWL), 25 year storm elevation, 9.7' NVGD.

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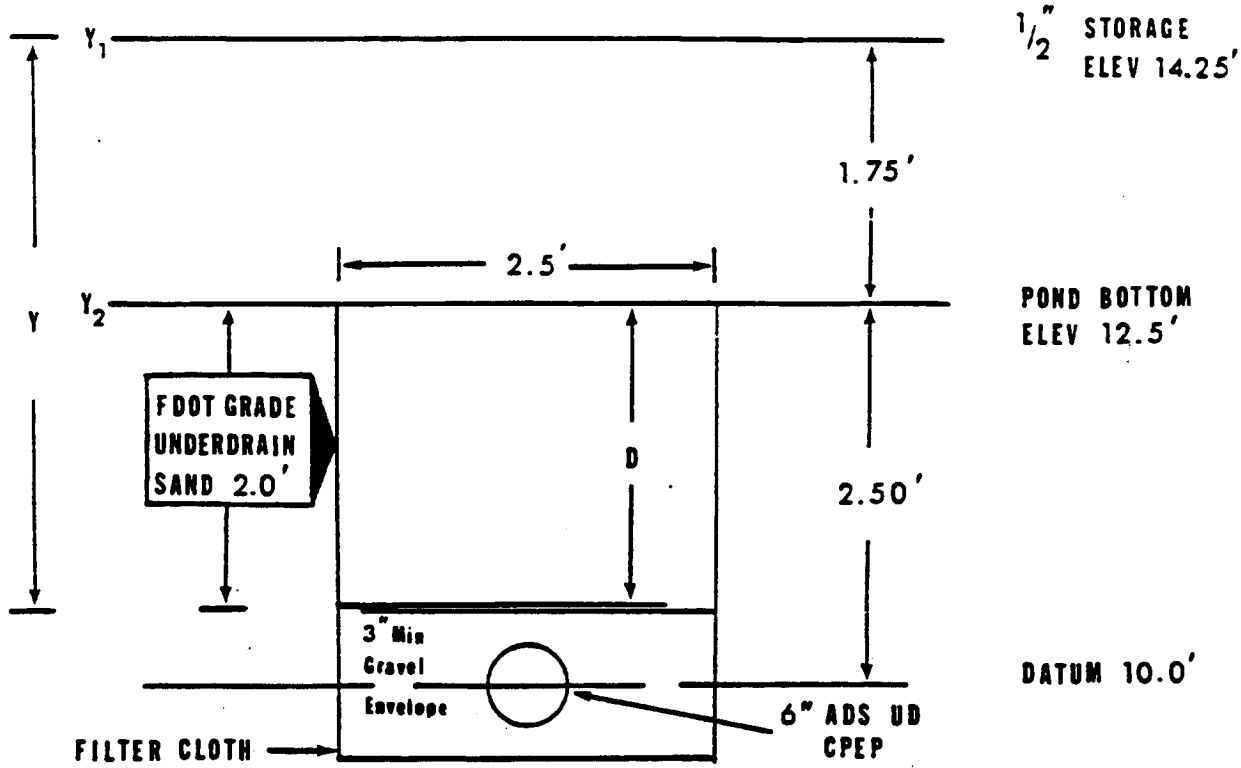
Figure-13

Typical Cross-Section of Filter Trench



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Substituting Darcy's Equation into Falling Head Equation

$$t = -\int_{Y1}^{Y2} \frac{A_R dv}{K \frac{Y}{D} A} = -\frac{A_R D}{K A} (LN\ Y_2 - LN\ Y_1) \text{ or,}$$

Equation A. 1. $$t = \frac{2.3 A_R D}{K A} \log \frac{Y1}{Y2}$$

Assumptions:

1. All discharge from the pond is through the soil within the trench.
2. Groundwater is not a contributing factor.
3. Surface area of pond is constant.

Applying equation A. 1.

$A = (2.5\ ft)(265\ ft) = 662.5\ ft^2$
$K = 1^{ft/hr}$
$D = 2.0\ ft.$
$A_r = .13\ Ac. = 5670\ ft^2$
$Y_1 = 3.75\ ft.$
$Y_2 = 2.0\ ft.$

$$t = \frac{2.3\ A_R D}{K A} \log \frac{Y_1}{Y_2} = \frac{(2.3)(5670)(2.0)}{(1)(662.5)} \log \frac{3.75}{2.0}$$

or,

$t = 10.7$ hours

$t < 72$ hours

This meets the state requirement

B. Analysis of Factor 3

Pipe perforations in the underdrain also restrict the flow of water. To compute the drawdown time based on data supplied by the manufacture, the following equation can be used:

Falling Head Equation

$$t = \int_o^t dt = -\int_{Y_1}^{Y_2} \frac{A_R\ dy}{Q}$$

Where;
t = Drawdown Time (sec.)
A_R = Average Area of Resevoir between Y_1 and Y_2 (ft^2)
C = Coefficient of Discharge
A_L = Orifice area per Linear foot of pipe (ft^2)
g = Gravitational Constant ($ft./sec^2$)

Orifice Equation

$$\frac{Q}{L} = C \frac{A_L}{L} (2gy^{1/2})$$

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L = Underdrain Length (ft.)
Y_1 and Y_2 are illustrated in Figure 13 (ft.).

Substituting the Orifice Equation into the Falling Head Equation yields;

Equation B. 1.:

$$(L)(t) = -\int_{Y_1}^{Y_2} \frac{A_R\, dv}{C\, A_L\, (2gy)^{1/2}}$$

$$= \frac{-2\, A_R}{C\, A_L\, (2g)^{1/2}} [(Y_2)^{1/2} - (Y_1)^{1/2}]$$

$$(L)(t) = \frac{2\, A_R}{C\, A_L\, (2g)^{1/2}} [(Y_1)^{1/2} - (Y_2)^{1/2}]$$

Applying Equation B. 1.

A_L = 1.78 in^2/per foot of underdrain = 0.012 ft^2/per ft. of underdrain. (Information supplied by pipe manufacture).
C = 0.60
g = 32.2 ft/sec^2
Y_1 = 3.75 ft.
Y_2 = 2.0 ft.
L = 265 ft.
A_R = .13 Ac. = 5670 ft^2

$$(L)(t) = \frac{(2)(5670)}{(0.60)(0.012)\ (64.4)^{1/2}} [(3.75)^{1/2} - (2.0)^{1/2}]$$

$$(L)(t) = \frac{11,340}{0.058} (1.94 - 1.41) = 103,624 \text{ ft.-sec.}$$

(L)(t) = 28.8 lin. ft. hrs.

Since there is 265 feet of underdrain in the system,
t = 28.8/265 or,
t = 0.11 hours
t < 72 hours

This meets state requirements. The filter media is more restrictive than the pipe perforations.

C. Analysis of Factor 4.

Underdrain size and slope can also restrict the flow of water.

As shown in Figure 13, the designer has selected six inch ADS perforated corrugated polyethylene pipe for use as the underdrain in this hypothetical situation.

To compute the drawdown time the following equation can be used:

Falling Head Equation

$$t = \int_0^t dt = -\int_{Y_1}^{Y_2} \frac{A_R\, dy}{Q}$$

t = Drawdown Time (sec)
A_R = Average Area of Resevoir between Y_1 and Y_2 (ft^2)

Mannings Equation

$$Q = \frac{1.486}{n} A_p R^{2/3} S^{1/2}$$

A_p = Pipe Area (ft^2)
R = Hydraulic Radius (ft)
S = Avg. Hydraulic Gradient $\frac{Y}{(L/2)}$ (ft./ft.)
n = Roughness Coefficient
L = Length of Underdrain (ft)

Substituting Mannings into the Falling Head Equation

$$t = -\int_{Y_1}^{Y_2} \frac{A_R\, dy}{\frac{1.486}{n} A_p R2/3 (Y/L/2)1/2}$$

$$t = -\frac{A_R\, n\, (L/2)^{1/2}}{1.486\, A_p\, R^{2/3}} \int_{Y_1}^{Y_2} Y^{-1/2}\, dy$$

Equation C. 1.:

$$t = \frac{2\, A_R\, n\, (L/2)^{1/2}}{1.486\, A_p\, R^{2/3}} \left[(Y_1{}^{1/2}) - (Y_2{}^{1/2})\right]$$

Note: Half the underdrain length was used since flow is occurring through entry points along the length of the underdrain.

Applying Equation C. 1.

$A_p = 0.196\ ft^2$
R = 0.125 ft
Y_1 = 3.75 ft
Y_2 = 2.0 ft
n = 0.015 ("n" value recommended by SCS for corrugated plastic drain tube)
A_R = .13 Ac or 5670 ft^2
L = 265 ft

$$t = \frac{(2)\ (5670)\ (0.015)\ (265/2)^{1/2}}{(1.486)\ (0.196)\ (0.125)^{2/3}} \left[(3.75^{1/2}) - (2.0^{1/2})\right]$$

t = 14,054 sec.

R0071636

t = 3.9 hours

t < 72 hours

This meets state requirements

VI. Conclusion

From the preceeding analysis, the limiting factor is the soil permeability. The drawdown time for the filter system using 265 ft. of underdrain is about 11 hours. As illustrated in steps I and II, city water quantity regulations are also satisfied. The final design consists of a dry detention area approximately 2.5 ft. deep capable of providing approximately 14,200 cubic feet of storage. The facility will cover about .13 acres of land area. A 265 ft. long by 2.5 ft. wide filter trench using 2 feet of FDOT grade underdrain sand is planned for filtration of the first 1/2 inch of runoff (8276 ft^3) entering the facility. A concrete drop inlet control structure will be utilized for flood control. The installation will include a rectangular weir or slot .75 ft. deep and 3.4 wide to limit outflow from the 25 year design storm to the predevelopment rate of discharge (7.3 cfs).

Appendix A

Derivation of the Equation for Calculating Time to 1/2" Storage Volume for Storm Duration Equal to Tc Based on Rational Method Analyses.

Assume: The 1/2" storage volume or the runoff from the first inch of rainfall (Vs) occurs sometime following Tc.

Given: Hydrograph inscribed by points abc. The value of "b" represents the peak discharge "Qp" of the inflow as measured on the left or verticle axis. The duration of the storm is equal to Tc and the base of the hydrograph is equal to 2Tc. In reference to Figure A-1; ac = ad + dc, ad = dc = Tc, Therefore, ac = 2Tc.

Question: At what point in time will the volume of inflow Vi = Vs the 1/2" storage volume or the runoff from the first inch of rainfall?

Solution: This will occur at the point where the value of the volume of storage Vs = to the total volume of inflow Vi minus the volume represented by a triangle whose base is equal to the value of (Tc - x); and, whose height (h) when divided by (Tc - x) is proportional to the value of (Qp/Tc). In other words;

$Vs = V_I - 1/2(Tc - X)(h)$ and,
referring to Figure A-1
$V_I = 1/2(2Tc)(Qp)$ or, $VI = (Tc)(Qp)$

by proportional triangles

$$\frac{h}{Tc - x} = \frac{Qp}{Tc} \quad \text{or,}$$

$$h = \frac{(Tc - x)\ (Qp)}{Tc}$$

Therefore, by substituting "h" into the first equation the total relationship may be expressed as follows:

$$Vs = (Vi) - 1/2\ (Tc - x)\ (Tc - x)\ (Qp)/Tc$$

Since $Vi = (Tc)\ (Qp)$ the equation may be simplified to read:

$$Vs = (Tc)\ (Qp) - \frac{(Tc - x)^2 (Qp)}{2Tc}$$

Rearranging and solving for the amount of time (x) past Tc in which the required storage is reached leads to the following:

$$Vs + \frac{(Tc - x)^2\ (Qp)}{2Tc} = (Tc)\ (Qp)$$

$$\frac{(Tc - x)^2 \quad (Qp)}{2Tc} = (Tc)(Qp) - Vs$$

R0071638

multiplying through by 2Tc/Qp yields;

$$(Tc - X)^2 = 2Tc^2 - \frac{2\ Vs\ Tc}{Qp}$$

$$Tc - X = \sqrt{2Tc^2 - \frac{2\ Vs\ Tc}{Qp}}$$

$$X = Tc - \sqrt{2Tc^2 - \frac{2\ Vs\ Tc}{Qp}}$$

Since the point at which the appropriate filtration volume is reach is equal to (Tc + X) as shown in Figure A-1, the time to the beginning of weir flow (t) may be calculated as follows:

$$t = Tc + (Tc) - \sqrt{2Tc^2 - \frac{2Vs\ Tc}{Qp}} \text{ or,}$$

$$t = 2Tc - \sqrt{2Tc^2 - \frac{2Vs\ Tc}{Qp}} \quad \text{Equation A-1}$$

where;

t = Time for inflow volume to reach the appropriate storage volume such that weir flow for water quantity control may begin (sec.).

Tc = Time of concentration for the watershed following development (sec.)

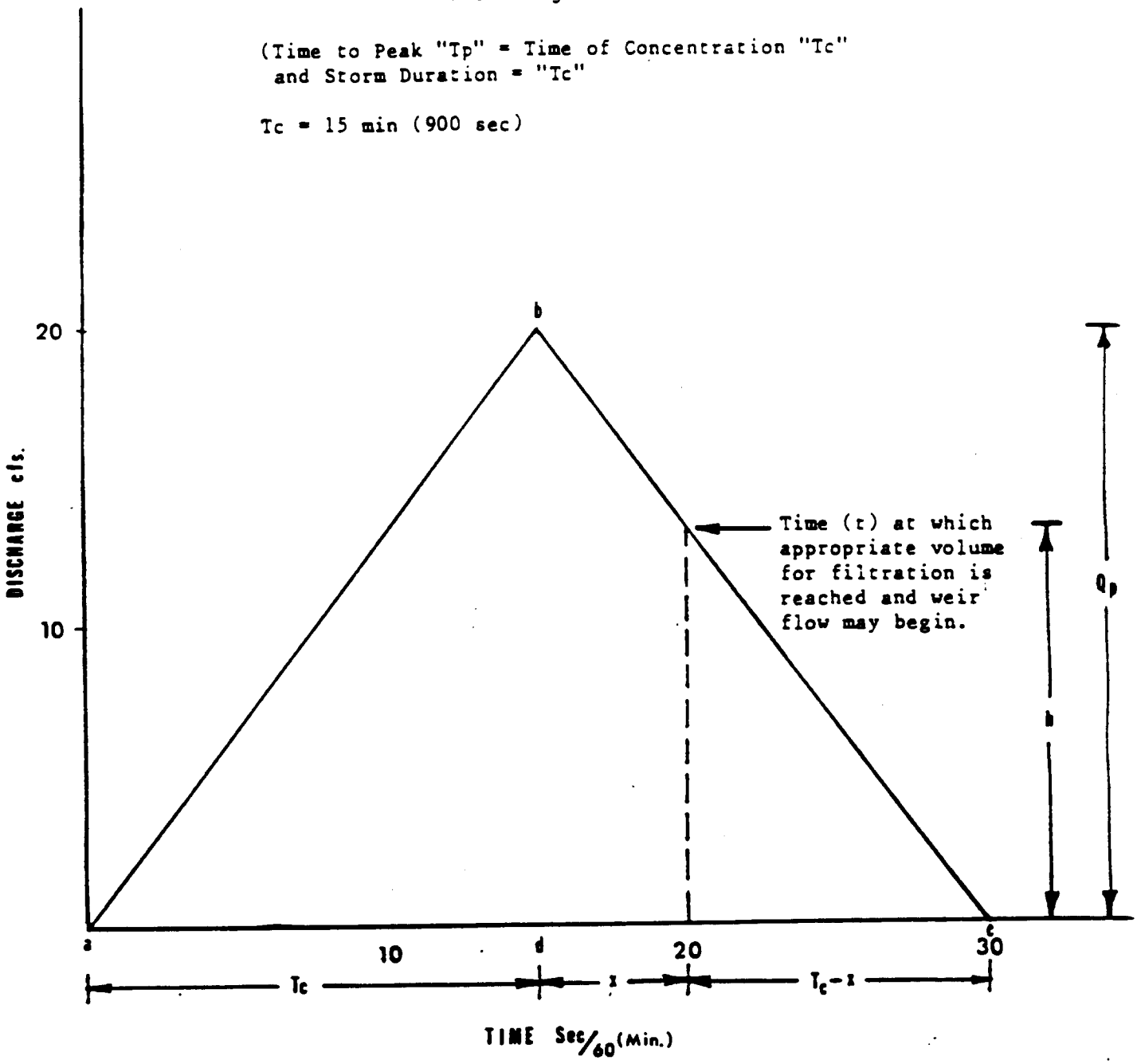
Vs = Appropriate storage filtration volume for water quality treatment as specified in rule 17-25.03(2)(b), F.A.C. (ft^3).

Qp = The peak discharge expected from the design storm with a duration equal to the time of concentration (cfs).

R0071639

Figure A-1

Typical Rational Metnoc
Hydrograph for Peak
Producing Storm



R0071640

Appendix B

Derivation of the Equation for Calculating Time to 1/2" Storage Volume for Storm Duration Greater than Tc Based on Rational Method Analyses.

Assume: The 1/2" storage volume or the runoff from the first inch of rainfall occurs sometime following Tc.

Given: Rational Method hydrograph for a storm whose duration exceeds Tc represented by the trapezoidal figure inscribed by points abcd. The value of "b" and "c" representing the peak discharge of the hydrograph as measured on the left or vertical axis may be referred to as "Qp". The duration of the storm is equal to (Tc + bc) as illustrated in Figure B-1.

Question: At what point in time will the volume of inflow Vi = Vs the appropriate storage volume to satisfy the 17-25.03(2)(b) requirments?

Solution: This will occur at the point where the value of the volume of storage Vs is equal to the volume of inflow represented by a trapezoidal figure whose base is equal to the time of concentration (Tc) plus some distance (x), whose top length is equal to (x) and whose height is equivalent to the value of (Qp) the peak discharge of the hydrograph.

In equation form the relationship may be written:

$Vs = 1/2(Tc + 2x)(Qp)$ consequently;

$$Vs - \frac{Tc\ Qp}{2} = Qp(x)$$

multiplying through by $\frac{1}{Qp}$

$$x = \frac{Vs}{Qp} - \frac{Tc}{2}$$

Since the point at which the appropriate storage volume is reached is equal to distance (Tc + x) as illustrated in Figure B-1; the time to reach the point at which weir flow may begin (t) can be calculated as follows:

$$t = Tc + \frac{Vs}{Qp} - \frac{Tc}{2} \quad \text{or,}$$

$$t = \frac{Tc}{2} + \frac{Vs}{Qp} \qquad \text{Equation B-1}$$

Where;

R0071641

t = Time for inflow to reach the appropriate storage volume such that weir flow for water quantity control may begin (sec.).

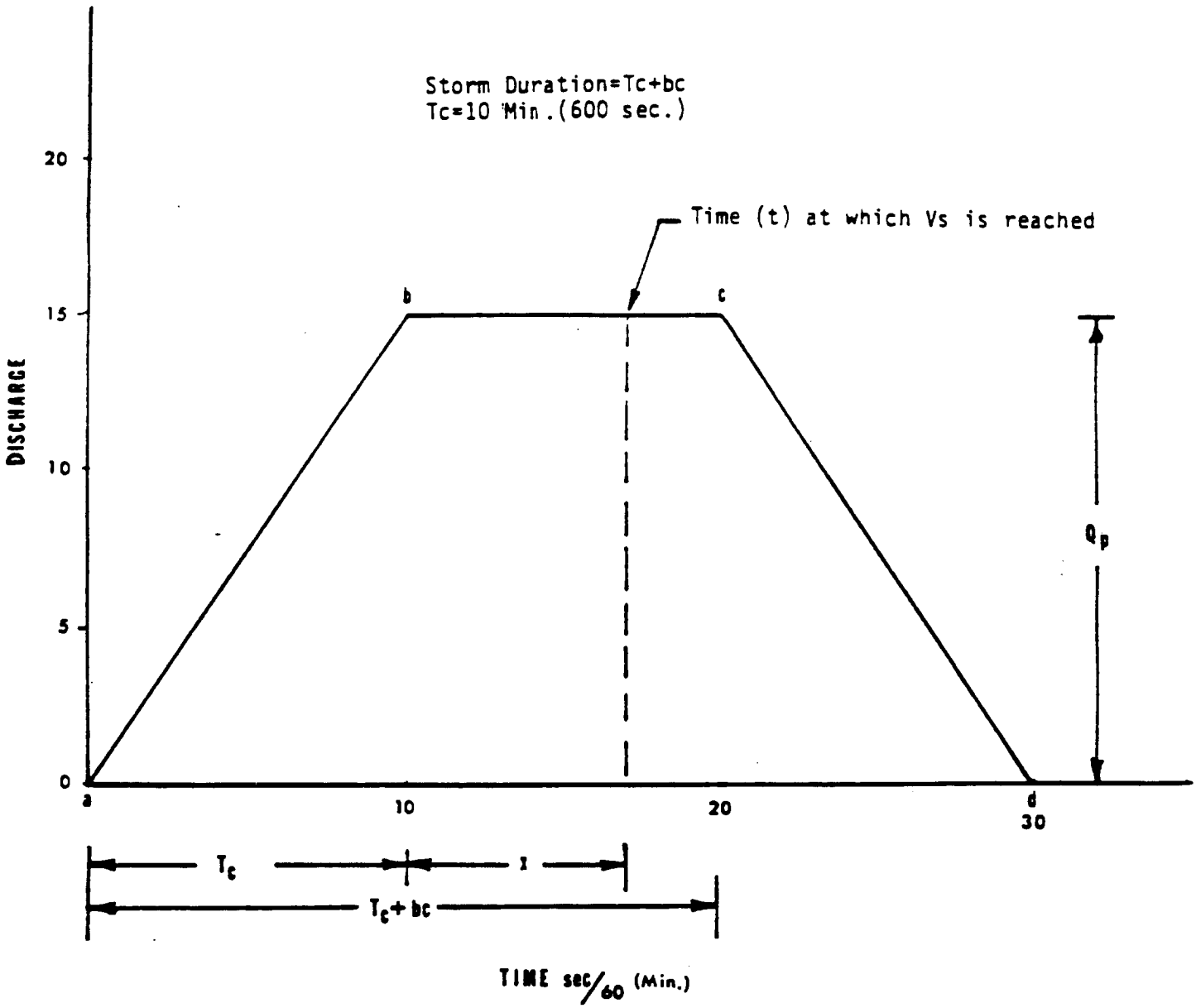
Tc = Time of concentration for the watershed following development (sec).

Vs = 1/2 inch storage volume or runoff from the first inch of rainfall for filtration as required for water quality treatment in 17-25.03(2)(b), F.A.C. (ft^3)

Qp = The peak discharge expected from the design storm for the duration under consideration (cfs).

Figure B-1

Typical Rational Method Hydrograph
for Storm Duration Greater than the
Time of Concentration "Tc"



R0071643

Appendix C

When the appropriate storage volume is achieved prior to Tc the equations shown in Appendix A and B do not apply. However, the time required for inflow to equal the required filtration volume may be determined as follows:

Given: Triangle abc as shown in Figure C-1 in which line bc represents the peak discharge (Qp) from the design storm. Line ab represents the time of concentration "Tc" which is synonomous with the time to peak of the inflow hydrograph.

Question: Assuming the volume required for filtration or storage (Vs) is known, how long from the beginning of runoff will it take for the volume of inflow (V_I) to equal the appropriate value for (Vs)?

Solution: In reference to Figure C-1, when Vs is reached prior to the peak of the inflow hydrograph, the point in time (t) wherein V_I is equal to Vs may be represented by a right triangle whose base is equal to (Tc) minus some distance (X) and whose height (H_2) is proportional to (Qp) the peak associated with triangle abc or the rising leg of the hydrograph. In equation form these relationships may be expressed as follows:

$t = Tc - x$ and, (1)

$\frac{H_2}{Tc - x} = \frac{Qp}{Tc}$ or, (2)

$H_2 Tc = Qp (Tc - x)$ (3)

We also know based on the principles of hydrograph construction that the storage or filtration volume (Vs) is represented by the area under the hydrograph at some point "y". This area may be determined by the equation:

$Vs = 1/2(Tc - X)(H_2)$ or, (4)

$2Vs = (Tc - X)(H_2)$ (5)

solving for H_2

$H_2 = \frac{2Vs}{Tc - X}$ (6)

substituting into equation three

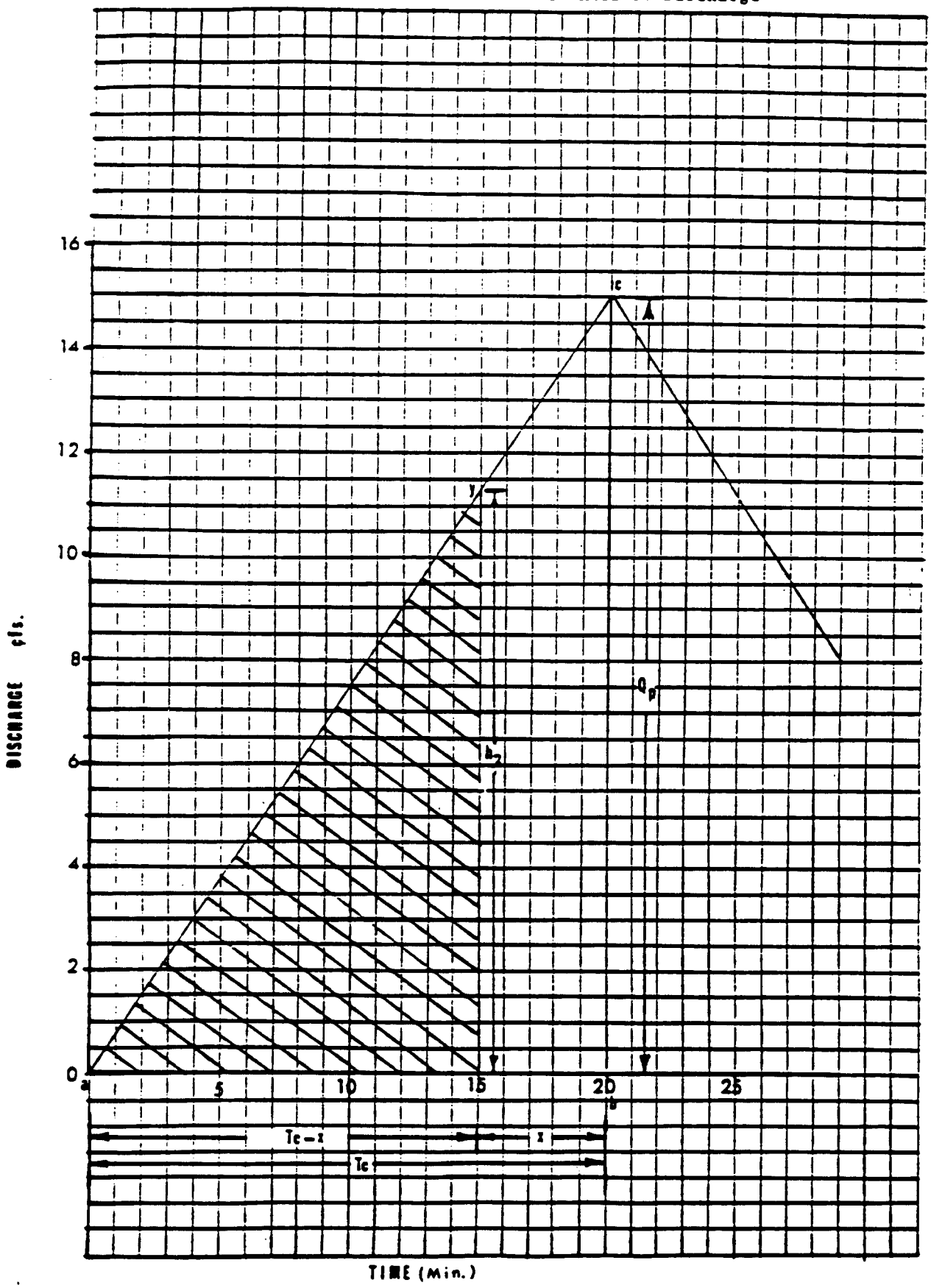
$\frac{2VS}{(Tc - X)}(Tc) = Qp(Tc - X)$ (7)

$2Vs\ (Tc) = Qp(Tc - X)^2$ (8)

$\frac{2Vs\ (Tc)}{Qp} = (Tc - X)^2$ (9)

R0071644

Figure C-1
Typical Rational Method Inflow Hydrograph Illustrating the Area Under the Curve When the 1/2 inch Storage Volume (Vs) is Reached Prior to the Peak Rate of Discharge



R0071645

Therefore;

$$(Tc - X) = \sqrt{\frac{2Vs\ (Tc)}{Qp}} \qquad (10)$$

(substituting into equation one.)

$$t = \sqrt{\frac{2Vs\ (Tc)}{Qp}} \qquad \text{Equation C-1}$$

Where:

t = Time for inflow volume to reach the appropriate storage volume and weir flow begins (sec.)

Tc = Time of concentration following development (sec.)

Vs = 1/2" storage volume or runoff from the first inch of rainfall for filtration as required in 17-25.03(2)(b) F.A.C. (ft^3)

Qp = Peak flow expected from the design storm for the duration under consideration (cfs).

APPENDIX 6-2

Discussion of Various Laboratory and Field Testing Procedures for Estimating the Hydraulic Conductivity or Coefficient of Permeability (K) of Soils and/or Filter Sands

The following exhibits are a compendium of several appendices to the design guidelines manual entitled "Underground Disposal of Stormwater Runoff", February 1980, published by the Federal Highway Administration. They have been reproduced with only minor alterations for information only with the intent of providing an aid to designers in the selection of the most appropriate testing procedure to be run. The actual test should always be conducted by professional soil scientist with experience in the proper testing procedures.

R0071647

LABORATORY PERMEABILITY METHODS

1. Constant-Head Test

In the constant-head test water flows through a test specimen under a measured hydraulic gradient (a constant amount of head is maintained) and through a known cross-sectional area (See Fig. D-3-1). Coefficient of permeability is calculated from Darcy's law arranged in the form:

$$k = \frac{q}{iA} = \frac{Q}{iAt} \qquad \text{(D-3.1)}$$

In Equation D-3.1, k is the calculated coefficient of permeability, Q is the total seepage quantity flowing in time t, $q = Q/t$ = the rate of quantity per unit of time, A is the cross-sectional area of test specimen (soil Sample) and i is the hydraulic gradient; the loss of hydraulic head per unit distance of flow, $\frac{H}{L}$.

EXAMPLE: Assume that 20 cu ft (0.56 m^3) of water flows through a test specimen with a cross-sectional area A = 1.0 sq ft (0.093 m^2), under the hydraulic gradient of 0.8, in 24 hours.

Then,

$k = q/iA$ = (20 cu ft/day)/(0.8x1.0 sq ft)

= 25 ft/day (7.63m/day)

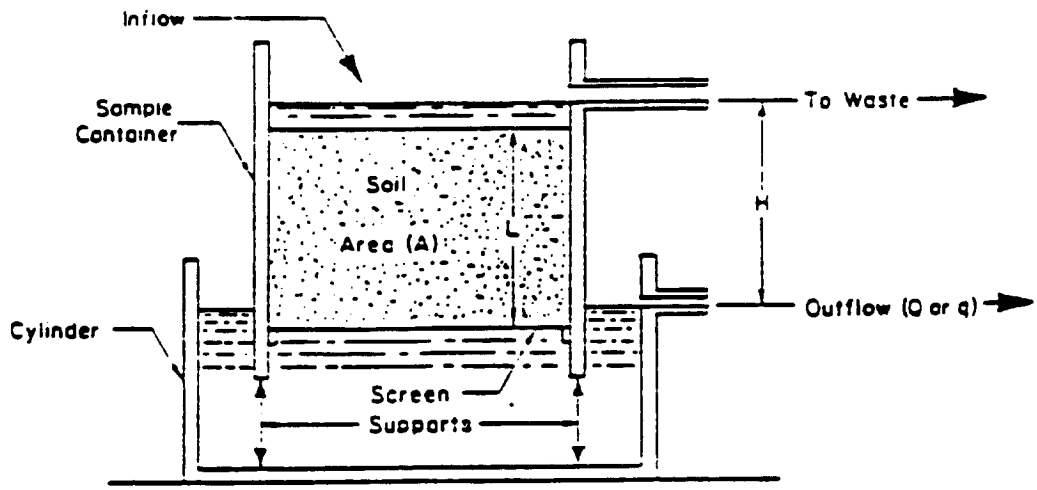


FIGURE D-3-1 CONSTANT-HEAD PERMEABILITY TEST

The constant-head test is used for determining the permeability of remolded samples of coarse-grained soils such as clean sands and gravels.

2. Falling-Head Test

In the falling-head test the amount of head inducing flow is allowed to decrease. By measuring the head at several time intervals in a small-diameter riser tube, while water is flowing through a soil specimen of greater cross-section area than the riser tube (see Fig. D-3-2), coefficient of permeability is calculated from the formula:

$$k = \frac{2.3aL}{A\,dt} \log_{10} \frac{h_o}{h_1} \qquad (D\text{-}3.2)$$

R0071649

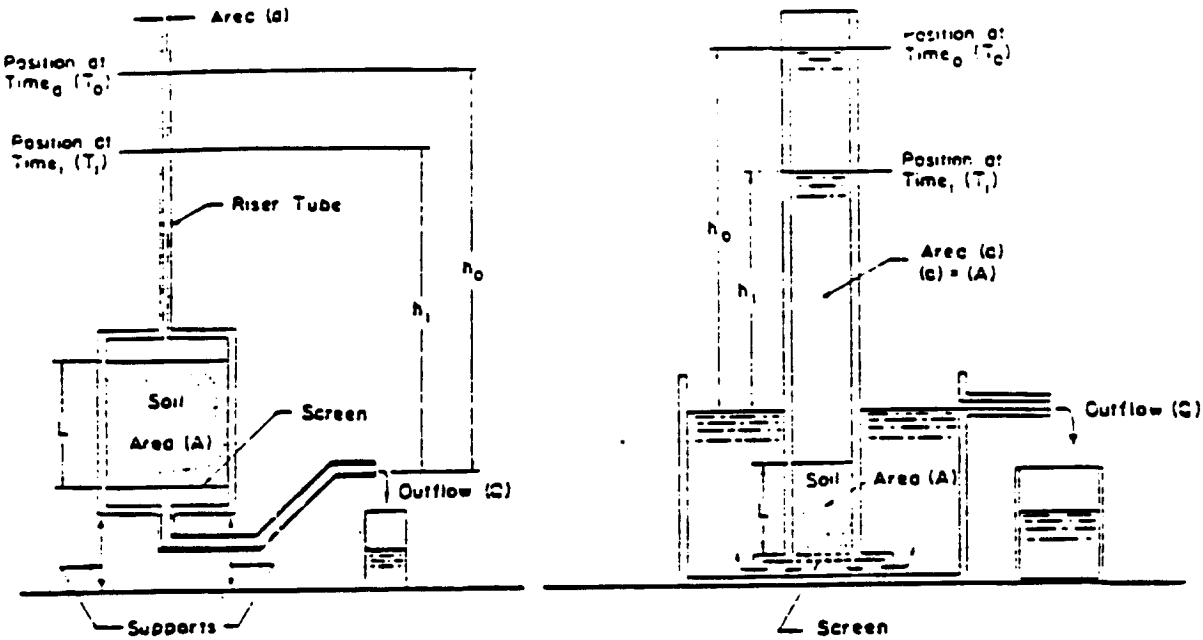


FIGURE D-3-2 FALLING HEAD PERMEABILITY TEST

In Equation D-3.2, a is the cross-sectional area of the riser tube, A is the cross-sectional area of the soil specimen, L is the length of the soil specimen, dt is the time interval during which the head drops from its initial value h_0 to some lower value, h_1.

EXAMPLE: Referring to Fig. D-3-2a, assume that h_0 = 3.0 ft (91 cm), h_1 = 2.5 ft (76 cm), dt = 6 hrs = 0.25 day, a = 0.01 sq ft (0.22 cm^2), A = 0.5 sq ft (465 cm^2), and L = 0.5 ft (15.24 cm). Using Equation D-3.2,

$$k = \frac{2.3aL}{A\,dt}\log_{10}\frac{h_0}{h_1}$$

$$= \frac{2.3(0.01)(0.5)}{0.5\ (0.25)}\log_{10}\frac{3.0}{2.5}$$

$$= (0.092)(0.079) = 0.0073 \text{ ft/day}.$$

$$(25.6\times10^{-7} \text{ cm/sec.})$$

R0071650

Figure D-3-2a and the above calculation pertain to tests on low permeability fine grained materials. If the material being tested has moderately high permeability, a falling-head test may often be made with the arrangement shown in Fig. D-3-2b, in which the cross-sectional area of the standpipe, a, is equal to the cross-sectional area of the sample, A, in Equation D-3.2. For very high permeability soils, the constant head test shown in Fig. D-3-1 is used.

In all laboratory tests, adequate precautions should be taken to minimize experimental errors. Many soil mechanics text books give the details and precautions. Generally test results are corrected to the viscosity of water at 20°C.

R0071651

FIELD PERMEABILITY METHOD FOR DESIGN
OF BASINS USING SINGLE RING TEST

Infiltration Test Specifications for Infiltration Basins with Low Water Tables (Contra Costa County Flood Control and Water Conservation District, California).

1. A 12-inch (0.304 m) diameter or larger steel pipe shall be driven into the ground a minimum distance of 12 inches (0.304 m).

2. The elevation of the ground within the pipe at the time of the test shall not vary more than one foot (0.3 m) from the final elevation of the infiltration basin.

3. A burlap sack or layer of gravel shall be placed on the soil surface within the pipe to avoid disturbance of the soil when water is poured in the pipe.

4. Water shall be put in the pipe to a depth of at least 6 inches (0.15 m) and the depth shall not exceed the depth of water in the final design of the infiltration basin. Water shall be added to the pipe when necessary to insure the ground within the pipe is always covered during the test.

5. Time measurements shall be taken for various drops in water surface within the pipe. Attached is a sample of the Infiltration Test Form (Figure D-4-1).

R0071652

6. The Infiltration Rate Curve shall be drawn using Accumulated Time from Beginning of Test in minutes as the abscissa and Infiltration Rate in inches per hour (mm/hr) as the ordinate. Refer to the typical plot on Figure D-4-2.

7. Each infiltration test shall be continuous and of sufficient duration such that the last three computed infiltration rates do not vary from each other by more than 5%.

8. A minimum of three infiltration tests shall be made for each infiltration basin and the locations of the tests shall be shown on a map.

9. The infiltration tests shall be performed under the direction of and certified by a civil engineer registered in the State of California.

10. If sufficient soil information is not available, additional soil information will be required to be furnished. This soil information shall be of the field test nature by a qualified soils technician. Depths from ground surface to beginning and end of each soil characteristic or texture shall be noted. The depth of the test hole shall not be less than six feet (1.83 m) and shall go to a depth sufficient to determine there is no layer restricting permeability.

R0071653

Single Ring Infiltration Test

Tract No. _____ Date _____

Location _____

Test No. _____ Soil Type _____ Test By _____

Time	Elapsed Time Since Last Reading (Minutes)	Depth To Water (Feet)		Intake During Period (Minutes)	Infiltration Rate Per Hour		Remarks
		Before Filling	After Filling		(Feet)	(Inches)	

FIGURE D-4-1 DATA RECORDING SHEET USED BY CONTRA COSTA COUNTY, CALIF. FOR SINGLE RING INFILTRATION TESTS

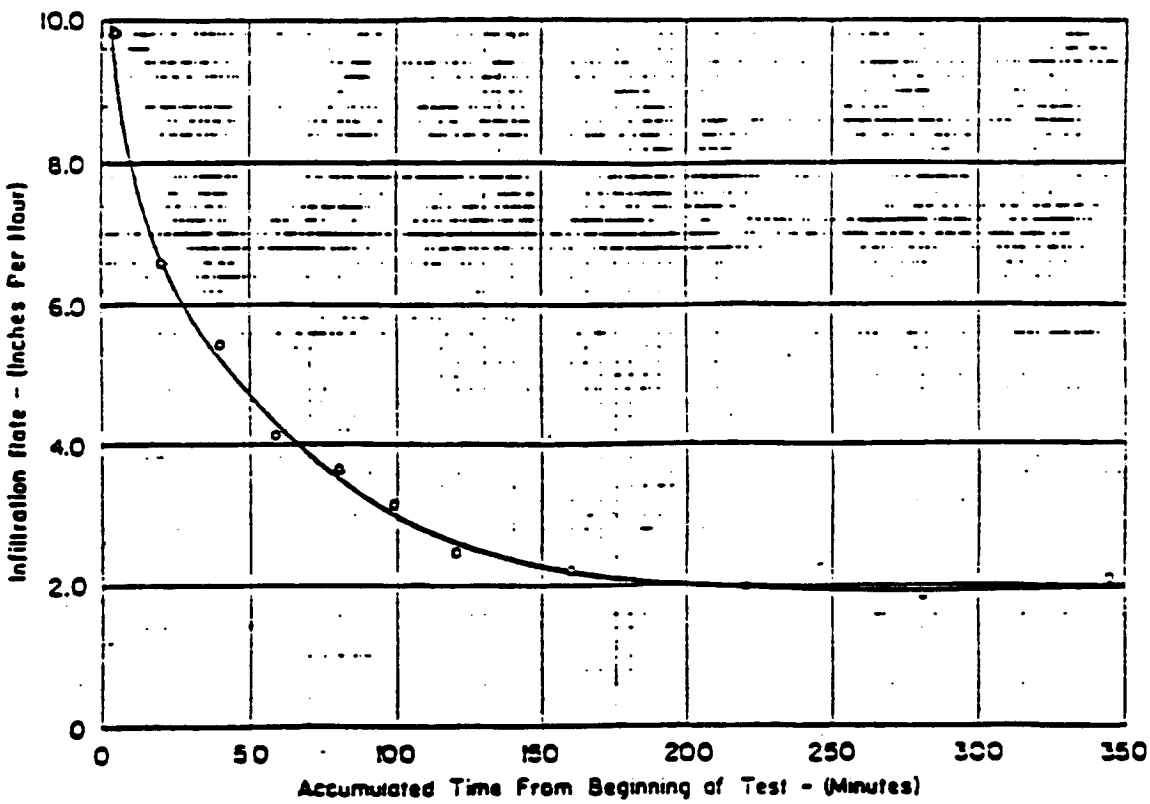


FIGURE D-4-2 TYPICAL PLOT OF TEST DATA FOR SINGLE RING INFILTRATION TEST (CONTRA COSTA COUNTY, CALIF.)

R0071654

FIELD PERMEABILITY METHOD FOR DESIGN OF BASINS USING DOUBLE RING TEST

Double Ring Method to Estimate Infiltration from Basins with Low Water Tables

At a site where an infiltration basin is planned (see Fig. D-5-1a) double-ring infiltrometer tests can be made at several locations with rings set to the planned bottom of the basin, as shown. If downward flow in the inner ring is essentially parallel, the measured infiltration rate I, can be used in estimating the drainage capability of the basin (as long as the water table is deep and the controlling flow is downward seepage, as shown in Fig. D-5-1b. For this example, the capability of the basin to discharge seepage is $Q = IA$, with Q being the capacity per day, I the vertical infiltration rate determined with the double ring infiltrometer, and A the area of the basin.

R0071655

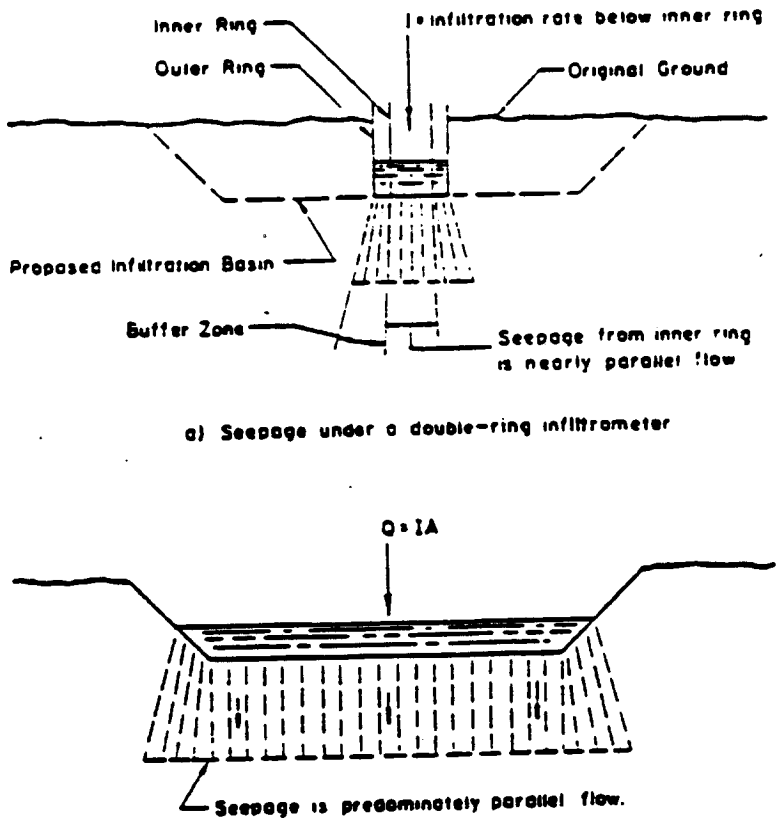


FIGURE D-5-1 DOUBLE-RING INFILTROMETER TO ESTIMATE SEEPAGE FROM INFILTRATION BASIN

AUGER HOLE TESTS

1. Variable Head Permeability Test

At selected points located within the limits of a proposed infiltration system, holes 9-inches (229 mm) in diameter or larger are bored to at least 2.5 feet (0.76 m) below the low-water elevation expected at the site, or at least 2.5 feet (0.76 m) below the existing water table, whichever is lower. The bottom 2.5 feet (0.76 m) of the hole must be kept open during a test, and if this cannot be accomplished with open auger holes, a 2-inch (50± mm) diameter wellpoint is put down or a cased hole is used. These tests, which may be called "variable head permeability tests" (U.S. Dept. of the Navy, Naval Facilities Engineering Command, 1974), offer a way of testing for the in situ permeabilities of soil formations. In making a test, the water level is either raised or lowered from the equilibrium level and allowed to recover while readings are made of water elevations versus elapsed time. Figure D-6-1.1 gives methods for analyzing the information. Table D-6-1.1 shows how to compute permeability using shape factors for various test configurations. If soils are anisotropic, a method for transforming the dimensions of the intake point of the piezometer or observation well is described in Fig. D-6-1.1. The Navy suggests that one "Assume various ratios of horizontal to vertical permeability until mean permeability determined from several piezometers is made equal". If tests are made in open-end or uncased boreholes, procedures and methods may be used as outlined in Table D-6-1.2.

R0071657

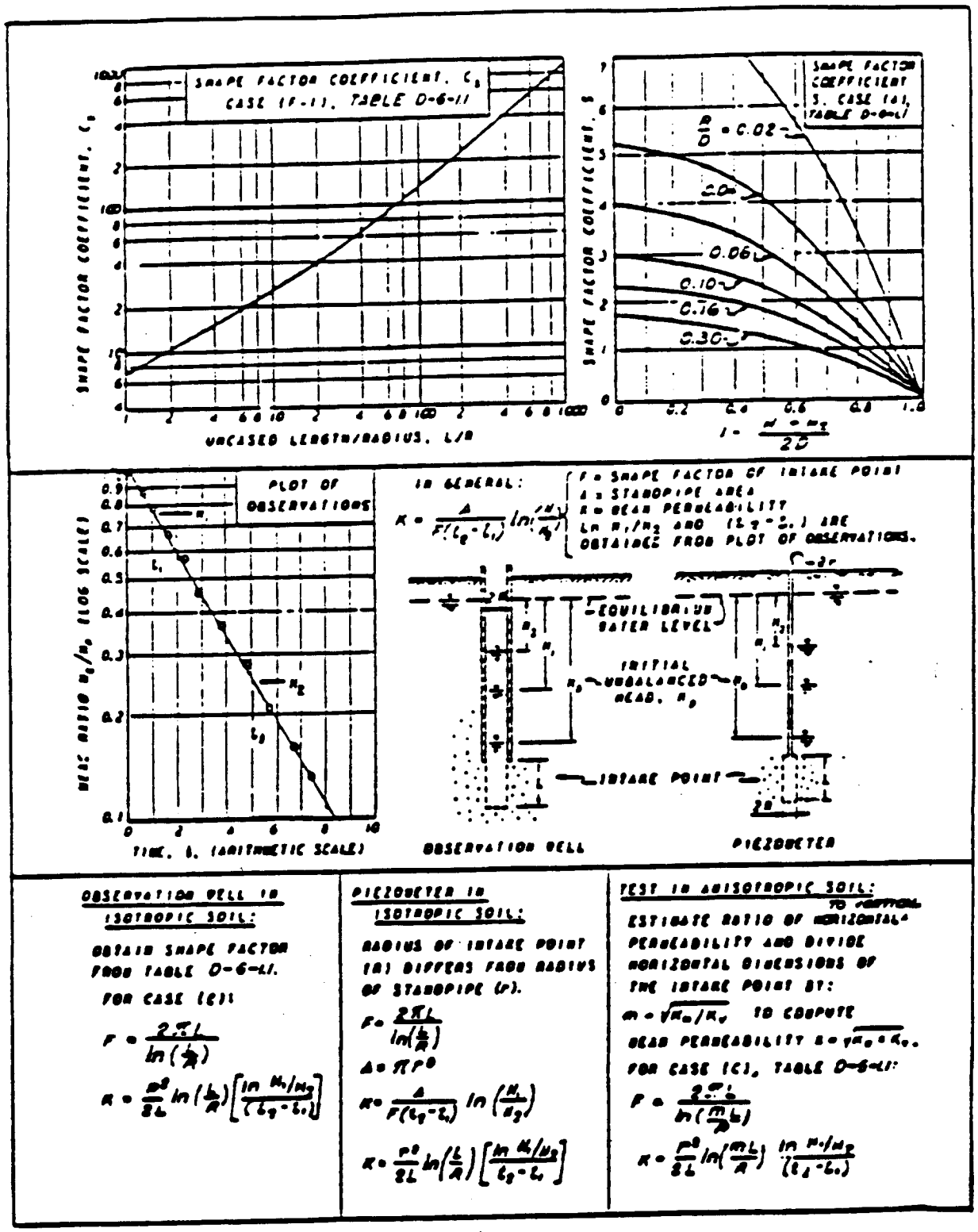
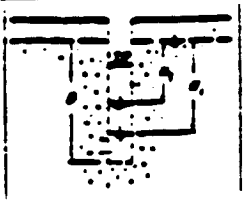
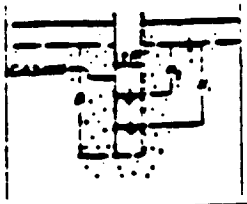
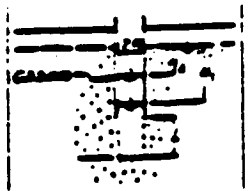
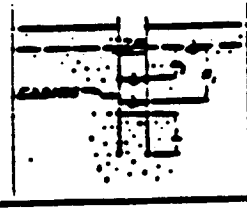
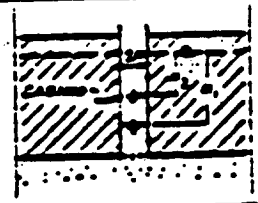
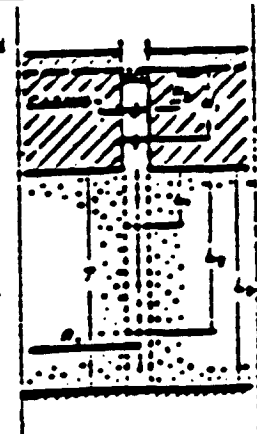


FIGURE D-6-1.1 ANALYSIS OF PERMEABILITY BY VARIABLE HEAD TESTS (NAVY, 1974)

TABLE D-6-1.1 SHAPE FACTORS FOR [illegible] PERMEABILITY FROM VARIABLE HEAD TESTS (NAVY, 1974)

	Condition	Diagram	Shape Factor, F	Permeability, K for variable head test	Applicability
OBSERVATION WELL OR PIEZOMETER IN SATURATED ISOTROPIC STRATUM OF INFINITE DEPTH	(A) Uncased hole		$F = \frac{2\pi L}{\ln(\frac{L}{r}) + A + B\frac{L}{r} - C\ln\frac{L}{r}}$	(for observation well of constant cross section) $K = \frac{r}{2L} \cdot \frac{(h_1 - h_2)}{(t_2 - t_1)}$ when $\frac{L}{r} < 50$	Summary curves for permeability determinations not applicable to stratified soils. For values of S see Fig. D-6-[illegible]
	(B) Cased hole, soil flows into casing.		$F = \frac{2\pi D}{L}$	$K = \frac{r^2 D}{2L(t_2 - t_1)} \ln(\frac{L}{r})$ when $\frac{L}{D} > 0.5$	Used for permeability determinations of small flow systems below the water table. May yield unreliable results in falling head test with silting of bottom of hole.
	(C) Cased hole, uncased or perforated extension of length "L".		$F = \frac{2\pi L}{\ln(\frac{L}{2r})}$	$K = \frac{r^2}{2L(t_2 - t_1)} \ln(\frac{L}{2r}) \ln(\frac{R}{r})$ when $\frac{L}{r} > 8$	Used for permeability determinations of greater systems below water table.
	(D) Cased hole, column of soil inside casing to height "L".		$F = \frac{\pi D^2}{2D + 4L}$	$K = \frac{D^2 \ln(2L/D)}{8L(t_2 - t_1)} \ln\frac{H_1}{H_2}$	Principal use is for permeability in vertical direction in anisotropic soils.
OBSERVATION WELL OR PIEZOMETER IN AQUIFER WITH RESERVOIRS UPPER LAYER	(E) Cased hole, casing flows with upper boundary of aquifer of infinite extent.		$F = 4R$	$K = \frac{r^2}{2R(t_2 - t_1)} \ln(\frac{H_1}{H_2})$	Used for permeability determinations where aquifer thickness is relatively thin. May yield unreliable results in falling head test with silting of bottom of hole.
	(F) Cased hole, uncased or perforated extension and aquifer of finite thickness: a) $\frac{L}{r} \geq 8.0$ b) $2.0 < \frac{L}{r} < 8.0$ c) $\frac{H}{r} < 1.00$ Note: R_e equals effective radius of aquifer at casing hole.		(1) $F = C_e R$	$K = \frac{r^2}{2C_e(t_2 - t_1)} \ln(\frac{L_e}{r})$	Used for permeability determinations of systems greater than about 5 ft. For values of C_e see Fig. D-6-[illegible]
			(2) $F = \frac{2\pi L_e}{\ln(\frac{L_e}{r})}$	$K = \frac{r^2 \ln(L_e/r)}{2L_e(t_2 - t_1)} \ln(\frac{L_e}{r})$ when $\frac{L_e}{r} > 8$	Used for permeability determinations of greater systems and for less pervious soils using pervious intake zones of considerable length.
			(3) $F = \frac{2\pi L_e}{\ln(\frac{L_e}{2r})}$	$K = \frac{r^2 \ln(\frac{L_e}{2r})}{2L_e(t_2 - t_1)} \ln(\frac{L_e}{r})$	Assume value of $\frac{R_e}{R} = 1$ for conditions where observations wells are used to determine actual value of R_e.

R0071659

TABLE D-6-1.2 MEASUREMENTS OF SOIL PERMEABILITY IN SITU (NAVY, 1974)

Property determined and name of test	Test application	Test equipment and procedure
Permeability:		
Pumping test	Applied for evaluation of problem of large scale drawdown or dewatering in materials with substantial variation in permeability.	Rate at which water is pumped from a central test well is measured while the drawdown or radial lines extending from the well is observed in a series of piezometers or observation holes. Provide 3 to 5 observation wells spaced at increasing intervals along two radial lines separated by 90 degree central angle.
Variable head test	Used to obtain individual permeability determinations in piezometers. Performed in porous tube or wellpoint piezometers which have been placed in boreholes with their intake point isolated by impervious seal.	Standpipe water level is raised or lowered from its equilibrium position and readings are taken of water levels at periodic intervals as it returns to equilibrium. Observations of differential head and time elapsed are analyzed as shown in Figure D-6-11.
Borehole test	Used to determine permeability of individual strata penetrated by borings.	May be performed in a cased, open-end borehole or an uncased borehole with double packers. Rate at which water flows out of the borehole under a constant head is measured. Use equipment and procedures of USBR Method E-18.
Auger hole test	Performed in shallow uncased auger hole. May be used in unsaturated material where the water table during testing is at a great depth below the base of hole.	Rate at which water flows out of the uncased hole is measured maintaining a constant water level in the hole. Use equipment and procedures of USBR Method E-19.

R0071660

2. Auger Hole Percolation Test of U.S. Dept of Health, Education, and Welfare

This method is described in Public Health Service Publication No. 526, "Manual of Septic-Tank Practice". It has been modified as presented below for use in determining infiltration rates for design of basins or other infiltration systems.

Percolation Tests

These percolation tests can be used to determine the acceptability of the site and establish the design size of the subsurface disposal system. The length of time required for percolation tests will vary in different types of soil. The safest method is to make tests in holes that have been kept filled with water for at least 4 hours, preferably overnight. This is particularly desirable if the tests are to be made by an inexperienced person. In some soils, such as those that swell upon wetting, it is necessary even if the individual has had considerable experience. Percolation rates should be figured on the basis of the test data obtained after the soil has had opportunity to become wetted or saturated and has had opportunity to swell for at least 24 hours. Enough tests should be made in separate holes to assure that the results are valid.

Procedure

1. Number and location of tests. - Six or more tests shall be made in separate test holes spaced uniformly over the proposed site.

2. Type of test hole. - Dig or bore a hole with horizontal dimensions of from 4 to 12 inches (0.1 to 0.3 m) and vertical sides to the depth of the proposed infiltration system. To minimize time, labor, and volume of water requirements per test, holes can be bored with a small hand auger.

3. Preparation of test hole. - Carefully scratch the bottom and sides of the hole with a knife blade or sharp-pointed instrument to disrupt any smeared soil surfaces and to provide a natural soil interface into which water may percolate. Remove all loose material from the hole. Add 2 inches (0.05 m) of coarse sand or fine gravel to protect the bottom from scouring and sediment (Fig. D-6-2.1.).

4. Saturation and swelling of the soil. - It is important to distinguish between saturation and swelling Saturation means that the void spaces between soil particles are full of water. This can be accomplished in a short period of time. Swelling is caused by intrusion of water into the individual soil particle. This is a slow process, especially in clay-type soil, and is the reason for requiring a prolonged soaking period.

In conducting the test, carefully fill the hole with clear water to a minimum depth of 12 inches (0.3 m) over the gravel.. In most soils, it is necessary to refill the hole by supplying a surplus reservoir of water, possibly by means of an automatic syphon, to keep water in the hole for at least 4 hours and preferably overnight Determine the percolation rate 24 hours after water is first added to the hole. This procedure is to insure

that the soil is given ample opportunity to swell and approach the condition it will assume during the wettest season of the year. Thus, for a particular soil, the test will give comparable results whether made in a dry or in a wet season. In sandy soils containing little or no clay, the swelling procedure is not essential, and the test may be made as described under item 5C, below, after the water from one filling of the hole has completely seeped away. Refer to Fig. D-6-2.1.

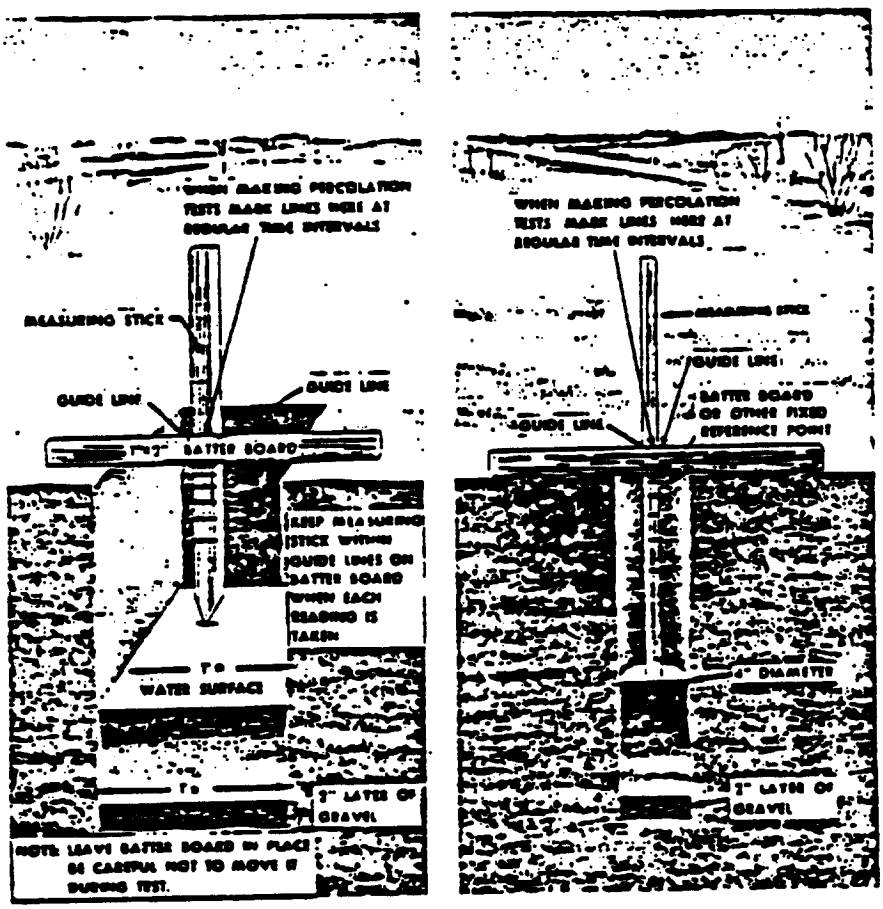


FIGURE D-6-2.1 METHODS OF MAKING PERCOLATION TESTS (FROM U.S.DEPT. OF HEW)

R0071663

5. Percolation-rate measurement. - With the exception of sandy soils, percolation-rate measurements shall be made on the day following the procedure described under item 4, above.

A. If water remains in the test hole after the overnight swelling period, adjust the depth to approximately 6 inches (0.15 m) over the gravel. From a fixed reference point, measure the drop in water level over a 30 minute period. This drop is used to calculate the percolation rate.

B. If no water remains in the hole after the overnight swelling period, add clear water to bring the depth of water in the hole to approximately 6 inches (0.15 m) over the gravel. From a fixed reference point measure the drop in water level at approximately 30 minute intervals for 4 hours, refilling 6 inches over the gravel as necessary. The drop that occurs during the final 30 minute period is used to calculate the percolation rate. The drops during prior periods provide information for possible modification of the procedure to suit local circumstances.

C. In sandy soils (or other soils in which the first 6 inches (0.15 m) of water seeps away in less than 30 minutes, after the overnight swelling period), the time interval between measurements shall be taken as 10 minutes and the test run for one hour. The drop that occurs during the final 10 minutes is used to calculate the percolation rate.

APPENDIX 6-3

Design of Exfiltration Trenches to Meet South Florida Water Management District (SFWMD) Regulatory Criteria

The following is a discussion from the SFWMD "Permit Information Manual, Volume IV," June 1986. Detailed information is provided on various field permeability testing procedures and trench design equations in order for an exfiltration system to satisfy the Districts' surface water quantity and water quality management criteria. Since SFWMD has been delegated stormwater quality permitting authority under the provisions of Chapter 17-25, F.A.C. these criteria represent the state standards pertinent to the design of these systems within the District boundaries. However, the reader should be advised that at this time, the specifications contained herein are not necessarily applicable in other areas of the State.

V. Exfiltration Trenches

A. From Paragraph 3.2.2.7 of the Basis of Review:

3.2.2.7 Underground Exfiltration Systems

a. Systems shall be designed for the retention volumes specified in Section 3.2.2.2 for retention systems, exfiltrated over one hour for retention purposes, prior to overflow, and based on test data for the site. (Note: such systems should not be proposed for projects to be operated by entities other than single owners or entities with full time maintenance staff.)

b. A safety factor of two or more shall be applied to the design to allow for geological uncertainties.

c. A dry system is one with the pipe invert at or above the average wet season water table.

Paragraph 3.2.2.2.b. is the requirement that projects with commercial or industrial zoning must provide dry pretreatment. Obviously, a project which falls into this category and is being designed to meet the criteria by using trench must have the pipe invert at or above the wet season water table. It is also a requirement that no gravity discharge from the trench system be allowed below the elevation of the top of the perforated pipe.

B. Two field test procedures for determining hydraulic conductivity will be described next. The first is the usual constant head test, the second is the falling-head test, which may be utilized in areas of excellent percolation, and when difficulty "keeping the hole filled" is encountered.

REFERENCED SECTION

3.2.2 Water quality

3.2.2.1 State standards - Projects shall be designed so that discharges will meet State water quality standards, as set forth in Chapter 17-3, Florida Administrative Code.

3.2.2.2 Retention/detention criteria

a. Retention and/or detention in the overall system, including swales, lakes, canals, greenways, etc., shall be provided for one of the three following criteria or equivalent combinations thereof (Note: Appendix 3 may be utilized where the conditions therein can be met):

1. Wet detention volume shall be provided for the first inch of runoff from the developed project, or the total runoff of 2.5 inches times the percentage of imperviousness, whichever is greater.

R0071666

2. Dry detention volume shall be provided equal to 75 percent of the above amounts computed for wet detention.

3. Retention volume shall be provided equal to 50 percent of the above amounts computed for wet detention. Retention volume included in flood protection calculations requires a demonstration of guarantees of long term operation and maintenance of system bleed-down ability. This must normally consist of proof of excellent soil percolation rates (example: coastal ridge sands) or an operations entity which specifically reserves funds for operation, maintenance and replacement (example: Orange County MSTU). (NOTE: Orange County subdivision regulation criteria for retention may be utilized for Orange County MSTU projects in lieu of District retention criteria where retention volumes exceed one half inch.)

b. Commercial or industrial zoned projects shall provide at least one half inch of dry detention or retention pretreatment as part of the required retention/detention, unless reasonable assurances can be offered that hazardous materials will not enter the project's surface water management system. Such assurances may include deed restrictions on sale property occupancy, recorded lease agreements, local government restrictive codes, ordinances, licenses, engineered containment systems, etc.

c. Systems with inlets in grassed areas will be credited with up to 0.2 inches of the required wet detention amount for the contributing areas. Full credit will be based on a ratio of 10:1 impervious area runoff to pervious area with proportional credit granted for greater ratios.

d. Projects having greater than 40% impervious area and which discharge directly to sensitive receiving water shall provide at least one half inch of dry detention or retention pretreatment as part of the required retention/detention. Sensitive receiving waters are defined as:

1. Class I or Class II waters

2. Outstanding Florida waters

3. Water bodies within a District permitted public water supply wellfield cone-of-depression which are not separated from the aquifer by strata at least ten feet thick, having an average saturated hydraulic conductivity of less than 0.1 foot per day; where the cone-of-depression is defined by one of the following: 1) in those areas of the District where no local wellfield protection ordinance has been adopted by the local governing body, the one foot drawdown line as expressed in the water table aquifer under conditions of no rainfall and 100 days of pumpage at the permitted average daily pumpage rate (where significant canal recharge is indicated, canal recharge representative of a 1 in 100 year drought will be considered). 2) Broward County Wellfield Protection Ordinance contour for Zone 3. 3) Dade County Wellfield Protection Ordinance contour showing maximum limits.

e. Water surface and roofed areas can be deducted from site areas for water quality pervious/impervious calculations.

f. Different standards may be applied to urban public highway projects.

1. Usual Condition Test

The usual test performed is an open-hole test which is either uncased or cased with fully perforated casing. The procedure is described as follows:

a. Auger a 6 to 9 inch diameter hole to a depth below the ground surface equivalent to the design depth of trench (usually 4 to 6 feet).

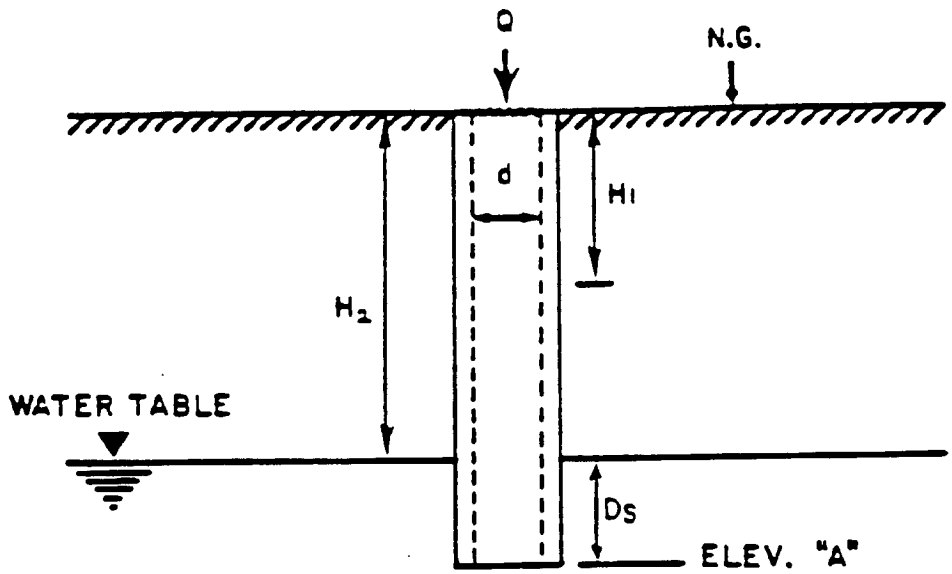
b. Record the distance from the ground surface to the water table prior to the addition of test water.

c. If hole walls are unstable lower screen or fully-perforated casing into the hole.

d. Fill hole with water and maintain water level at ground surface. Record rate of pumping in g.p.m. giving direct readings from water meter at fixed intervals of one minute or greater. Continue recording rate of pumping for 10 minutes following the stabilization of the recorded pumping rate.

Figure C-46 shows a cross-section of the test hole with a formula relating the hydraulic conductivity to the field information. The hydraulic conductivity obtained by this method may be either greater or less than the effective trench hydraulic conductivity depending upon the relative hydraulic conductivity of the surface layers.

USUAL OPEN - HOLE TEST



$$K = \frac{4Q}{\pi d(2H_2^2 + 4H_2 D_S + H_2 d)}$$

K = HYDRAULIC CONDUCTIVITY (CFS/FT.^{2} - FT. HEAD)

Q = "STABILIZED" FLOW RATE (CFS)

d = DIAMETER OF TEST HOLE (FEET)

H_2 = DEPTH TO WATER TABLE (FEET)

D_S = SATURATED HOLE DEPTH (FEET)

ELEV. "A" = PROPOSED TRENCH BOTTOM ELEV.

H_1 = AVERAGE HEAD ON UNSATURATED HOLE SURFACE (FT. HEAD)

Figure C-46

R0071669

2. Falling-head Test

The falling-head test is an open-hole test which is either un-cased or cased with fully-perforated casing. The procedure is described as follows:

a. Auger a 6 to 9 inch diameter hole to a depth below the ground surface equivalent to the design depth of the trench (usually 4 to 6 feet).

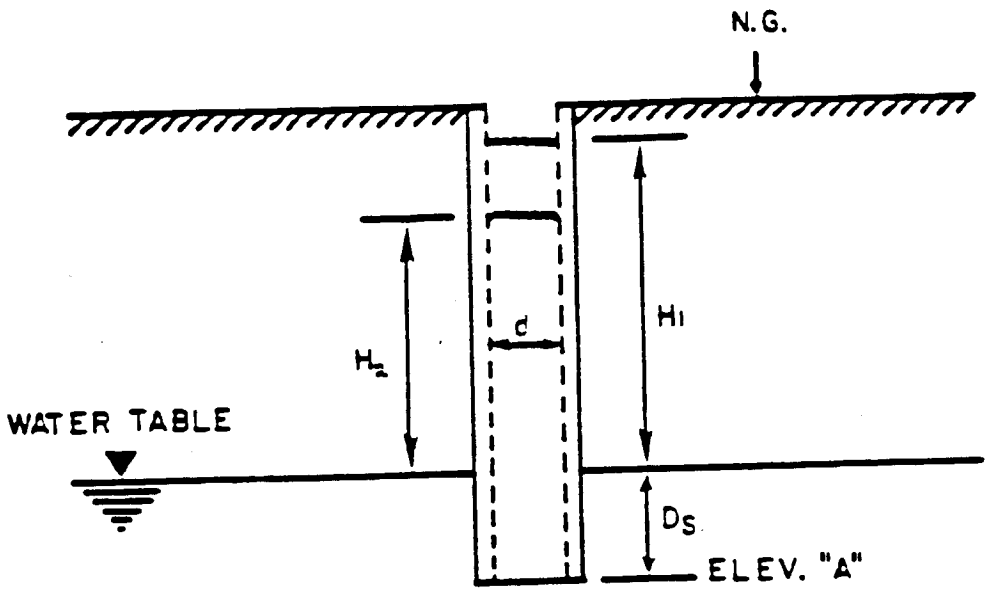
b. Record the distance from the ground surface to the water table prior to the addition of test water.

c. If hole walls are unstable lower screen or fully-perforated casing into the hole.

d. Fill hole with water and maintain water level at ground surface. Cease adding water and measure the water level versus elapsed time in equal time increments, usually in 15-second increments. Continue measuring water level until it has dropped at least half the distance to the water table.

Figure C-47 shows a cross-section of the test hole with a formula relating the hydraulic conductivity to the field information.

FALLING - HEAD OPEN - HOLE TEST



$$K = \frac{d \ln (H_1/H_2)}{(2H_1+2H_2+4D_S+d)(t_2-t_1)}$$

K = HYDRAULIC CONDUCTIVITY (CFS/FT.^{2}-FT. HEAD)

d = DIAMETER OF TEST HOLE (FEET)

H_1 = HEIGHT OF WATER IN HOLE ABOVE WATER TABLE AT TIME, t_1

H_2 = HEIGHT OF WATER IN HOLE ABOVE WATER TABLE AT TIME, t_2

D_S = SATURATED HOLE DEPTH (FEET)

ELEV. "A" = PROPOSED TRENCH BOTTOM ELEV. (FT.-NGVD)

t_1, t_2 = TIME, SECONDS

Figure C-47

R0071671

3. Analysis of Test Data

In this section actual test data which was compiled during a field test of the "usual" case will be described and the soil permeability calculated. The test was performed on a piece of property in Broward County, Florida. The test hole was 9 inches in diameter augered to a depth of 6 feet. A 9 inch diameter by 72 inch long perforated casing was set in the hole. The depth to the water table prior to introduction of test water was 5.3 feet below the ground. The field data collected during the test is shown in Table C-3.

Taking the total flow into the test hole during the 75 minute test period and dividing by 75 minutes, since there was no significant variation in flow during the test, yields an average flow rate, Q, of 3.46 g.p.m., which is equivalent to 7.71×10^{-3} cfs. The diameter of the test hole, D, was 0.75 foot. The saturated hole depth, Ds, was equal to the depth of the hole, 6 feet, minus the depth to the water table, 5.3 feet, which is equal to 0.7 foot.

Utilizing the formula from Figure C-46:

$$K = \frac{4Q}{\pi d(2H_2^2 + 4H_2D_s + H_2d)}$$

$$K = \frac{4(7.71 \times 10^{-3})}{\pi(0.75)(2(5.3)^2 + 4(5.3)(0.7) + (5.3)(0.75))}$$

$$K = \underline{1.75 \times 10^{-4} \text{cfs/ft}^2\text{ft.head}}$$

R0071672

TABLE C-3

BROWARD COUNTY - USUAL OPEN-HOLE TEST

Elapsed Time (Minutes)	Begin Meter Reading	End Meter Reading	Flow Gallons	Q (G.P.M.)
1	0.0	5.5	5.5	5.5
2	5.5	11.0	5.5	5.5
3	11.0	16.0	5.0	5.0
4	16.0	19.0	3.0	3.0
5	19.0	22.5	3.5	3.5
6	22.5	26.5	4.0	4.0
7	26.5	30.0	3.5	3.5
8	30.0	33.5	3.5	3.5
9	33.5	37.5	4.0	4.0
10	37.5	40.5	3.0	3.0
11	40.5	44.5	4.0	4.0
12	44.5	48.5	4.0	4.0
13	48.5	51.5	3.0	3.0
14	51.5	55.5	4.0	4.0
15	55.5	59.5	4.0	4.0
16	59.5	63.0	3.5	3.5
17	63.0	67.0	4.0	4.0
18	67.0	70.0	3.0	3.0
19	70.0	73.5	3.5	3.5
20	73.5	77.5	4.0	4.0
25	77.5	96.0	18.5	3.7
30	96.0	114.5	18.5	3.7
35	114.5	132.0	17.5	3.5
40	132.0	154.0	22.0	4.4
45	154.0	172.5	18.5	3.7
50	172.5	190.5	18.0	3.6
55	190.5	208.5	18.0	3.6
60	208.5	220.0	11.5	2.3
65	220.0	235.0	15.0	3.0
70	235.0	247.0	12.0	2.4
75	247.0	259.5	12.5	2.5

R0071673

4. Design of Trenches

Since the first publication of Volume IV, Permit Information Manual additional consideration has been given to the derivation of an acceptable exfiltration trench design formula. The latest development is shown on Figure C-48 along with the description of the appropriate parameters. The derivation of this trench sizing formula is given in the Appendix along with the derivations of the formulae used for use with the field testing procedures.

An example of the use of this formula with the data from the Broward County test site follows:

$$L = \frac{CAR}{K(H_2W + 2H_2Du - Du^2 + 2H_2D_s) + (1.39 \times 10^{-4})WDu}$$

C = 0.60

A = 10.0 Acres

R = 2.5 Inches

K = 1.75×10^{-4} CFS/FT.^{2}-FT.HEAD

H_2 = 5.0 Feet (Design Condition)

W = 4.0 Feet

D_u = 2.5 Feet

D_s = 1.5 Feet

H = $D_u + D_s$ = 4.0 Feet

Solving for L gives,

L = 1389 feet of 4' x 4' exfiltration trench.

This formula can be used for sizing exfiltration trenches to meet SFWMD criteria as it is since it already takes into consideration both a Safety Factor of 2 and the 50% credit for retention systems as opposed to detention systems.

R0071674

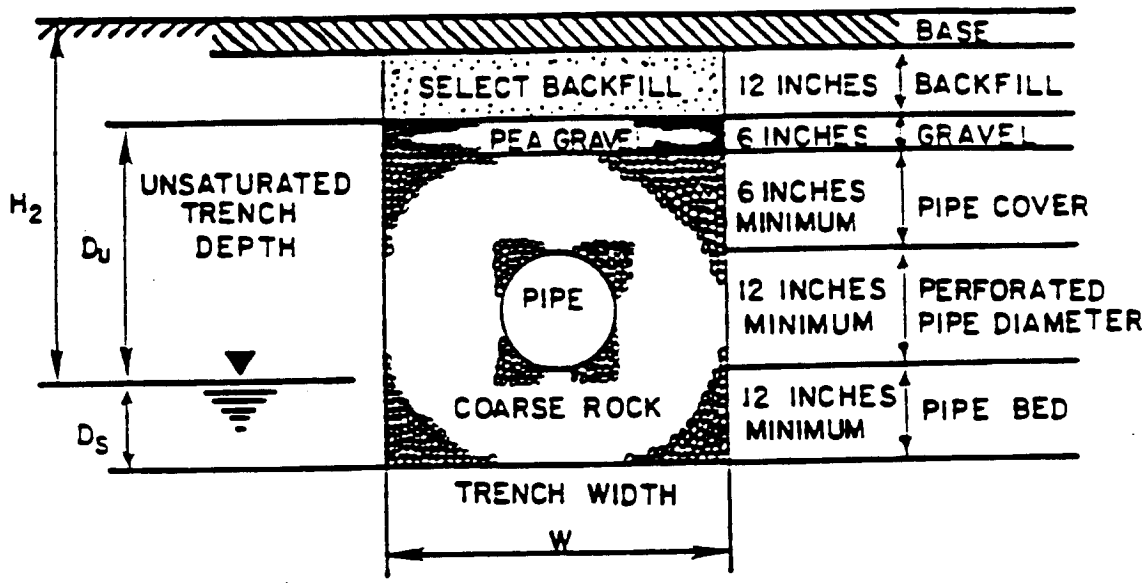
For those situations when either: (1) the saturated depth of trench is greater than the non-saturated depth of trench; or (2) the trench width is greater than two times the total trench depth, the proportional assumptions for flow out the trench bottom are probably not valid. A conservative design formula for use in these cases would be:

$$L = \frac{CAR}{K(2H_2Du - Du^2 + 2H_2Ds) + (1.39 \times 10^{-4})WDu}$$

As with any design method a good amount of engineering judgement must be applied for use on site-specific cases.

R0071675

TYPICAL EXFILTRATION TRENCH



$$L = \frac{CAR}{K(H_2W + 2H_2Du - Du^2 + 2H_2Ds) + (1.39 \times 10^{-4})WDu}$$

L = LENGTH OF TRENCH REQUIRED (FEET)

C = RUNOFF COEFFICIENT (RATIONAL RUNOFF METHOD)

A = CONTRIBUTING AREA (ACRES)

R = ONE-HOUR DESIGN RAINFALL (INCHES)

W = TRENCH WIDTH (FEET)

K = HYDRAULIC CONDUCTIVITY (CFS/FT.^{2}-FT.HEAD)

H_2 = DEPTH TO WATER TABLE (FEET)

Du = NON-SATURATED TRENCH DEPTH (FEET)

D_S = SATURATED TRENCH DEPTH (FEET)

Figure C-48

R0071676

APPENDIX

DERIVATION OF EQUATIONS

R0071677

I. USUAL OPEN-HOLE TEST

$$K = \frac{Q}{S_1 H_1 + S_2 H_2} \qquad \text{(EQ. 1)}$$

FROM FIGURE C-46:

H_2 = DEPTH TO WATER TABLE (FT.)
D_S = SATURATED DEPTH OF HOLE (FT.)
d = DIAMETER OF HOLE (FT.)

$S_1 = H_2 \pi d$ (EQ. 2)

$S_2 = D_S \pi d + \frac{1}{4} \pi d^2$ (EQ. 3)

$H_1 = \frac{1}{2} H_2$ (EQ. 4)

SUBSTITUTING INTO EQUATION 1:

$$K = \frac{Q}{\left[(H_2 \pi d)(\frac{1}{2} H_2) + (D_S \pi d + \frac{1}{4} \pi d^2)(H_2)\right]}$$

$$K = \frac{4Q}{\pi d (2H_2^2 + 4H_2 D_S + H_2 d)} \qquad \text{(EQ. 5)}$$

R0071678

II. FALLING-HEAD OPEN-HOLE TEST

$$Q = KSH \qquad \text{(EQ. 1)}$$

WHERE, Q = AVERAGE FLOW RATE (CFS)
K = HYDRAULIC CONDUCTIVITY (CFS/FT.^{2} - FT. HEAD)
S = SURFACE AREA OF HOLE (FT.^{2})
H = HEAD ON SURFACE AREA OF HOLE (FT. HEAD)

AND

$$Q = -\frac{\pi d^2}{4}\frac{dH}{dt} \qquad \text{(EQ. 2)}$$

Q = AVERAGE FLOW RATE (CFS)
d = DIAMETER OF HOLE (FEET)
dH = CHANGE IN HEAD (FT. HEAD)
dt = CHANGE IN TIME (SECONDS)

EQUATING EQ. 1 AND EQ. 2:

$$KSH = -\frac{\pi d^2}{4}\frac{dH}{dt} \qquad \text{(EQ. 3)}$$

$$\frac{4KS}{\pi d^2}\,dt = -\frac{dH}{H}$$

$$\int_{t_1}^{t_2} \frac{4KS}{\pi d^2}\,dt = \int_{H_1}^{H_2} -\frac{dH}{H}$$

$$\frac{4KS}{\pi d^2}(t_2 - t_1) = \ln(H_1/H_2)$$

$$K = \frac{\pi d^2 \ln(H_1/H_2)}{4S(t_2 - t_1)} \qquad \text{(EQ. 4)}$$

S = SURFACE AREA OF HOLE, EFFECTIVE (FT.^{2})

$$S = \pi dL + \frac{1}{4}\pi d^2$$

$$L = \frac{(H_1+H_2)}{2} + Ds \qquad \text{(SEE FIGURE C-47)}$$

$$S = \pi d\left[\frac{H_1+H_2}{2} + Ds\right] + \frac{1}{4}\pi d^2$$

R0071679

$$K = \frac{\pi c^2 \ln(H_1/H_2)}{4\left[\pi d\left[\frac{(H_1+H_2)}{2}+D_s\right]+\frac{1}{2}\pi c^2\right](t_2-t_1)}$$

$$K = \frac{d \ln(H_1/H_2)}{(2H_1+2H_2+4D_s+d)(t_2-t_1)} \qquad \text{(EQ. 5)}$$

R0071680

III. TRENCH LENGTH EQUATION

A. VOLUME OF RUNOFF:

$$C = CAR\left(\frac{43560}{12}\right) = 3630\,CAR\ (FT.^3) \qquad (EQ.\ 1)$$

WHERE,

C = RATIONAL METHOD RUNOFF COEFFICIENT
A = DRAINAGE AREA (ACRES)
R = ONE-HOUR RAINFALL (INCHES)

B. VOLUME OF STORAGE IN TRENCH:

BASED ON 50% VOIDS:

$$V_{STOR} = 0.50\,WD_uL\ (FT.^3) \qquad (EQ.\ 2)$$

WHERE,

W = TRENCH WIDTH (FT.)
D_u = UNSATURATED TRENCH DEPTH (FT.)
L = TRENCH LENGTH (FT.)

C. VOLUME EXFILTRATED:

$$V_{BOT} = KH_2WL(3600) \qquad (EQ.\ 3)$$

WHERE,

V_{BOT} = VOLUME EXFILTRATED OUT BOTTOM IN 1 HOUR ($FT.^3$)
K = HYDRAULIC CONDUCTIVITY (CFS/$FT.^2$ - FT. HEAD)
H_2 = HEAD ON SATURATED SURFACE (FT. HEAD)

AND:

$$V_{SIDE} = L(KS_1H_1 + KS_2H_2)\,3600 \qquad (EQ.\ 4)$$

WHERE,

V_{SIDE} = VOLUME EXFILTRATED OUT A SIDE IN 1 HOUR ($FT.^3$)
S_1 = UNSATURATED TRENCH SURFACE ($FT.^2$)
S_2 = SATURATED TRENCH SURFACE ($FT.^2$)
H_1 = AVERAGE HEAD ON UNSATURATED SURFACE (FT. HEAD)
H_2 = HEAD ON SATURATED SURFACE (FT. HEAD)

FROM FIGURE C-48

$S_1 = D_u L$

$S_2 = D_s L$

$H_1 = H_2 - \frac{1}{2} D_u$

THEN:

$$V_{SIDE} = \left[K D_u L (H_2 - \tfrac{1}{2} D_u) + K D_s L H_2 \right] 3600$$

$$V_{SIDE} = 3600 K L (H_2 D_u - \tfrac{1}{2} D_u^2 + H_2 D_s) \qquad \text{(EQ. 5)}$$

SETTING THE VOLUME OF RUNOFF EQUAL TO THE VOLUME EXFILTRATED: $Q = V_{STOR} + V_{BOT} + 2V_{SIDE}$

$$3630 CAR = 0.50 W D_u L + 3600 K H_2 W L + 2\left[3600 K L (H_2 D_u - \tfrac{1}{2} D_u^2 + H_2 D_s)\right]$$

SOLVING THIS EQUATION FOR L:

$$L = \frac{1.00834 CAR}{K(H_2 W + 2 H_2 D_u - D_u^2 + 2 H_2 D_s) + 0.000139 W D_u} \qquad \text{(EQ. 6)}$$

HOWEVER, CONSIDERING THE EFFECT ON THE ANSWER AND THE NORMAL VARIATIONS IN ESTIMATION OF C WE HAVE SIMPLIFIED THE EQUATION TO READ:

$$L = \frac{CAR}{K(H_2 W + 2 H_2 D_u - D_u^2 + 2 H_2 D_s) + (1.39 \times 10^{-4}) W D_u} \qquad \text{(EQ. 7)}$$

WHERE,

- L = LENGTH OF TRENCH REQUIRED (FT.)
- C = RATIONAL METHOD RUNOFF COEFFICIENT
- A = DRAINAGE AREA (ACRES)
- R = ONE-HOUR RAINFALL (INCHES)
- H_2 = DEPTH TO WATER TABLE (FT.)
- W = TRENCH WIDTH (FT.)
- D_u = UNSATURATED TRENCH DEPTH (FT.)
- D_s = SATURATED TRENCH DEPTH (FT.)

R0071682

FOR A DISTRICT AVERAGE 3-YEAR, 1-HOUR RAINFALL OF 2.5 INCHES THIS EQUATION BECOMES, SIMPLY:

$$L = \frac{2.5CA}{K(H_2W + 2H_2Du - Du^2 + 2H_2D_s) + (1.39 \times 10^{-4})WDu} \qquad \text{(EQ. 8)}$$

R0071683

DESIGN EXAMPLE

FOR

EXFILTRATION TRENCH

R0071684

I. Given:

A. Proposed acreages

1. Lake = 1 ac
2. Roofs = 5 ac
3. Other paving = 8 ac
4. Green areas = 2 ac
5. Total = 16 ac

B. Other

1. An existing canal, along one border of the property, will be the receiving body.
2. The receiving body regulated stage is elevation 8.0' NGVD.
3. The existing average site grade is about elevation 17' NGVD.
4. The site soil drains well. Three percolation tests yield an average hydraulic conductivity of

$$1.2 \times 10^{-4} \text{ cfs/(sq ft - ft of head)}.$$

5. Average wet season water table elevation is 8.25' NGVD.
6. Current zoning is "Commercial".

II. Design Criteria

A. Quality

1. If a wet detention system, then whichever is the greater of
   a. The first inch of runoff from the entire site.
   b. The amount of 2.5 in. times the percentage of impervious.
2. If a dry detention system, then 75% of the volume required for wet detention.
3. If a retention system, then 50% of the volume required.
4. Because the site zoning is "Commercial", at least 0.5 in. of retention or dry detention pretreatment shall be provided.

R0071685

5. Any detention system shall be designed to discharge not more than 0.5 in. of the detained volume per day. A V-shaped configuration is desirable.

B. Quantity

1. The allowable discharge for the basin in which this project is located is 50 csm for a 25-year 3-day storm.

2. First floors are desired to be no lower than elevation 18.5' NGVD.

3. Parking areas.

a. Are proposed to range in elevation from 16.0' to 17.5' NGVD.

b. Shall be at least 2 ft above the control elevation.

III. Computations

A. Quality

1. Compute the first inch of runoff from the entire developed site.

= 1 in. x 16 ac x 1 ft/12 in.

= 1.3 ac-ft for the first inch of runoff.

2. Compute 2.5 in. times the percentage of imperviousness.

a. Site area, for water quality pervious/impervious calculation only

= Total project - (lake + roof)

= 16 ac - (1 ac + 5 ac)

= 10 ac site area, for water quality pervious/impervious.

b. Impervious area, for water quality pervious/impervious calculations only

= (Site area for water quality pervious/impervious) - pervious

= 10 ac - 2 ac

= 8 ac impervious area, for water quality pervious/impervious.

R0071686

c. Percentage of imperviousness for water quality.

= Impervious area for water quality / Site area for water quality x 100%

= (8 ac/10 ac) x 100%

= 80% impervious

d. For 2.5 in. times the percentage impervious

= 2.5 in. x 0.80

= 2.00 in. to be treated

e. Compute volume required for quality detention

= inches to be treated x (total site - lake)

= 2.00 in. x (16 ac - 1 ac) x 1 ft/12 in.

= 2.00 in. x 15 ac x 1 ft/12 in.

= 2.5 ac-ft required detention storage

3. Since the 2.5 ac-ft are greater than the 1.3 ac-ft computed for the first inch of runoff, the volume of 2.5 ac-ft controls. (The system proposed is wet detention, so no volume reductions are possible.)

4. Because this is a project on commercial zoned land, 0.5 in. of dry retention/detention must be provided.

= 0.5 in. x (total site - lake)

= 0.5 in. x (16 ac - 1 ac) x 1 ft/12 in.

= 0.6 ac-ft required for pretreatment

5. Compute credit for placing some system inlets in grassed swales.

a. Given:

i. Each inlet in a grassed swale drains about 0.75 acre.

ii. A typical grassed swale will consist of an area about 15 ft long and 5 ft wide. The inlet will be considered a negligible part of the area.

iii. No other pervious areas drain into the grassed swale.

b. Compute ratio of impervious to pervious area.

i. Pervious area

= 15 ft x 5 ft

= 75 sq ft pervious area.

ii. Impervious area

= 0.75 ac x 43,560 sq ft/ac

= 32,670 sq ft impervious area.

iii. Compute Impervious : Pervious ratio

= 32,670 sq ft : 75 sq ft

= 436:1

A ratio of 436:1 results in negligible credit.

6. It is proposed that the dry pretreatment be accomplished totally by exfiltration trench, and to utilize the lake for aesthetics and wet detention. Since the system should be designed to maintain the water table no more than 6 feet below natural ground, and the average site grade is at elevation 17' NGVD, the control elevation shall be 11.0' NGVD. (Note: existing water table elevation is 8.25' NGVD.)

7. Compute volume to be treated in the lake

= Total Quality Volume - Dry Pretreatment Volume

= 2.5 ac-ft - 0.6 ac-ft

= 1.9 ac-ft to be detained in the lake.

B. Trench

1. Design Criteria

a. A minimum of 2 ft of paving and backfill will be required above the trench.

b. Minimum parking area elevation is 16.0' NGVD.

c. Trench width shall be 3 ft.

d. Since control elevation is 11.0' NGVD and existing wet season water table is 8.25' NGVD, assume the water table in the vicinity of the trench to be at elevation 10.5' NGVD.

e. For trench to be considered dry, the water table must be no higher than the invert of the trench pipe. For this system, the trench bed will extend down to elevation 11' NGVD. The pipe invert will be at elevation 12' NGVD.

2. Compute trench length

a. $L = 3630\ V/(K(H_2W + 2H_2Du - Du^2 + 2H_2D_s) + (1.39 \times 10^{-4})WDu)$

L = Length of trench required (feet)

V = Volume to be exfiltrated (ac-in.)

W = Trench width (feet)

K = Hydraulic conductivity (cfs/sq ft - ft head)

H_2 = Depth to water table (feet)

Du = Non-saturated trench depth (feet)

D_s = Saturated trench depth (feet)

b. In this project, L is to be determined

$V = 0.6$ ac-ft $= 7.2$ ac-in.

$W = 3$ ft

$K = 1.2 \times 10^{-4}$ cfs/(sq ft - ft of head)

*$H_2 = 5$ ft

**$Du = 3$ ft

$D_s = 0$

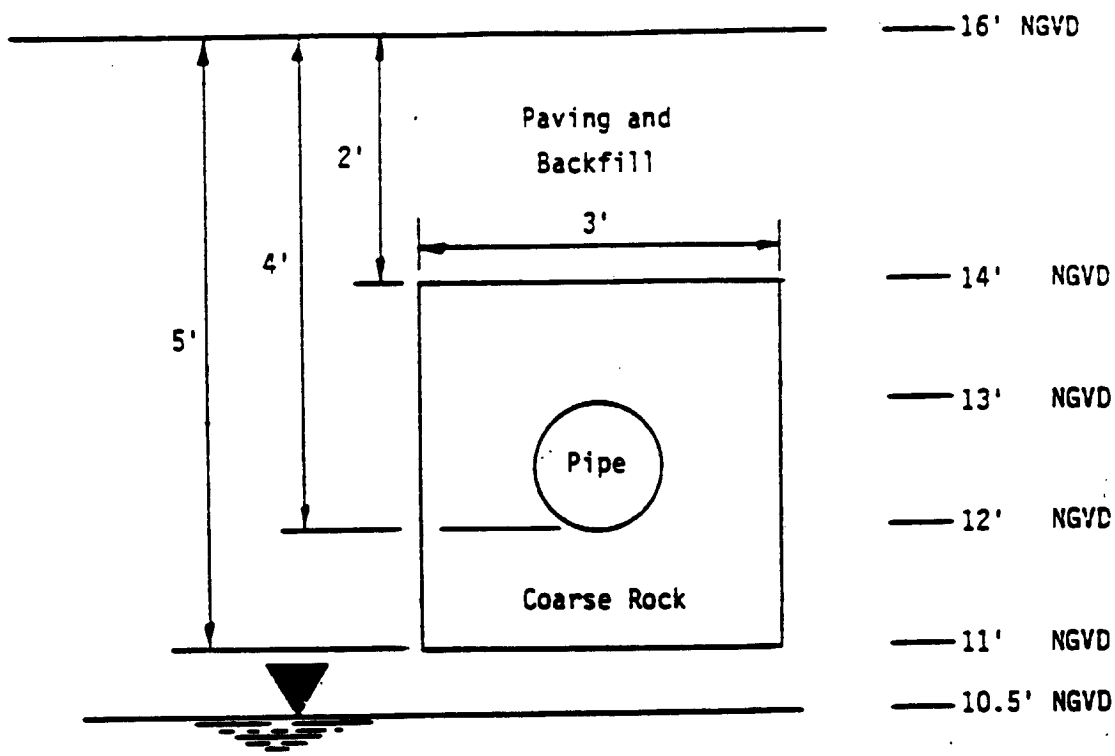
*H_2 can extend no lower than the trench bottom.

**Du is the entire trench depth, from elevations 11 to 14' NGVD, because the water table is below the trench bottom.

c. $$L = \frac{7.2}{1.2\times10^{-4}\times((5\times3)+(2\times5\times3)-(3\times3)+(2\times5\times0))+((1.39\times10^{-4})\times3\times3)}$$

= 1,290, say, <u>1,300 l.f.</u> of trench for dry retention.

R0071689



CROSS SECTION OF PROPOSED EXFILTRATION TRENCH

Figure D-E-1

R0071690

C. Other considerations

1. A weir must be installed at the downstream end of the trench system, to create true retention. The crest of the weir must be no lower than the top of the trench pipe.

2. The proposed lake-trench system should be checked to be certain it provides adequate storage for road and parking lot protection, can meet design storm discharge criteria, and can provide adequate floor protection. This would include a control structure on the lake discharge route.

R0071691

APPENDIX 6-4

Design Charts for Determining Waterway Capacity

(By the Soil Conservation Service)

Exhibits 7-4 and 7-5 have been prepared by USDA SCS to simplify the determination of waterway size for given site conditions. The tables conform to the principles outlined in SCS-TP-61, "Handbook of Channel Design for Soil and Water Conservation."

The following example demonstrates how to use the exhibits to design a parabolic channel.

Problem: Given a waterway with parabolic cross-section, determine the safe velocity and dimensions for stability and adequate capacity.

Given:		
	Runoff	Q = 55 c.f.s.
	Grade	= 5 percent
	Vegetative Cover	Bahia grass
	Soil	Erodible
	Condition of Vegetation	
	Good stand--Cut (2.5" - 3")	"D" curve retardance (from Table 6-9, pg. 6-142)
	Good stand--Uncut (6" average)	"C" curve retardance (from Table 6-9)
	Permissible Velocity V_1	5.0 f.p.s. (from Table 6-8, pg. 6-142)

Horizontally opposite 55 c.f.s. in Exhibit 7-5, Sheet 11 of 14 (5% slope) in the columns headed V_1 = 5.0 f.p.s., find T = 20.6 feet, D = 0.87 feet and V_2 = 4.54 f.p.s. Therefore, a waterway with parabolic cross section, a top width of 20.6 feet, and a depth of 0.87 feet will carry 55 c.f.s. at a maximum velocity of 5 feet per second when the vegetative lining is short (2.5" to 3" in height) and 4.54 feet per second when vegetative lining is tall (6" average). This complies with the requirements for safe velocity when vegetation is short ("D" retardance) and capacity when vegetation is tall ("C" retardance).

R0071692

EXHIBIT 7-4

Parabolic Waterway Design Charts (0.25 to 10.0 Percent Slope)
for Retardance Class "D" and "B"

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B".

Grade 0.25 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15																										
20																										
25	11.3	3.27	1.00																							
30	13.2	3.09	1.09																							
35	15.2	3.01	1.13																							
40	17.3	2.99	1.15	12.1	3.61	1.36																				
45	19.3	2.96	1.18	13.4	3.49	1.42																				
50	21.4	2.93	1.18	14.7	3.41	1.48																				
55	23.5	2.92	1.19	16.1	3.38	1.50																				
60	25.5	2.89	1.21	17.5	3.35	1.52																				
65	27.6	2.89	1.21	18.8	3.30	1.56																				
70	29.7	2.89	1.21	20.2	3.28	1.57	14.4	3.98	1.81																	
75	31.7	2.87	1.23	21.6	3.27	1.58	15.3	3.91	1.86																	
80	33.8	2.87	1.23	23.0	3.26	1.58	16.3	3.90	1.87																	
90	38.0	2.87	1.23	25.8	3.25	1.60	18.1	3.80	1.94																	
100	42.1	2.85	1.24	28.6	3.23	1.61	20.0	3.76	1.98																	
110	46.3	2.85	1.24	31.4	3.22	1.62	21.9	3.73	2.01																	
120	50.4	2.84	1.25	34.1	3.20	1.64	23.9	3.73	2.00	17.0	4.47	2.34														
130	54.6	2.85	1.24	36.9	3.19	1.64	25.8	3.70	2.02	18.3	4.42	2.39														
140	58.7	2.84	1.25	39.7	3.19	1.65	27.7	3.68	2.04	19.6	4.37	2.43														
150	62.9	2.85	1.25	42.5	3.19	1.65	29.6	3.67	2.06	20.9	4.33	2.47														
160	67.0	2.84	1.25	45.3	3.18	1.65	31.6	3.68	2.05	22.2	4.30	2.50														
170	71.1	2.84	1.26	48.1	3.18	1.65	33.5	3.66	2.07	23.5	4.27	2.53	18.5	4.95	2.76											
180	75.3	2.84	1.25	50.9	3.18	1.66	35.4	3.65	2.08	24.8	4.24	2.55	19.5	4.90	2.80											
190	79.4	2.84	1.26	53.7	3.18	1.66	37.4	3.66	2.07	26.1	4.22	2.57	20.5	4.87	2.84											
200	83.5	2.84	1.26	56.5	3.18	1.66	39.3	3.65	2.08	27.5	4.23	2.56	21.5	4.83	2.87											
220	91.8	2.84	1.26	62.1	3.18	1.66	43.2	3.65	2.08	30.1	4.19	2.60	23.5	4.77	2.92											
240	100.0	2.83	1.26	67.6	3.17	1.67	47.0	3.63	2.10	32.7	4.15	2.64	25.5	4.72	2.97											
260	108.3	2.84	1.26	73.2	3.17	1.67	50.9	3.63	2.10	35.4	4.15	2.64	27.5	4.68	3.01	21.4	5.50	3.29								
280	116.6	2.84	1.26	78.8	3.17	1.67	54.8	3.63	2.10	38.1	4.14	2.64	29.5	4.64	3.05	22.9	5.44	3.35								
300	124.8	2.84	1.26	84.4	3.17	1.67	58.6	3.62	2.11	40.8	4.14	2.65	31.5	4.61	3.08	24.5	5.42	3.37								

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

6- 666

R0071694

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B".

Grade 0.50 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	10.2	2.28	0.95																							
20	13.3	2.18	1.02																							
25	16.5	2.15	1.05	10.5	2.60	1.35																				
30	19.7	2.12	1.06	12.4	2.51	1.42	9.5	2.91	1.60																	
35	22.8	2.09	1.09	14.3	2.45	1.48	10.9	2.81	1.69																	
40	26.0	2.08	1.09	16.3	2.44	1.49	12.3	2.74	1.76																	
45	29.2	2.08	1.10	18.2	2.41	1.52	13.7	2.69	1.81																	
50	32.4	2.08	1.10	20.2	2.40	1.53	15.1	2.64	1.86	11.1	3.22	2.07														
55	35.6	2.08	1.11	22.1	2.38	1.55	16.6	2.64	1.86	12.0	3.11	2.18														
60	38.8	2.08	1.11	24.1	2.38	1.55	18.0	2.61	1.90	13.0	3.07	2.23														
65	42.0	2.08	1.11	26.0	2.36	1.57	19.5	2.61	1.89	14.0	3.03	2.27														
70	45.2	2.08	1.11	28.0	2.36	1.57	20.9	2.59	1.92	15.0	3.01	2.31														
75	48.4	2.08	1.11	29.9	2.35	1.59	22.4	2.59	1.92	16.0	2.98	2.34	12.7	3.48	2.52											
80	51.6	2.08	1.11	31.9	2.36	1.58	23.8	2.58	1.94	17.0	2.96	2.36	13.4	3.41	2.60											
90	57.9	2.07	1.12	35.8	2.35	1.59	26.7	2.56	1.96	19.1	2.95	2.37	15.0	3.37	2.64											
100	64.3	2.07	1.11	39.7	2.34	1.60	29.6	2.55	1.97	21.1	2.92	2.42	16.5	3.31	2.72	13.3	3.77	2.96								
110	70.7	2.08	1.11	43.6	2.34	1.61	32.6	2.56	1.96	23.2	2.92	2.42	18.1	3.29	2.75	14.5	3.70	3.05								
120	77.0	2.07	1.12	47.5	2.33	1.61	35.5	2.56	1.97	25.2	2.85	2.45	19.6	3.24	2.81	15.7	3.64	3.12								
130	83.4	2.08	1.12	51.5	2.34	1.61	38.4	2.55	1.98	27.3	2.90	2.45	21.2	3.23	2.82	16.9	3.60	3.18								
140	89.7	2.08	1.12	55.4	2.34	1.61	41.3	2.55	1.98	29.3	2.88	2.47	22.8	3.22	2.84	18.1	3.56	3.23								
150	96.0	2.08	1.12	59.3	2.34	1.61	44.2	2.55	1.99	31.4	2.88	2.47	24.3	3.19	2.88	19.4	3.56	3.23	15.5	4.03	3.52					
160	102.3	2.08	1.12	63.2	2.34	1.61	47.1	2.54	1.99	33.5	2.89	2.47	25.9	3.19	2.88	20.6	3.53	3.27	16.4	4.02	3.60					
170	108.6	2.08	1.12	67.1	2.34	1.62	50.0	2.54	1.99	35.5	2.87	2.48	27.5	3.19	2.89	21.9	3.54	3.27	17.4	4.01	3.62					
180	114.9	2.08	1.12	70.9	2.33	1.62	52.9	2.54	1.99	37.6	2.88	2.48	29.1	3.19	2.89	23.1	3.51	3.30	18.3	3.96	3.69					
190	121.2	2.08	1.12	74.8	2.33	1.62	55.8	2.54	2.00	39.6	2.87	2.49	30.6	3.16	2.92	24.3	3.49	3.34	19.3	3.96	3.70					
200	127.4	2.08	1.13	78.7	2.33	1.62	58.7	2.54	2.00	41.7	2.87	2.49	32.2	3.16	2.93	25.6	3.50	3.33	20.2	3.91	3.77	16.8	4.48	3.96		
220	140.0	2.08	1.13	86.5	2.33	1.62	64.5	2.54	2.00	45.8	2.87	2.50	35.4	3.16	2.93	28.1	3.49	3.35	22.1	3.87	3.83	18.3	4.39	4.08		
240	152.6	2.08	1.13	94.3	2.33	1.63	70.3	2.54	2.01	49.9	2.86	2.51	38.6	3.16	2.93	30.6	3.48	3.36	24.1	3.87	3.84	19.9	4.36	4.12		
260	165.2	2.08	1.13	102.1	2.33	1.63	76.1	2.54	2.01	54.0	2.86	2.51	41.7	3.15	2.95	33.1	3.47	3.38	26.0	3.84	3.88	21.5	4.34	4.15		
280	177.7	2.08	1.13	109.8	2.33	1.63	81.9	2.54	2.01	58.2	2.87	2.50	44.9	3.15	2.95	35.6	3.46	3.39	28.0	3.84	3.88	23.0	4.28	4.24	19.0	[illegible]
300	190.3	2.08	1.13	117.6	2.33	1.63	87.7	2.54	2.01	62.3	2.86	2.51	48.0	3.14	2.97	38.1	3.45	3.40	29.9	3.82	3.92	24.6	4.27	4.26	20.2	[illegible]

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

(Sheet 2 of 14)

R0071695

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "R".

Grade 0.75 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	13.7	1.76	0.92	8.0	2.22	1.24																				
20	18.2	1.75	0.93	10.4	2.10	1.35																				
25	22.6	1.73	0.95	12.8	2.03	1.42	9.5	2.33	1.66																	
30	27.1	1.73	0.95	15.3	2.02	1.44	11.2	2.25	1.76	8.9	2.56	1.94														
35	31.5	1.72	0.96	17.8	2.01	1.45	13.0	2.23	1.79	10.2	2.47	2.05														
40	36.0	1.72	0.96	20.2	1.98	1.48	14.8	2.21	1.81	11.6	2.44	2.09														
45	40.4	1.71	0.96	22.7	1.98	1.49	16.5	2.17	1.86	12.9	2.39	2.16														
50	44.9	1.72	0.96	25.2	1.98	1.49	18.3	2.16	1.87	14.3	2.38	2.18	10.6	2.82	2.47											
55	49.3	1.72	0.96	27.6	1.96	1.51	20.1	2.16	1.88	15.7	2.37	2.19	11.6	2.80	2.51											
60	53.7	1.72	0.97	30.1	1.96	1.51	21.9	2.16	1.89	17.1	2.36	2.20	12.5	2.73	2.61											
65	58.1	1.72	0.97	32.5	1.95	1.52	23.6	2.14	1.92	18.4	2.33	2.25	13.5	2.71	2.63	11.2	3.04	2.83								
70	62.5	1.72	0.97	35.0	1.96	1.52	25.4	2.14	1.92	19.8	2.33	2.25	14.4	2.66	2.71	12.0	3.01	2.87								
75	66.9	1.72	0.97	37.4	1.95	1.53	27.2	2.14	1.92	21.2	2.33	2.26	15.4	2.65	2.73	12.8	2.99	2.91								
80	71.2	1.71	0.97	39.9	1.95	1.53	29.0	2.14	1.92	22.5	2.31	2.29	16.4	2.65	2.74	13.5	2.92	3.01								
90	80.0	1.71	0.97	44.8	1.95	1.53	32.5	2.12	1.94	25.3	2.31	2.29	18.4	2.63	2.76	15.1	2.89	3.07	12.4	3.26	3.30					
100	88.8	1.72	0.98	49.7	1.95	1.54	36.1	2.13	1.94	28.1	2.31	2.29	20.4	2.62	2.78	16.7	2.86	3.11	13.7	3.22	3.36					
110	97.6	1.72	0.98	54.7	1.95	1.53	39.7	2.13	1.94	30.8	2.30	2.31	22.4	2.61	2.79	18.3	2.84	3.15	14.9	3.15	3.48					
120	106.3	1.72	0.98	59.6	1.95	1.54	43.2	2.12	1.95	33.6	2.30	2.31	24.4	2.61	2.81	19.9	2.82	3.18	16.2	3.13	3.52	13.4	3.49	3.81		
130	115.0	1.72	0.98	64.5	1.95	1.54	46.8	2.12	1.95	36.4	2.30	2.31	26.3	2.58	2.85	21.5	2.81	3.20	17.5	3.11	3.55	14.5	3.49	3.82		
140	123.7	1.72	0.98	69.4	1.95	1.54	50.3	2.12	1.96	39.1	2.29	2.33	28.3	2.58	2.85	23.1	2.80	3.22	18.7	3.07	3.63	15.5	3.44	3.91		
150	132.4	1.72	0.98	74.2	1.95	1.55	53.9	2.12	1.95	41.9	2.30	2.32	30.3	2.58	2.86	24.7	2.79	3.24	20.0	3.06	3.65	16.5	3.39	3.98		
160	141.1	1.72	0.98	79.1	1.95	1.55	57.4	2.12	1.96	44.6	2.29	2.33	32.3	2.58	2.86	26.3	2.78	3.26	21.3	3.05	3.67	17.6	3.39	3.99	14.4	3.77	4.31
170	149.7	1.72	0.98	84.0	1.95	1.55	60.9	2.12	1.97	47.4	2.30	2.33	34.3	2.58	2.86	28.0	2.80	3.24	22.6	3.04	3.68	18.6	3.36	4.05	15.3	3.77	4.39
180	158.3	1.72	0.98	88.8	1.95	1.55	64.5	2.12	1.96	50.1	2.29	2.34	36.3	2.58	2.86	29.6	2.79	3.25	23.9	3.04	3.69	19.6	3.33	4.11	16.1	3.73	4.46
190	166.9	1.72	0.98	93.7	1.95	1.55	68.0	2.12	1.97	52.8	2.29	2.34	38.3	2.58	2.86	31.2	2.78	3.26	25.2	3.03	3.70	20.7	3.33	4.10	17.0	3.73	4.53
200	175.5	1.72	0.99	98.5	1.95	1.55	71.5	2.12	1.97	55.6	2.29	2.34	40.2	2.57	2.87	32.8	2.78	3.27	26.5	3.03	3.71	21.7	3.31	4.15	17.9	3.70	4.52
220	192.8	1.72	0.99	108.3	1.95	1.55	78.6	2.12	1.97	61.1	2.29	2.34	44.2	2.57	2.87	36.0	2.77	3.27	29.1	3.02	3.73	23.8	3.29	4.19	19.5	3.67	4.59
240	210.1	1.72	0.99	118.0	1.95	1.56	85.6	2.12	1.98	66.6	2.29	2.35	48.2	2.57	2.89	39.2	2.76	3.31	31.7	3.01	3.75	25.9	3.28	4.22	21.2	3.64	4.63
260	227.3	1.72	0.99	127.7	1.95	1.56	92.7	2.12	1.98	72.1	2.29	2.35	52.2	2.57	2.89	42.5	2.77	3.30	34.3	3.01	3.76	28.0	3.26	4.25	22.9	3.62	4.67
280	244.5	1.72	0.99	137.4	1.95	1.56	99.7	2.12	1.98	77.6	2.29	2.35	56.2	2.57	2.89	45.7	2.76	3.31	36.9	3.00	3.77	30.1	3.25	4.26	24.7	3.63	4.65
300	261.7	1.72	0.99	147.1	1.95	1.56	106.8	2.12	1.98	83.0	2.29	2.36	60.1	2.57	2.90	48.9	2.76	3.32	39.5	3.00	3.78	32.2	3.25	4.29	26.4	3.62	4.69

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "R")

6- 668

R0071696

V_1 for RETARDANCE "C". Top Width (T), Depth (D) and V_2 for RETARDANCE "D".

Grade 1.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	15.7	1.55	0.91	9.9	1.80	1.24																				
20	20.9	1.54	0.92	13.0	1.74	1.31	8.8	2.04	1.65																	
25	26.0	1.53	0.93	16.2	1.73	1.32	10.9	1.99	1.70	8.9	2.21	1.87														
30	31.1	1.52	0.94	19.3	1.70	1.35	12.9	1.94	1.78	10.5	2.14	1.98														
35	36.2	1.52	0.94	22.5	1.70	1.36	15.0	1.93	1.80	12.1	2.08	2.06	9.2	2.37	2.37											
40	41.3	1.52	0.95	25.7	1.70	1.36	17.1	1.92	1.81	13.7	2.04	2.12	10.4	2.32	2.45											
45	46.4	1.52	0.95	28.8	1.69	1.37	19.2	1.91	1.82	15.4	2.04	2.12	11.7	2.32	2.46											
50	51.5	1.52	0.95	32.0	1.70	1.37	21.2	1.89	1.85	17.0	2.02	2.16	12.9	2.28	2.52	9.9	2.61	2.90								
55	56.5	1.51	0.95	35.1	1.69	1.38	23.3	1.89	1.86	18.7	2.02	2.16	14.1	2.25	2.57	10.9	2.52	2.91								
60	61.6	1.52	0.95	38.3	1.69	1.37	25.4	1.89	1.86	20.3	2.00	2.19	15.3	2.23	2.61	11.7	2.54	3.00								
65	66.6	1.52	0.96	41.4	1.69	1.38	27.5	1.89	1.86	22.0	2.01	2.19	16.6	2.24	2.60	12.7	2.55	3.00	10.6	2.88	3.16					
70	71.6	1.51	0.96	44.6	1.70	1.38	29.5	1.88	1.88	23.6	1.99	2.21	17.8	2.22	2.64	13.6	2.52	3.01	11.3	2.82	3.26					
75	76.6	1.51	0.96	47.7	1.69	1.38	31.6	1.89	1.88	25.3	2.00	2.21	19.0	2.21	2.66	14.5	2.50	3.08	12.0	2.77	3.35					
80	81.6	1.52	0.96	50.8	1.69	1.38	33.7	1.88	1.88	26.9	1.99	2.22	20.3	2.22	2.64	15.4	2.48	3.11	12.7	2.73	3.43					
90	91.7	1.52	0.96	57.1	1.69	1.39	37.8	1.88	1.89	30.2	1.98	2.24	22.8	2.21	2.65	17.3	2.47	3.13	14.2	2.69	3.45	11.4	2.94	3.82		
100	101.7	1.52	0.96	63.4	1.69	1.39	42.0	1.88	1.89	33.5	1.98	2.24	25.2	2.19	2.69	19.2	2.47	3.14	15.7	2.67	3.55	12.9	2.91	3.85		
110	111.7	1.52	0.97	69.6	1.69	1.39	46.1	1.87	1.90	36.8	1.98	2.25	27.7	2.19	2.70	21.0	2.46	3.20	17.3	2.65	3.63	14.3	2.90	3.88	12.0	
120	121.7	1.52	0.97	75.8	1.69	1.39	50.2	1.87	1.90	40.1	1.98	2.26	30.2	2.19	2.70	22.9	2.46	3.20	18.8	2.64	3.57	15.5	2.91	3.94	13.0	
130	131.6	1.51	0.97	82.1	1.69	1.39	54.4	1.87	1.90	43.4	1.97	2.26	32.7	2.19	2.70	24.9	2.46	3.20	20.3	2.64	3.61	16.7	2.88	4.03	14.0	
140	141.5	1.51	0.97	88.3	1.69	1.39	58.5	1.87	1.90	46.7	1.97	2.26	35.2	2.19	2.70	26.8	2.47	3.24	21.8	2.64	3.63	17.9	2.89	4.06	15.0	
150	151.4	1.52	0.97	94.5	1.69	1.40	62.6	1.87	1.91	50.0	1.98	2.26	37.6	2.19	2.72	29.5	2.48	3.24	23.3	2.62	3.64	19.2	2.89	4.09	16.0	
160	161.1	1.52	0.97	100.7	1.69	1.40	66.7	1.87	1.91	53.3	1.98	2.26	40.1	2.18	2.72	30.3	2.43	3.24	24.8	2.61	3.69	20.4	2.84	4.11	17.0	
170	171.1	1.52	0.97	106.8	1.69	1.40	70.8	1.87	1.91	56.5	1.97	2.28	42.6	2.19	2.72	32.2	2.41	3.24	26.3	2.60	3.70	21.7	2.85	4.13	18.1	
180	180.9	1.52	0.98	113.0	1.69	1.40	74.9	1.87	1.91	59.8	1.97	2.27	45.0	2.18	2.73	34.1	2.42	3.25	27.9	2.61	3.68	22.9	2.81	4.15	19.1	
190	190.6	1.52	0.98	119.1	1.69	1.40	79.0	1.87	1.91	63.1	1.98	2.27	47.5	2.19	2.73	35.9	2.41	3.27	29.4	2.61	3.69	24.1	2.81	4.17	20.1	
200	200.4	1.52	0.98	125.3	1.69	1.40	83.0	1.87	1.92	66.3	1.97	2.28	49.9	2.18	2.74	37.8	2.41	3.27	30.9	2.61	3.71	25.4	2.82	4.15	21.1	
220	220.1	1.52	0.98	137.6	1.69	1.41	91.2	1.87	1.92	72.9	1.97	2.28	54.9	2.18	2.74	41.5	2.41	3.28	33.9	2.59	3.73	27.9	2.82	4.15	23.1	
240	239.8	1.52	0.99	150.0	1.69	1.41	99.4	1.87	1.93	79.5	1.98	2.29	59.8	2.18	2.75	45.3	2.41	3.28	37.0	2.60	3.72	30.4	2.81	4.19	25.0	
260	259.4	1.52	0.98	162.3	1.69	1.41	107.6	1.87	1.93	86.0	1.97	2.29	64.8	2.18	2.74	49.0	2.41	3.29	40.0	2.59	3.75	32.9	2.81	4.20	26.9	
280	279.0	1.52	0.98	174.6	1.70	1.41	115.8	1.87	1.93	92.5	1.97	2.29	69.7	2.18	2.75	52.7	2.40	3.30	43.0	2.58	3.76	35.3	2.79	4.22	28.8	
300	298.5	1.52	0.98	186.9	1.70	1.41	123.9	1.87	1.93	99.1	1.98	2.29	74.6	2.18	2.75	56.5	2.41	3.30	46.1	2.59	3.78	37.8	2.79	4.24	30.8	

Exhibit 7-4 Parabolic waterway design
(Retardance "C" and "D")

Sheet 1 of 1

R0071697

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "R".

Grade 1.25 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	18.1	1.40	0.88	11.5	1.59	1.21	7.7	1.85	1.55																	
20	24.0	1.38	0.89	15.2	1.56	1.25	10.1	1.79	1.64	7.7	2.03	1.89														
25	30.0	1.38	0.89	19.0	1.56	1.25	12.5	1.75	1.69	9.5	1.97	1.97	7.8	2.19	2.16											
30	35.9	1.38	0.90	22.7	1.55	1.27	14.9	1.73	1.73	11.2	1.90	2.09	9.2	2.11	2.28											
35	41.8	1.38	0.90	26.4	1.54	1.28	17.3	1.71	1.75	13.0	1.88	2.12	10.5	2.02	2.44	8.3	2.36	2.64								
40	47.7	1.38	0.90	30.1	1.54	1.28	19.7	1.70	1.77	14.8	1.87	2.15	12.0	2.02	2.44	9.4	2.32	2.72								
45	53.6	1.38	0.90	33.9	1.54	1.28	22.1	1.69	1.78	16.6	1.86	2.17	13.4	1.99	2.50	10.5	2.28	2.78								
50	59.4	1.38	0.91	37.6	1.54	1.28	24.5	1.69	1.79	18.4	1.85	2.18	14.9	1.99	2.50	11.5	2.22	2.90	9.4	2.49	3.16					
55	65.3	1.38	0.91	41.3	1.54	1.28	26.9	1.69	1.80	20.2	1.84	2.19	16.3	1.97	2.54	12.6	2.20	2.94	10.3	2.47	3.20					
60	71.1	1.38	0.91	44.9	1.53	1.29	29.3	1.68	1.81	22.0	1.84	2.20	17.7	1.96	2.57	13.7	2.19	2.97	11.2	2.45	3.23					
65	76.9	1.38	0.91	48.6	1.54	1.29	31.7	1.68	1.81	23.7	1.82	2.24	19.2	1.97	2.56	14.8	2.18	2.99	12.0	2.40	3.34	9.8	2.76	3.55		
70	82.7	1.38	0.91	52.3	1.54	1.29	34.1	1.68	1.81	25.5	1.82	2.24	20.6	1.95	2.58	15.9	2.17	3.01	12.9	2.39	3.36	10.5	2.74	3.61		
75	88.4	1.38	0.91	55.9	1.53	1.30	36.5	1.68	1.82	27.3	1.82	2.24	22.1	1.96	2.57	17.0	2.16	3.03	13.8	2.39	3.38	11.1	2.67	3.76		
80	94.2	1.38	0.91	59.6	1.54	1.30	38.9	1.68	1.82	29.1	1.82	2.24	23.5	1.95	2.59	18.1	2.16	3.05	14.7	2.38	3.39	11.8	2.65	3.80	10.3	2.92	3.94
90	105.8	1.38	0.91	66.9	1.53	1.30	43.7	1.68	1.82	32.7	1.82	2.25	26.4	1.95	2.60	20.3	2.14	3.07	16.4	2.34	3.48	13.2	2.62	3.87	11.4	2.93	4.14
100	117.3	1.38	0.92	74.3	1.54	1.30	48.5	1.68	1.83	36.3	1.82	2.25	29.3	1.95	2.61	22.5	2.14	3.10	18.2	2.34	3.49	14.6	2.59	3.92	12.6	2.90	4.21
110	128.9	1.38	0.92	81.6	1.54	1.31	53.3	1.68	1.83	39.8	1.81	2.27	32.2	1.95	2.61	24.7	2.13	3.11	20.0	2.34	3.50	16.0	2.58	3.97	13.8	2.87	4.27
120	140.4	1.38	0.92	88.9	1.54	1.31	58.1	1.68	1.83	43.4	1.81	2.27	35.0	1.94	2.64	26.9	2.12	3.13	21.7	2.31	3.56	17.4	2.56	4.00	15.0	2.85	4.32
130	151.8	1.38	0.92	96.1	1.53	1.31	62.9	1.68	1.83	47.0	1.82	2.27	37.9	1.94	2.64	29.1	2.12	3.14	23.5	2.31	3.56	18.8	2.55	4.04	15.2	2.84	4.35
140	163.2	1.38	0.92	103.4	1.54	1.31	67.6	1.68	1.84	50.5	1.81	2.28	40.8	1.94	2.64	31.3	2.12	3.14	25.3	2.31	3.56	20.2	2.54	4.06	17.4	2.82	4.39
150	174.6	1.38	0.92	110.6	1.53	1.31	72.4	1.68	1.83	54.1	1.81	2.28	43.7	1.94	2.64	33.5	2.12	3.15	27.0	2.30	3.60	21.6	2.53	4.08	18.6	2.81	4.42
160	186.0	1.38	0.92	117.8	1.53	1.32	77.1	1.68	1.84	57.6	1.81	2.29	46.5	1.93	2.65	35.7	2.12	3.16	28.8	2.30	3.60	22.9	2.50	4.16	19.8	2.77	4.45
170	197.3	1.39	0.92	125.0	1.54	1.32	81.9	1.68	1.84	61.2	1.81	2.28	49.4	1.94	2.65	37.9	2.12	3.16	30.6	2.30	3.59	24.3	2.50	4.17	21.0	2.69	4.47
180	208.5	1.38	0.93	132.2	1.54	1.32	86.6	1.69	1.84	64.7	1.81	2.29	52.2	1.93	2.66	40.1	2.12	3.16	32.3	2.29	3.62	25.7	2.49	4.18	22.2	2.63	4.49
190	219.8	1.39	0.93	139.3	1.54	1.32	91.3	1.68	1.84	68.2	1.81	2.29	55.1	1.94	2.65	42.3	2.12	3.16	34.1	2.30	3.62	27.1	2.49	4.19	23.5	2.68	4.51
200	231.0	1.39	0.93	146.5	1.54	1.32	96.0	1.68	1.84	71.8	1.82	2.29	57.9	1.93	2.66	44.5	2.12	3.17	35.8	2.29	3.64	28.5	2.59	4.20	24.6	2.68	4.53
220	253.7	1.39	0.93	160.9	1.54	1.32	105.5	1.68	1.84	78.9	1.82	2.29	63.7	1.94	2.66	48.9	2.12	3.17	39.4	2.29	3.63	31.3	2.48	4.22	27.0	2.87	4.55
240	276.3	1.39	0.93	175.3	1.54	1.33	115.0	1.69	1.84	85.9	1.81	2.30	69.4	1.94	2.66	53.3	2.11	3.18	42.9	2.29	3.65	34.1	2.48	4.23	29.4	2.66	4.57
260	298.9	1.39	0.93	189.7	1.54	1.33	124.4	1.68	1.85	93.0	1.81	2.30	75.1	1.93	2.67	57.6	2.11	3.19	46.5	2.29	3.66	36.9	2.48	4.24	31.8	2.65	4.59
280	321.3	1.39	0.93	204.0	1.54	1.33	133.9	1.69	1.85	100.1	1.82	2.30	80.8	1.93	2.67	62.0	2.11	3.19	50.0	2.29	3.65	39.7	2.47	4.25	34.2	2.65	4.61
300	343.7	1.39	0.93	218.2	1.54	1.33	143.3	1.69	1.85	107.1	1.81	2.30	86.5	1.94	2.67	66.4	2.11	3.19	53.5	2.28	3.66	42.5	2.47	4.26	36.6	2.65	4.63

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "R")

(Sheet 5 of 14)

R0071698

V_1 for RETARDANCE "F". Top Width (T), Depth (D) and V_2 for RETARDANCE "F".

Grade 1.50 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	20.1	1.29	0.86	13.2	1.43	1.17	8.9	1.65	1.51																	
20	26.8	1.29	0.86	17.5	1.42	1.19	11.7	1.60	1.56	8.1	1.86	1.95	6.7	2.09	2.10											
25	33.4	1.28	0.86	21.8	1.41	1.21	14.5	1.57	1.61	9.9	1.78	2.10	8.1	1.95	2.34											
30	40.0	1.28	0.87	26.2	1.42	1.20	17.4	1.57	1.63	11.8	1.75	2.15	9.6	1.90	2.43	8.0	2.11	2.60								
35	46.5	1.28	0.87	30.5	1.41	1.21	20.2	1.56	1.65	13.7	1.74	2.18	11.1	1.86	2.50	9.2	2.06	2.72								
40	53.1	1.28	0.87	34.8	1.41	1.21	23.0	1.55	1.65	15.6	1.73	2.20	12.6	1.84	2.56	10.4	2.02	2.82	8.2	2.38	3.01					
45	59.6	1.28	0.88	39.0	1.40	1.22	25.9	1.55	1.66	17.5	1.72	2.22	14.2	1.85	2.55	11.7	2.04	2.82	9.1	2.31	3.16					
50	66.1	1.28	0.88	43.3	1.41	1.22	28.7	1.55	1.66	19.4	1.71	2.24	15.7	1.83	2.58	12.9	1.99	2.84	10.0	2.26	3.22					
55	72.6	1.28	0.88	47.6	1.41	1.22	31.5	1.55	1.66	21.3	1.71	2.25	17.2	1.82	2.61	14.2	1.99	2.83	10.9	2.22	3.36	9.3	2.47	3.5.			
60	79.0	1.28	0.88	51.8	1.41	1.22	34.3	1.54	1.69	23.2	1.70	2.25	18.8	1.82	2.60	15.4	1.9	2.8.	11.9	2.22	3.36	10.1	2.5	3.53		
65	85.5	1.28	0.88	56.0	1.40	1.23	37.1	1.54	1.69	25.1	1.70	2.26	20.3	1.82	2.62	16.6	1.9	2.8	12.8	2.19	3.43	10.9	2.39	3.72		
70	91.9	1.28	0.88	60.3	1.41	1.22	39.9	1.54	1.69	27.0	1.70	2.26	21.8	1.81	2.64	17.9	1.9	2.8	13.8	2.20	3.52	11.6	2.4	3.8		
75	98.3	1.28	0.89	64.5	1.41	1.23	42.7	1.54	1.69	28.9	1.70	2.27	23.3	1.80	2.66	19.1	1.9	2.9	14.7	2.18	3.58	12.4	2.3	3.9	10.5	2.4	4.1
80	104.6	1.28	0.89	68.7	1.41	1.23	45.5	1.54	1.70	30.8	1.70	2.27	24.9	1.81	2.66	20.4	1.95	2.98	15.7	2.18	3.46	13.2	2.4	3.91	11.2	2.6	4.2
90	117.5	1.28	0.89	77.1	1.41	1.23	51.1	1.54	1.70	34.6	1.70	2.28	27.9	1.80	2.67	22.9	1.95	3.00	17.6	2.17	3.50	14.7	2.31	3.93	12.5	2.5	4.2
100	130.3	1.28	0.89	85.6	1.41	1.23	56.7	1.54	1.70	38.3	1.69	2.30	31.0	1.80	2.66	25.4	1.9	3.02	19.5	2.16	3.53	16.3	2.30	3.96	13.9	2.5	4.2
110	143.0	1.28	0.89	94.0	1.41	1.24	62.3	1.54	1.71	42.1	1.69	2.30	34.0	1.79	2.68	27.9	1.9	3.03	21.4	2.15	3.56	17.9	2.33	3.95	15.3	2.5	4.2
120	155.8	1.28	0.89	102.4	1.41	1.24	67.9	1.54	1.71	45.9	1.69	2.30	37.1	1.8	2.68	30.4	1.9	3.03	23.3	2.14	3.57	19.5	2.32	3.99	16.6	2.5	4.2
130	168.6	1.28	0.90	110.7	1.41	1.24	73.4	1.54	1.71	49.7	1.69	2.30	40.1	1.79	2.69	32.9	1.9	3.04	25.2	2.14	3.59	21.1	2.29	4.01	17.9	2.5	4.3
140	181.0	1.29	0.90	119.1	1.41	1.24	79.0	1.54	1.71	53.4	1.69	2.31	43.2	1.80	2.68	35.3	1.93	3.0	27.1	2.14	3.60	22.7	2.29	4.02	19.3	2.5	4.3
150	193.6	1.28	0.90	127.4	1.41	1.24	84.5	1.54	1.72	57.2	1.69	2.31	46.2	1.79	2.70	37.8	1.93	3.0	29.0	2.13	3.61	24.3	2.27	4.0	20.6	2.5	4.3
160	205.2	1.28	0.90	135.7	1.41	1.24	90.0	1.54	1.72	60.9	1.69	2.32	49.3	1.80	2.68	40.3	1.93	3.07	30.9	2.13	3.62	25.9	2.2	4.02	22.0	2.5	4.3
170	218.6	1.29	0.90	144.0	1.41	1.24	95.6	1.54	1.73	64.7	1.69	2.31	52.3	1.80	2.69	42.8	1.93	3.0	32.8	2.13	3.62	27.5	2.2	4.03	23.3	2.5	4.3
180	231.1	1.29	0.90	152.2	1.41	1.25	101.0	1.54	1.72	68.4	1.69	2.32	55.3	1.80	2.70	45.2	1.93	3.0	34.7	2.13	3.63	29.1	2.27	4.04	24.7	2.5	4.3
190	243.5	1.28	0.90	160.4	1.41	1.25	106.5	1.54	1.72	72.1	1.69	2.32	58.3	1.80	2.71	47.7	1.93	3.08	36.5	2.13	3.63	30.6	2.27	4.05	26.0	2.5	4.3
200	255.8	1.28	0.91	168.6	1.41	1.25	112.0	1.54	1.73	75.9	1.69	2.33	61.3	1.79	2.71	50.1	1.93	3.08	38.4	2.12	3.64	32.1	2.26	4.12	27.3	2.5	4.3
220	280.9	1.28	0.91	185.2	1.41	1.25	123.0	1.54	1.73	83.4	1.69	2.32	67.4	1.80	2.71	55.1	1.93	3.08	42.2	2.12	3.67	35.3	2.26	4.12	30.0	2.5	4.3
240	305.8	1.28	0.91	201.7	1.41	1.25	134.1	1.54	1.73	90.9	1.69	2.32	73.5	1.80	2.71	60.1	1.92	3.09	46.0	2.12	3.67	38.5	2.26	4.12	32.8	2.5	4.3
260	330.7	1.28	0.91	218.2	1.41	1.26	145.1	1.54	1.73	98.3	1.69	2.33	79.5	1.80	2.72	65.1	1.91	3.09	49.8	2.12	3.68	41.7	2.26	4.12	35.5	2.5	4.3
280	355.5	1.28	0.91	234.7	1.41	1.26	156.0	1.54	1.73	105.8	1.69	2.33	85.5	1.79	2.72	70.0	1.93	3.10	53.6	2.12	3.68	44.8	2.25	4.1.	38.1	2.5	4.3
300	380.2	1.28	0.91	251.1	1.41	1.26	167.0	1.54	1.73	113.2	1.69	2.33	91.6	1.80	2.72	74.9	1.92	3.11	57.4	2.12	3.68	48.0	2.25	4.1.	40.8	2.5	4.3

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

(Sheet 6 of 1.)

R0071699

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B"

Grade 1.75 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	21.8	1.21	0.84	14.2	1.33	1.17	10.0	1.50	1.48	6.9	1.74	1.84														
20	29.0	1.20	0.85	18.9	1.33	1.18	13.2	1.46	1.53	9.0	1.66	1.98	7.6	1.83	2.12											
25	36.2	1.20	0.85	23.5	1.32	1.20	16.4	1.45	1.55	11.2	1.64	2.01	9.3	1.75	2.27	7.6	1.93	2.51								
30	43.4	1.21	0.85	28.2	1.32	1.20	19.6	1.44	1.55	13.3	1.60	2.08	11.1	1.72	2.32	9.0	1.88	2.62								
35	50.5	1.20	0.85	32.8	1.31	1.21	22.8	1.43	1.55	15.5	1.60	2.09	12.8	1.68	2.40	10.4	1.84	2.70	8.2	2.11	2.98					
40	57.6	1.20	0.85	37.4	1.31	1.21	26.0	1.43	1.60	17.6	1.58	2.11	14.6	1.68	2.42	11.8	1.81	2.77	9.3	2.08	3.06					
45	64.6	1.20	0.86	42.0	1.31	1.21	29.2	1.43	1.61	19.8	1.58	2.13	16.4	1.68	2.43	13.2	1.79	2.62	10.3	2.01	3.21	8.6	2.26	3.41		
50	71.6	1.20	0.86	46.6	1.31	1.21	32.4	1.43	1.61	21.9	1.57	2.16	18.2	1.67	2.44	14.7	1.80	2.80	11.4	2.00	3.25	9.5	2.24	3.40		
55	78.6	1.20	0.86	51.2	1.31	1.22	35.6	1.43	1.61	24.1	1.58	2.15	19.9	1.66	2.48	16.1	1.79	2.83	12.5	1.99	3.28	10.3	2.17	3.6.	8.6	2.31	3.7
60	85.6	1.20	0.87	55.8	1.31	1.22	38.8	1.43	1.61	26.2	1.57	2.17	21.7	1.66	2.48	17.5	1.78	2.86	13.6	1.98	3.31	11.2	2.16	3.67	9.2	2.31	3.8
65	92.6	1.20	0.87	60.3	1.31	1.22	41.9	1.43	1.62	28.4	1.57	2.16	23.5	1.66	2.48	18.9	1.77	2.88	14.7	1.97	3.33	12.1	2.15	3.70	9.9	2.30	4.00
70	99.5	1.20	0.87	64.9	1.32	1.22	45.1	1.42	1.62	30.5	1.57	2.18	25.2	1.65	2.50	20.3	1.76	2.90	15.8	1.96	3.35	13.0	2.14	3.73	10.6	2.29	4.05
75	106.4	1.20	0.87	69.4	1.32	1.22	48.2	1.42	1.63	32.7	1.57	2.17	27.0	1.65	2.50	21.8	1.78	2.88	16.9	1.96	3.36	13.9	2.13	3.75	11.3	2.27	4.11
80	113.3	1.20	0.87	73.9	1.31	1.22	51.4	1.43	1.62	34.8	1.57	2.18	28.8	1.66	2.50	23.2	1.77	2.90	17.9	1.94	3.43	14.8	2.13	3.75	12.1	2.27	4.17
90	127.2	1.20	0.87	83.0	1.31	1.23	57.7	1.42	1.63	39.1	1.57	2.18	32.3	1.65	2.52	26.0	1.76	2.93	20.1	1.93	3.45	16.6	2.12	3.81	13.5	2.26	4.23
100	141.0	1.20	0.87	92.1	1.32	1.23	64.0	1.42	1.64	43.4	1.57	2.18	35.8	1.64	2.53	28.9	1.76	2.92	22.3	1.93	3.46	18.4	2.11	3.83	14.9	2.25	4.27
110	154.9	1.21	0.87	101.2	1.32	1.23	70.4	1.43	1.63	47.7	1.57	2.19	39.4	1.65	2.52	31.7	1.76	2.94	24.5	1.92	3.47	20.1	2.08	3.91	16.4	2.24	4.30
120	168.6	1.20	0.88	110.2	1.32	1.23	76.6	1.42	1.64	51.9	1.57	2.20	42.9	1.64	2.53	34.6	1.76	2.91	26.7	1.92	3.48	21.9	2.08	3.93	17.8	2.23	4.33
130	182.3	1.21	0.88	119.2	1.32	1.23	82.9	1.42	1.64	56.2	1.57	2.20	46.4	1.64	2.54	37.4	1.76	2.95	28.9	1.92	3.49	23.7	2.07	3.93	19.2	2.23	4.34
140	196.0	1.21	0.88	128.1	1.32	1.23	89.2	1.43	1.64	60.4	1.57	2.21	49.9	1.64	2.55	40.2	1.75	2.96	31.1	1.92	3.49	25.5	2.07	3.96	20.7	2.23	4.36
150	209.6	1.21	0.88	137.1	1.32	1.23	95.4	1.42	1.64	64.7	1.57	2.20	53.4	1.64	2.55	43.1	1.76	2.95	33.3	1.92	3.49	27.3	2.07	3.95	22.1	2.24	4.38
160	223.1	1.21	0.88	146.0	1.32	1.24	101.6	1.42	1.65	68.9	1.57	2.21	56.9	1.64	2.55	45.9	1.76	2.96	35.4	1.91	3.52	29.1	2.07	3.95	23.6	2.25	4.39
170	236.6	1.21	0.88	154.9	1.32	1.24	107.9	1.43	1.64	73.1	1.57	2.21	60.4	1.64	2.55	48.7	1.76	2.96	37.6	1.91	3.52	30.9	2.07	3.95	25.0	2.24	4.39
180	250.0	1.21	0.89	163.7	1.32	1.24	114.0	1.43	1.65	77.4	1.57	2.21	63.9	1.64	2.55	51.5	1.75	2.97	39.8	1.92	3.52	32.6	2.06	3.99	26.4	2.23	4.39
190	263.5	1.21	0.89	172.6	1.32	1.24	120.2	1.43	1.65	81.6	1.57	2.21	67.4	1.64	2.55	54.3	1.75	2.97	42.0	1.92	3.52	34.4	2.06	3.99	27.9	2.23	4.39
200	276.7	1.21	0.89	181.4	1.32	1.24	126.4	1.43	1.65	85.7	1.57	2.22	70.8	1.64	2.56	57.1	1.75	2.98	44.1	1.91	3.54	36.2	2.06	3.99	29.3	2.23	4.39
220	303.8	1.21	0.89	199.2	1.32	1.24	138.8	1.43	1.65	94.2	1.57	2.22	77.8	1.64	2.57	62.8	1.76	2.97	48.5	1.91	3.53	39.9	2.07	3.99	32.2	2.22	4.39
240	330.8	1.21	0.89	217.0	1.32	1.24	151.2	1.43	1.66	102.7	1.57	2.22	84.8	1.64	2.57	68.4	1.75	2.98	52.9	1.92	3.53	43.3	2.06	4.02	35.1	2.22	4.38
260	357.7	1.21	0.89	234.7	1.32	1.25	163.6	1.43	1.66	111.1	1.57	2.22	91.8	1.64	2.57	74.1	1.76	2.98	57.2	1.91	3.54	46.9	2.06	4.01	38.0	2.22	4.38
280	384.5	1.21	0.89	252.3	1.32	1.25	176.0	1.43	1.66	119.5	1.57	2.23	98.7	1.64	2.58	79.7	1.76	2.98	61.6	1.92	3.54	50.5	2.06	4.01	40.9	2.22	4.39
300	411.2	1.21	0.90	269.9	1.32	1.25	188.3	1.43	1.66	127.9	1.57	2.23	105.7	1.64	2.57	85.3	1.76	2.99	65.9	1.91	3.55	54.0	2.06	4.03	43.7	2.21	4.4

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

6- 672

R0071700

V_1 for RETARDANCE "D". for Width (T), Depth (D) and V_2 for RETARDANCE "R".

Grade 2.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	24.7	1.14	0.79	15.0	1.25	1.18	11.0	1.40	1.43	7.8	1.56	1.81															
20	32.8	1.14	0.79	20.0	1.25	1.18	14.5	1.37	1.49	10.3	1.53	1.88	7.5	1.71	2.29	6.3	1.91	2.44									
25	41.0	1.14	0.79	24.9	1.24	1.20	18.1	1.37	1.50	12.7	1.48	1.96	9.3	1.68	2.36	7.7	1.82	2.62									
30	49.0	1.14	0.80	29.8	1.24	1.20	21.6	1.35	1.52	15.2	1.48	1.98	11.0	1.63	2.47	9.1	1.77	2.76	7.6	1.97	2.95						
35	57.1	1.14	0.80	34.7	1.24	1.21	25.1	1.35	1.54	17.7	1.47	1.99	12.8	1.62	2.50	10.5	1.73	2.86	8.8	1.94	3.03						
40	65.1	1.14	0.80	39.6	1.24	1.21	28.7	1.35	1.53	20.2	1.47	2.00	14.6	1.62	2.51	12.0	1.73	2.86	9.9	1.89	3.18	8.2	2.11	3.32			
45	73.1	1.14	0.80	44.5	1.24	1.21	32.2	1.35	1.54	22.6	1.46	2.01	16.4	1.61	2.52	13.5	1.73	2.86	11.1	1.87	3.21	9.1	2.08	3.52			
50	81.0	1.14	0.81	49.3	1.24	1.22	35.7	1.35	1.55	25.1	1.46	2.03	18.1	1.59	2.57	14.9	1.71	2.92	12.3	1.86	3.24	10.0	2.01	3.44	8.4	2.22	3.68
55	88.9	1.14	0.81	54.2	1.24	1.21	39.2	1.34	1.55	27.6	1.46	2.03	19.9	1.60	2.57	16.4	1.71	2.91	13.5	1.85	3.26	11.0	2.03	3.45	9.3	2.22	3.68
60	96.8	1.14	0.81	59.0	1.24	1.22	42.7	1.34	1.55	30.0	1.45	2.05	21.7	1.60	2.57	17.8	1.69	2.95	14.7	1.85	3.28	11.9	2.03	3.46	10.1	2.22	3.68
65	104.6	1.14	0.81	63.8	1.24	1.22	46.2	1.35	1.55	32.5	1.46	2.04	23.4	1.58	2.60	19.3	1.70	2.94	15.8	1.82	3.36	12.9	2.03	3.22	10.9	2.24	3.71
70	112.4	1.14	0.81	68.6	1.24	1.22	49.7	1.35	1.56	34.9	1.45	2.05	25.2	1.59	2.60	20.7	1.69	2.98	17.0	1.82	3.36	13.8	1.99	3.41	11.7	2.18	3.71
75	120.2	1.14	0.81	73.4	1.24	1.22	53.1	1.35	1.56	37.3	1.45	2.06	27.0	1.59	2.60	22.2	1.69	2.96	18.2	1.82	3.37	14.8	1.98	3.39	12.5	2.17	3.71
80	127.9	1.14	0.82	78.1	1.24	1.23	56.6	1.35	1.56	39.8	1.45	2.06	28.7	1.58	2.62	23.6	1.69	2.99	19.4	1.82	3.37	15.8	1.99	3.36	13.3	2.17	3.71
90	143.6	1.14	0.82	87.8	1.24	1.23	63.5	1.34	1.57	44.7	1.45	2.06	32.3	1.59	2.61	26.5	1.68	3.00	21.8	1.82	3.38	17.7	1.97	3.41	14.9	2.16	3.71
100	159.2	1.14	0.82	97.4	1.24	1.23	70.5	1.34	1.57	49.6	1.45	2.07	35.8	1.59	2.63	29.4	1.68	3.01	24.1	1.80	3.42	19.6	1.96	3.43	16.5	2.15	3.71
110	174.8	1.14	0.82	106.9	1.24	1.23	77.4	1.34	1.57	54.5	1.45	2.07	39.3	1.59	2.64	32.3	1.68	3.02	26.5	1.80	3.43	21.5	1.95	3.45	18.1	2.14	3.71
120	190.3	1.14	0.82	116.5	1.24	1.23	84.3	1.34	1.59	59.4	1.45	2.07	42.9	1.58	2.65	35.2	1.68	3.02	28.9	1.8	3.43	23.5	1.94	3.47	19.7	2.13	3.71
130	205.7	1.14	0.82	126.0	1.24	1.23	91.2	1.34	1.58	64.2	1.45	2.08	46.4	1.58	2.64	38.1	1.68	3.03	31.3	1.80	3.44	25.4	1.93	3.48	21.3	2.12	3.71
140	221.0	1.14	0.82	135.4	1.24	1.24	98.0	1.34	1.58	69.1	1.45	2.08	49.9	1.58	2.64	41.0	1.68	3.03	33.6	1.80	3.44	27.3	1.93	3.50	22.9	2.11	3.71
150	236.3	1.14	0.83	144.9	1.25	1.24	104.9	1.34	1.58	73.9	1.45	2.08	53.4	1.58	2.65	43.9	1.69	3.03	36.0	1.80	3.45	29.2	1.93	3.51	24.5	2.10	3.71
160	251.5	1.14	0.83	154.3	1.25	1.24	111.7	1.34	1.59	78.7	1.45	2.09	56.9	1.58	2.65	46.7	1.67	3.05	38.3	1.79	3.47	31.1	1.93	3.53	26.1	2.09	3.71
170	266.6	1.14	0.83	163.7	1.25	1.24	118.5	1.34	1.59	83.6	1.45	2.08	60.3	1.58	2.66	49.6	1.68	3.05	40.7	1.80	3.46	33.0	1.93	3.54	27.7	2.08	3.71
180	281.7	1.14	0.83	173.0	1.25	1.24	125.2	1.34	1.59	88.4	1.45	2.09	63.8	1.58	2.66	52.5	1.68	3.04	43.0	1.80	3.48	34.9	1.93	3.54	29.3	2.07	3.71
190	296.7	1.14	0.83	182.3	1.25	1.24	132.0	1.34	1.59	93.2	1.45	2.09	67.3	1.58	2.66	55.3	1.68	3.06	45.4	1.80	3.48	36.8	1.93	3.55	30.9	2.06	3.71
200	311.7	1.14	0.83	191.6	1.25	1.24	138.7	1.34	1.60	97.9	1.45	2.10	70.7	1.58	2.67	58.2	1.68	3.05	47.7	1.8	3.49	38.7	1.93	3.5	32.5	2.06	3.71
220	342.1	1.14	0.83	210.4	1.25	1.25	152.4	1.35	1.60	107.6	1.45	2.10	77.7	1.58	2.67	63.9	1.68	3.06	52.5	1.80	3.47	42.6	1.93	3.54	35.8	2.05	3.71
240	372.4	1.14	0.84	229.2	1.25	1.25	165.9	1.34	1.60	117.2	1.45	2.10	84.7	1.58	2.67	69.7	1.68	3.06	57.2	1.80	3.48	46.4	1.93	3.54	39.0	2.05	3.71
260	402.5	1.14	0.84	247.9	1.25	1.25	179.5	1.34	1.60	126.8	1.45	2.10	91.7	1.58	2.67	75.4	1.69	3.07	61.9	1.80	3.49	50.2	1.93	3.53	42.2	2.04	3.71
280	432.6	1.14	0.84	266.5	1.25	1.25	193.0	1.34	1.61	136.4	1.45	2.10	98.6	1.58	2.68	81.1	1.69	3.07	66.6	1.80	3.49	54.0	1.93	3.53	45.4	2.04	3.71
300	462.5	1.14	0.84	285.1	1.25	1.25	206.5	1.35	1.61	146.0	1.44	2.10	105.5	1.58	2.69	86.8	1.68	3.07	71.2	1.79	3.51	57.8	1.94	4.0	48.6	2.03	3.71

Exhibit 7-9 Parabolic waterway design
(Retardance "D" and "R")

R0071701

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B".

Grade 3.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	28.1	0.98	0.80	19.2	1.05	1.10	13.8	1.15	1.44	10.3	1.24	1.74	7.6	1.37	2.12	5.8	1.56	2.54									
20	37.4	0.98	0.80	25.6	1.05	1.10	17.8	1.14	1.45	13.7	1.23	1.76	10.0	1.33	2.22	7.6	1.50	2.59	6.8	1.58	2.74						
25	46.7	0.99	0.80	31.9	1.05	1.11	22.2	1.14	1.47	17.0	1.21	1.80	12.5	1.33	2.23	9.4	1.46	2.69	8.4	1.54	2.85	6.9	1.69	3.15			
30	55.9	0.99	0.81	38.2	1.05	1.11	26.6	1.14	1.47	20.3	1.20	1.82	14.9	1.31	2.27	11.2	1.44	2.75	9.9	1.48	3.02	8.2	1.64	3.29	6.9	1.80	3.57
35	65.0	0.99	0.81	44.4	1.04	1.12	31.0	1.14	1.47	23.7	1.21	1.81	17.3	1.30	2.30	13.0	1.43	2.80	11.5	1.47	3.07	9.5	1.62	3.36	8.0	1.77	3.66
40	74.1	0.99	0.81	50.6	1.04	1.12	35.3	1.14	1.48	27.0	1.20	1.83	19.7	1.29	2.33	14.8	1.42	2.83	13.1	1.46	3.10	10.8	1.60	3.42	9.1	1.75	3.72
45	83.2	0.99	0.81	56.8	1.04	1.13	39.7	1.14	1.48	30.3	1.20	1.84	22.1	1.29	2.34	16.6	1.41	2.85	14.7	1.45	3.12	12.1	1.59	3.44	10.2	1.73	3.76
50	92.2	0.99	0.81	63.0	1.04	1.13	44.0	1.14	1.48	33.6	1.20	1.84	24.6	1.30	2.32	18.4	1.40	2.87	16.3	1.45	3.14	13.4	1.58	3.50	11.3	1.72	4.01
55	101.1	0.99	0.82	69.1	1.04	1.13	48.3	1.14	1.49	36.9	1.20	1.84	27.0	1.30	2.34	20.2	1.40	2.88	17.9	1.45	3.15	14.7	1.57	3.53	12.4	1.71	4.09
60	110.1	0.99	0.82	75.3	1.05	1.13	52.6	1.14	1.49	40.2	1.20	1.85	29.4	1.29	2.34	22.0	1.40	2.89	19.5	1.45	3.16	16.0	1.57	3.55	13.5	1.69	4.15
65	118.9	0.99	0.82	81.4	1.05	1.13	56.9	1.14	1.49	43.4	1.20	1.86	31.8	1.29	2.35	23.8	1.40	2.90	21.1	1.45	3.16	17.3	1.57	3.56	14.6	1.68	4.11
70	127.8	0.99	0.82	87.4	1.04	1.14	61.1	1.14	1.50	46.7	1.20	1.86	34.2	1.29	2.35	25.6	1.40	2.90	22.7	1.45	3.17	18.5	1.55	3.63	15.6	1.68	4.15
75	136.6	0.99	0.82	93.5	1.05	1.14	65.4	1.14	1.50	49.9	1.20	1.87	36.6	1.29	2.35	27.4	1.40	2.91	24.2	1.44	3.21	19.8	1.55	3.64	16.8	1.68	4.20
80	145.3	0.99	0.83	99.5	1.05	1.14	69.6	1.14	1.50	53.1	1.20	1.87	38.9	1.29	2.37	29.2	1.40	2.91	25.8	1.44	3.21	21.1	1.55	3.65	17.9	1.68	4.15
90	163.1	0.99	0.83	111.7	1.05	1.14	78.2	1.14	1.50	59.7	1.20	1.87	43.7	1.29	2.38	32.7	1.39	2.95	29.0	1.44	3.21	23.7	1.54	3.66	20.1	1.67	4.23
100	180.8	0.99	0.83	123.8	1.05	1.15	86.7	1.14	1.51	66.2	1.20	1.88	48.5	1.29	2.38	36.3	1.39	2.95	32.2	1.44	3.21	26.3	1.54	3.67	22.3	1.67	4.23
110	198.3	0.99	0.83	135.9	1.05	1.15	95.2	1.14	1.51	72.7	1.20	1.88	53.3	1.29	2.38	39.9	1.39	2.95	35.4	1.44	3.21	28.9	1.54	3.67	24.5	1.66	4.22
120	215.8	0.99	0.83	148.0	1.05	1.15	103.7	1.14	1.51	79.2	1.20	1.88	58.1	1.29	2.38	43.5	1.39	2.95	38.5	1.43	3.23	31.5	1.54	3.68	26.7	1.67	4.22
130	233.3	0.99	0.83	160.0	1.03	1.15	112.1	1.14	1.51	85.7	1.20	1.88	62.8	1.29	2.39	47.0	1.39	2.96	41.7	1.44	3.23	34.1	1.54	3.69	28.9	1.67	4.26
140	250.6	0.99	0.84	171.9	1.05	1.15	120.5	1.14	1.52	92.1	1.29	1.89	67.6	1.29	2.38	50.6	1.39	2.96	44.8	1.43	3.24	36.7	1.54	3.69	31.1	1.67	4.25
150	267.8	0.99	0.84	183.8	1.05	1.16	128.9	1.14	1.52	98.5	1.20	1.89	72.3	1.29	2.39	54.1	1.39	2.97	48.0	1.44	3.24	39.3	1.55	3.68	33.3	1.67	4.29
160	285.0	0.99	0.84	195.7	1.05	1.16	137.2	1.14	1.52	104.9	1.20	1.89	77.0	1.29	2.39	57.7	1.39	2.96	51.1	1.44	3.25	41.8	1.54	3.70	35.4	1.67	4.27
170	302.0	0.99	0.84	207.5	1.05	1.16	145.5	1.14	1.52	111.3	1.20	1.89	81.7	1.29	2.40	61.2	1.39	2.97	54.3	1.44	3.24	44.4	1.54	3.70	37.6	1.67	4.29
180	319.0	0.99	0.84	219.2	1.05	1.16	153.8	1.14	1.53	117.7	1.20	1.89	86.4	1.29	2.40	64.7	1.39	2.98	57.4	1.44	3.25	47.0	1.55	3.69	39.8	1.67	4.29
190	335.9	0.99	0.85	231.0	1.05	1.16	162.1	1.14	1.53	124.0	1.20	1.90	91.1	1.30	2.40	68.2	1.39	2.98	60.5	1.44	3.25	49.5	1.55	3.71	42.0	1.67	4.30
200	352.7	0.99	0.85	242.6	1.05	1.16	170.3	1.14	1.53	130.3	1.20	1.90	95.7	1.29	2.40	71.7	1.39	2.98	63.6	1.44	3.26	52.1	1.55	3.71	44.1	1.67	4.29
220	387.1	0.99	0.85	266.3	1.05	1.17	187.0	1.14	1.53	143.1	1.20	1.90	105.1	1.29	2.41	78.8	1.39	2.99	69.9	1.44	3.26	57.2	1.54	3.71	48.5	1.67	4.30
240	421.2	0.99	0.85	289.9	1.05	1.17	203.6	1.14	1.53	155.9	1.20	1.90	114.5	1.29	2.41	85.9	1.39	2.99	76.2	1.44	3.26	62.3	1.54	3.72	52.8	1.67	4.30
260	455.2	0.99	0.85	313.4	1.05	1.17	220.2	1.14	1.54	168.6	1.20	1.91	123.9	1.30	2.41	92.9	1.39	2.99	82.4	1.44	3.27	67.5	1.55	3.72	57.2	1.67	4.31
280	489.0	0.99	0.85	336.9	1.05	1.17	236.7	1.14	1.54	181.3	1.20	1.91	133.3	1.30	2.41	99.9	1.39	3.00	88.6	1.44	3.27	72.6	1.55	3.72	61.6	1.67	4.31
300	522.6	0.99	0.86	360.2	1.05	1.17	253.2	1.15	1.54	193.9	1.20	1.91	142.6	1.30	2.42	106.9	1.39	3.00	94.9	1.44	3.27	77.7	1.55	3.73	65.9	1.67	4.31

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

(Sheet 9 of 14)

R0071702

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B".

Grade 4.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	33.1	0.87	0.77	21.6	0.91	1.01	16.3	1.00	1.36	12.1	1.08	1.69	9.2	1.15	2.08	7.4	1.27	2.34	5.7	1.43	2.69						
20	44.0	0.87	0.77	31.5	0.91	1.01	21.7	1.00	1.37	16.1	1.08	1.70	12.3	1.16	2.08	9.7	1.23	2.48	7.4	1.35	2.94	5.4	1.47	3.12			
25	54.9	0.87	0.77	39.1	0.93	1.02	27.1	1.00	1.37	20.1	1.08	1.71	15.3	1.15	2.11	12.1	1.22	2.50	9.2	1.33	3.01	7.9	1.43	3.29	6.5	1.56	3.42
30	65.7	0.87	0.78	46.8	0.93	1.02	32.4	0.99	1.38	24.0	1.07	1.73	18.3	1.14	2.13	14.4	1.20	2.57	11.0	1.32	3.05	9.3	1.38	3.46	7.7	1.52	3.59
35	76.4	0.87	0.78	54.5	0.93	1.02	37.7	0.99	1.39	27.9	1.07	1.74	21.3	1.14	2.14	16.8	1.20	2.57	12.7	1.30	3.14	10.9	1.39	3.42	8.9	1.44	3.51
40	87.1	0.87	0.78	62.1	0.93	1.03	43.0	0.99	1.39	31.9	1.07	1.74	24.3	1.14	2.15	19.2	1.21	2.56	14.5	1.30	3.15	12.4	1.38	3.41	10.2	1.50	3.67
45	97.7	0.87	0.78	69.7	0.91	1.01	48.3	0.99	1.39	35.8	1.07	1.74	27.2	1.13	2.17	21.5	1.20	2.59	16.3	1.30	3.16	13.9	1.37	3.51	11.4	1.46	3.65
50	108.3	0.87	0.78	77.3	0.91	1.03	53.5	0.99	1.40	39.7	1.07	1.75	30.2	1.13	2.17	23.9	1.20	2.58	18.1	1.30	3.16	15.4	1.36	3.54	12.6	1.45	3.71
55	118.8	0.87	0.78	84.7	0.91	1.04	58.7	0.99	1.40	43.6	1.07	1.75	33.2	1.13	2.17	26.2	1.20	2.60	19.8	1.29	3.21	16.9	1.36	3.56	13.8	1.45	3.76
60	129.2	0.87	0.79	92.2	0.91	1.04	63.9	0.99	1.40	47.4	1.07	1.76	36.1	1.13	2.18	28.5	1.19	2.62	21.6	1.29	3.20	18.4	1.36	3.57	15.1	1.44	3.82
65	139.6	0.87	0.79	99.6	0.91	1.04	69.1	0.99	1.41	51.3	1.07	1.76	39.0	1.13	2.19	30.9	1.20	2.61	23.4	1.29	3.19	19.9	1.35	3.58	16.3	1.46	3.86
70	149.9	0.88	0.79	107.0	0.93	1.05	74.2	0.99	1.41	55.1	1.07	1.77	42.0	1.13	2.19	33.2	1.20	2.62	25.1	1.28	3.23	21.4	1.35	3.59	17.5	1.45	3.89
75	160.2	0.88	0.79	115.3	0.91	1.05	79.3	0.99	1.42	58.9	1.07	1.77	44.9	1.13	2.19	35.5	1.20	2.62	26.9	1.29	3.22	22.9	1.35	3.60	18.7	1.45	3.87
80	170.4	0.88	0.79	121.6	0.93	1.05	84.4	0.99	1.42	62.7	1.07	1.77	47.8	1.13	2.20	37.8	1.20	2.63	28.6	1.28	3.24	24.4	1.35	3.60	20.0	1.46	3.96
90	191.1	0.88	0.80	136.5	0.93	1.05	94.8	0.99	1.42	70.4	1.07	1.78	53.7	1.13	2.20	42.4	1.19	2.65	32.1	1.28	3.26	27.4	1.35	3.62	22.4	1.45	4.13
100	211.9	0.88	0.80	151.2	0.93	1.05	105.1	0.99	1.43	78.1	1.07	1.78	59.6	1.13	2.20	47.1	1.20	2.64	35.7	1.29	3.25	30.4	1.35	3.63	24.9	1.45	4.12
110	232.3	0.88	0.80	165.9	0.93	1.06	115.3	0.99	1.43	85.8	1.07	1.78	65.4	1.13	2.21	51.7	1.19	2.65	39.2	1.29	3.25	33.4	1.35	3.63	27.3	1.44	4.15
120	252.7	0.88	0.80	180.5	0.93	1.06	125.5	0.99	1.43	93.4	1.07	1.78	71.2	1.13	2.22	56.3	1.19	2.66	42.7	1.28	3.26	36.3	1.35	3.66	29.8	1.45	4.15
130	273.0	0.88	0.80	195.1	0.93	1.06	135.6	0.99	1.43	101.0	1.07	1.79	77.0	1.13	2.22	60.9	1.19	2.66	46.2	1.29	3.25	39.3	1.34	3.66	32.2	1.44	4.16
140	293.2	0.88	0.80	209.5	0.93	1.06	145.7	0.99	1.44	108.5	1.07	1.79	82.8	1.13	2.22	65.5	1.20	2.66	49.6	1.28	3.28	42.3	1.35	3.66	34.6	1.44	4.18
150	313.4	0.88	0.81	223.9	0.93	1.07	155.8	0.99	1.44	116.0	1.07	1.80	88.5	1.13	2.22	70.1	1.20	2.66	53.1	1.28	3.28	45.3	1.35	3.66	37.1	1.45	4.17
160	333.7	0.88	0.81	238.2	0.93	1.07	165.8	1.00	1.44	123.5	1.07	1.80	94.3	1.13	2.23	74.6	1.20	2.67	56.6	1.28	3.28	48.2	1.35	3.67	39.5	1.44	4.19
170	353.1	0.88	0.81	252.4	0.93	1.07	175.8	1.00	1.44	131.0	1.07	1.80	100.0	1.13	2.23	79.2	1.20	2.67	60.0	1.28	3.29	51.2	1.35	3.67	41.9	1.44	4.19
180	372.8	0.88	0.81	266.5	0.93	1.07	185.7	1.00	1.45	138.4	1.07	1.80	105.7	1.13	2.24	83.7	1.20	2.68	63.5	1.28	3.29	54.1	1.35	3.68	44.3	1.44	4.20
190	392.4	0.88	0.81	280.6	0.93	1.08	195.6	1.00	1.45	145.8	1.07	1.81	111.4	1.13	2.24	88.2	1.20	2.68	66.9	1.28	3.30	57.0	1.35	3.69	46.7	1.44	4.21
200	411.9	0.88	0.82	294.6	0.93	1.08	205.4	1.00	1.45	153.2	1.07	1.81	117.1	1.15	2.24	92.7	1.20	2.68	70.3	1.28	3.30	59.9	1.35	3.69	49.1	1.44	4.21
220	451.0	0.88	0.82	322.7	0.93	1.08	225.0	1.00	1.45	168.2	1.07	1.81	128.6	1.14	2.24	101.9	1.20	2.68	77.2	1.28	3.31	65.8	1.35	3.69	54.0	1.44	4.21
240	491.0	0.88	0.82	351.0	0.93	1.09	245.3	1.00	1.45	183.2	1.07	1.81	140.0	1.15	2.25	110.9	1.20	2.69	84.1	1.28	3.32	71.8	1.35	3.70	58.8	1.44	4.21
260	531.0	0.88	0.82	379.3	0.93	1.09	265.2	1.00	1.46	198.0	1.07	1.82	151.5	1.14	2.25	120.0	1.20	2.69	91.0	1.28	3.32	77.7	1.35	3.70	63	1.44	4.21
280	570.1	0.88	0.82	408.0	0.93	1.09	284.9	1.00	1.46	212.9	1.08	1.82	162.8	1.15	2.25	129.0	1.20	2.70	97.9	1.28	3.32	83.5	1.35	3.71	68.1	1.44	4.22
300	609.1	0.88	0.83	436.3	0.93	1.09	304.6	1.00	1.46	227.6	1.08	1.83	174.2	1.15	2.25	138.1	1.20	2.69	104.8	1.28	3.32	89.4	1.35	3.71	73.1	1.44	4.23

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

6- 675

R0071703

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B".

Grade 5.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	34.8	0.80	0.79	25.2	0.86	1.02	17.7	0.92	1.36	14.3	0.96	1.61	10.6	1.04	2.00	8.4	1.12	2.34	6.7	1.23	2.67	5.4	1.36	3.03			
20	46.3	0.80	0.79	33.5	0.86	1.02	23.5	0.92	1.37	19.0	0.96	1.62	14.1	1.04	2.02	11.1	1.10	2.41	8.8	1.19	2.81	7.0	1.28	3.29	5.1	1.50	3.75
25	57.7	0.80	0.80	41.7	0.86	1.03	29.3	0.92	1.38	23.7	0.96	1.63	17.5	1.03	2.06	13.8	1.09	2.46	10.9	1.17	2.90	8.7	1.26	3.37	7.5	1.35	3.84
30	69.0	0.80	0.80	49.9	0.86	1.04	35.0	0.91	1.39	28.3	0.95	1.65	21.0	1.03	2.06	16.6	1.10	2.53	13.0	1.15	2.96	10.4	1.25	3.41	9.3	1.37	3.78
35	80.3	0.80	0.80	58.1	0.86	1.04	40.8	0.91	1.39	33.0	0.95	1.65	24.4	1.02	2.08	19.3	1.09	2.56	15.2	1.16	2.94	12.1	1.24	3.55	10.3	1.33	3.87
40	91.5	0.81	0.80	66.2	0.86	1.04	46.5	0.91	1.40	37.6	0.95	1.66	27.8	1.02	2.09	22.0	1.09	2.47	17.3	1.15	2.97	13.8	1.24	3.47	11.8	1.30	3.85
45	102.6	0.81	0.81	74.2	0.86	1.05	52.2	0.91	1.40	42.2	0.95	1.66	31.1	1.03	2.08	24.7	1.09	2.48	19.4	1.15	2.99	15.4	1.22	3.55	13.2	1.29	3.91
50	113.7	0.81	0.81	82.3	0.86	1.05	57.9	0.92	1.40	46.8	0.95	1.66	34.7	1.03	2.08	27.3	1.08	2.51	21.5	1.15	3.01	17.1	1.22	3.55	14.7	1.31	3.88
55	124.7	0.81	0.81	90.2	0.86	1.05	63.5	0.91	1.41	51.4	0.96	1.66	38.0	1.02	2.11	30.0	1.08	2.51	23.7	1.15	2.98	18.8	1.22	3.55	16.1	1.24	3.93
60	135.7	0.81	0.81	98.2	0.86	1.05	69.1	0.91	1.41	56.0	0.96	1.66	41.4	1.02	2.11	32.7	1.08	2.51	25.8	1.15	3.00	20.5	1.22	3.55	17.5	1.29	3.97
65	146.5	0.81	0.81	106.1	0.86	1.05	74.7	0.92	1.41	60.5	0.96	1.67	44.8	1.02	2.10	35.3	1.08	2.53	27.9	1.15	3.00	22.1	1.22	3.59	18.9	1.29	4.01
70	157.3	0.81	0.82	113.9	0.86	1.06	80.2	0.91	1.42	65.0	0.96	1.67	48.1	1.02	2.11	38.0	1.08	2.53	30.0	1.15	3.01	23.8	1.22	3.58	20.4	1.29	3.96
75	168.1	0.81	0.82	121.7	0.86	1.06	85.8	0.92	1.42	69.5	0.96	1.67	51.4	1.02	2.12	40.6	1.08	2.54	32.0	1.15	3.04	25.4	1.21	3.62	21.8	1.28	3.99
80	178.8	0.81	0.82	129.4	0.86	1.06	91.3	0.92	1.42	74.0	0.96	1.67	54.8	1.02	2.12	43.3	1.09	2.53	34.1	1.15	3.04	27.1	1.22	3.61	23.2	1.28	4.00
90	200.5	0.81	0.82	145.2	0.86	1.07	102.4	0.92	1.43	83.0	0.96	1.68	61.5	1.02	2.12	48.6	1.08	2.54	38.3	1.15	3.05	30.4	1.21	3.63	26.1	1.28	4.00
100	222.2	0.81	0.82	160.9	0.86	1.07	113.5	0.92	1.43	92.1	0.96	1.68	68.2	1.02	2.13	53.9	1.08	2.54	42.5	1.15	3.05	33.8	1.22	3.61	28.9	1.28	4.03
110	243.7	0.81	0.82	176.5	0.86	1.07	124.6	0.92	1.43	101.0	0.96	1.69	74.8	1.02	2.14	59.2	1.09	2.55	46.7	1.15	3.05	37.1	1.22	3.63	31.8	1.28	4.02
120	265.0	0.81	0.83	192.0	0.86	1.07	135.6	0.92	1.43	110.0	0.96	1.69	81.4	1.02	2.15	64.4	1.08	2.54	50.8	1.15	3.07	40.4	1.21	3.64	35.6	1.28	4.04
130	286.3	0.81	0.83	207.5	0.86	1.08	146.6	0.92	1.43	118.9	0.96	1.69	88.1	1.02	2.14	69.7	1.09	2.56	55.0	1.15	3.06	43.7	1.21	3.65	38.5	1.28	4.05
140	307.4	0.81	0.83	222.8	0.86	1.08	157.5	0.92	1.44	127.8	0.96	1.69	94.6	1.02	2.15	74.9	1.08	2.57	59.1	1.15	3.07	47.0	1.21	3.65	41.3	1.28	4.06
150	328.4	0.81	0.83	238.1	0.87	1.08	168.3	0.92	1.44	136.4	0.96	1.70	101.1	1.02	2.15	80.1	1.08	2.57	63.2	1.15	3.08	50.2	1.21	3.67	44.1	1.28	4.06
160	349.3	0.81	0.83	253.2	0.86	1.08	179.1	0.92	1.44	145.4	0.96	1.70	107.7	1.02	2.16	85.3	1.09	2.57	67.3	1.15	3.09	53.5	1.21	3.67	46.9	1.28	4.07
170	370.0	0.81	0.84	268.3	0.87	1.09	189.9	0.92	1.45	154.1	0.96	1.70	114.2	1.02	2.16	90.4	1.08	2.58	71.4	1.15	3.09	56.8	1.21	3.67	49.8	1.28	4.07
180	390.7	0.82	0.84	283.3	0.87	1.09	200.6	0.92	1.45	162.9	0.96	1.70	120.7	1.02	2.17	95.6	1.09	2.58	75.5	1.15	3.09	60.0	1.21	3.68	52.5	1.28	4.08
190	411.2	0.82	0.84	298.2	0.87	1.09	211.2	0.92	1.45	171.5	0.96	1.71	127.1	1.02	2.17	100.7	1.08	2.59	79.6	1.15	3.09	63.3	1.21	3.68	55.3	1.28	4.08
200	431.6	0.82	0.84	313.0	0.87	1.09	221.8	0.92	1.45	180.2	0.96	1.71	133.5	1.02	2.18	105.8	1.09	2.59	83.6	1.15	3.10	66.5	1.21	3.69	58.1	1.28	4.09
220	473.3	0.82	0.84	343.4	0.87	1.10	243.4	0.92	1.46	197.8	0.97	1.71	146.6	1.02	2.18	116.2	1.09	2.60	91.7	1.15	3.10	73.1	1.22	3.69	63.9	1.28	4.09
240	514.8	0.82	0.84	373.6	0.87	1.10	264.9	0.92	1.46	215.3	0.97	1.72	159.6	1.02	2.18	126.5	1.09	2.60	100.1	1.15	3.10	79.6	1.21	3.70	69.7	1.28	4.10
260	556.1	0.82	0.85	403.6	0.87	1.10	286.3	0.92	1.46	232.7	0.97	1.72	172.6	1.03	2.19	136.8	1.09	2.61	108.2	1.15	3.11	86.1	1.21	3.71	75.4	1.28	4.10
280	597.1	0.82	0.85	433.5	0.87	1.10	307.6	0.92	1.47	250.1	0.97	1.72	185.5	1.03	2.19	147.1	1.09	2.61	116.4	1.15	3.11	92.6	1.21	3.71	81.1	1.28	4.11
300	638.0	0.82	0.85	463.1	0.87	1.11	328.7	0.92	1.47	267.4	0.97	1.73	198.4	1.03	2.19	157.3	1.09	2.61	124.5	1.15	3.12	99.1	1.22	3.71	86.8	1.28	4.11

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

R0071704

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "R".

Grade 6.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	40.5	0.72	0.76	26.9	0.81	1.02	19.6	0.85	1.34	14.8	0.90	1.66	11.7	0.96	1.97	9.4	1.02	2.31	7.6	1.09	2.67	6.1	1.18	3.05	5.0	1.32	3.33
20	53.9	0.72	0.76	35.7	0.81	1.03	26.1	0.85	1.34	19.6	0.89	1.69	15.6	0.96	1.97	12.5	1.01	2.33	10.1	1.08	2.71	8.0	1.14	3.23	6.5	1.25	3.63
25	67.1	0.72	0.76	44.5	0.81	1.03	32.5	0.85	1.35	24.5	0.90	1.69	19.4	0.95	2.00	15.5	1.00	2.39	12.5	1.06	2.80	10.0	1.14	3.24	8.1	1.23	3.69
30	80.3	0.72	0.76	53.2	0.80	1.04	38.9	0.85	1.35	29.3	0.89	1.70	23.3	0.96	1.99	18.6	1.00	2.39	15.0	1.06	2.80	11.9	1.12	3.32	9.6	1.23	3.82
35	93.4	0.72	0.76	61.9	0.81	1.04	45.3	0.85	1.35	34.1	0.89	1.70	27.1	0.96	2.00	21.6	0.99	2.42	17.4	1.05	2.84	13.9	1.13	3.31	11.2	1.23	3.85
40	106.4	0.73	0.77	70.6	0.81	1.04	51.6	0.85	1.36	38.9	0.89	1.71	30.9	0.95	2.01	24.7	1.00	2.41	19.9	1.05	2.83	15.8	1.12	3.35	12.7	1.19	3.93
45	119.3	0.73	0.77	79.2	0.81	1.04	57.9	0.85	1.36	43.7	0.90	1.71	34.6	0.95	2.03	27.7	1.00	2.42	22.3	1.05	2.86	17.7	1.11	3.40	14.3	1.19	3.93
50	132.1	0.73	0.77	87.7	0.81	1.05	64.1	0.84	1.37	48.4	0.89	1.71	38.4	0.95	2.03	30.7	0.99	2.43	24.7	1.05	2.87	19.7	1.12	3.38	15.8	1.18	3.98
55	144.9	0.73	0.77	96.2	0.81	1.05	70.4	0.85	1.37	53.1	0.89	1.72	42.2	0.95	2.03	33.7	0.99	2.44	27.1	1.06	2.89	21.6	1.11	3.40	17.4	1.19	3.96
60	157.5	0.73	0.77	104.6	0.81	1.05	76.5	0.84	1.38	57.8	0.89	1.72	45.9	0.95	2.04	36.7	1.00	2.44	29.6	1.05	2.87	23.5	1.11	3.42	18.9	1.19	4.01
65	170.1	0.73	0.78	113.0	0.81	1.06	82.7	0.85	1.38	62.5	0.90	1.72	49.6	0.95	2.04	39.7	1.00	2.44	32.0	1.05	2.88	25.4	1.11	3.43	20.5	1.18	3.98
70	182.6	0.73	0.78	121.3	0.81	1.06	88.8	0.85	1.38	67.2	0.90	1.72	53.3	0.95	2.05	42.7	1.00	2.44	34.4	1.05	2.88	27.4	1.11	3.41	22.0	1.19	4.01
75	195.1	0.73	0.78	129.6	0.81	1.06	94.9	0.85	1.39	71.8	0.90	1.73	57.0	0.95	2.05	45.6	1.00	2.46	36.7	1.05	2.91	29.3	1.11	3.42	23.6	1.19	3.93
80	207.4	0.73	0.78	137.8	0.81	1.06	100.9	0.85	1.39	76.4	0.90	1.73	60.6	0.95	2.06	48.6	1.00	2.45	39.1	1.05	2.91	31.2	1.11	3.42	25.1	1.19	4.02
90	232.6	0.73	0.78	154.5	1.81	1.07	113.2	0.85	1.40	85.8	0.90	1.73	68.1	0.95	2.06	54.6	1.00	2.45	43.9	1.05	2.92	35.0	1.11	3.44	28.2	1.18	4.02
100	257.7	0.73	0.78	171.2	0.81	1.07	125.5	0.85	1.40	95.1	0.90	1.74	75.5	0.95	2.06	60.5	1.00	2.46	48.7	1.05	2.92	38.8	1.11	3.46	31.3	1.19	4.02
110	282.6	0.74	0.78	187.8	0.81	1.07	137.7	0.85	1.40	104.4	0.90	1.74	82.8	0.95	2.07	66.4	1.00	2.47	53.5	1.05	2.92	42.6	1.11	3.47	34.4	1.19	4.03
120	307.3	0.74	0.79	204.2	0.81	1.08	149.8	0.85	1.40	113.6	0.90	1.74	90.2	0.95	2.07	72.3	1.00	2.47	58.3	1.05	2.92	46.4	1.11	3.47	37.4	1.18	4.04
130	331.9	0.74	0.79	220.6	0.81	1.08	161.9	0.85	1.41	122.8	0.90	1.75	97.5	0.95	2.08	78.2	1.00	2.48	63.0	1.05	2.93	50.2	1.11	3.48	40.5	1.18	4.05
140	356.3	0.74	0.79	236.8	0.81	1.08	173.9	0.85	1.41	131.9	0.90	1.75	104.7	0.95	2.09	84.0	1.00	2.48	67.7	1.05	2.94	54.0	1.11	3.48	43.5	1.19	4.07
150	380.5	0.74	0.79	253.0	0.81	1.09	185.8	0.85	1.41	141.0	0.90	1.75	112.0	0.96	2.09	89.9	1.00	2.48	72.5	1.05	2.93	57.8	1.11	3.48	46.6	1.18	4.04
160	404.6	0.74	0.79	269.0	0.81	1.09	197.7	0.85	1.42	150.1	0.90	1.76	119.2	0.96	2.09	95.7	1.00	2.49	77.2	1.05	2.94	61.5	1.11	3.49	49.6	1.19	4.08
170	428.6	0.74	0.79	285.0	0.81	1.09	209.5	0.85	1.42	159.1	0.90	1.76	126.4	0.96	2.09	101.5	1.00	2.49	81.8	1.05	2.95	65.3	1.11	3.49	52.7	1.19	4.07
180	452.4	0.74	0.79	300.8	0.81	1.09	221.3	0.85	1.42	168.1	0.90	1.76	133.5	0.96	2.10	107.2	1.00	2.50	86.5	1.05	2.95	69.0	1.11	3.49	55.7	1.19	4.08
190	476.1	0.74	0.80	316.6	0.81	1.10	233.0	0.85	1.42	177.0	0.90	1.77	140.6	0.96	2.10	113.0	1.00	2.50	91.1	1.05	2.96	72.7	1.11	3.50	58.7	1.19	4.08
200	499.6	0.74	0.80	332.3	0.81	1.10	244.6	0.85	1.43	185.9	0.90	1.77	147.7	0.96	2.11	118.7	1.00	2.50	95.8	1.05	2.96	76.4	1.11	3.51	61.7	1.18	4.09
220	547.7	0.74	0.80	364.5	0.81	1.10	268.4	0.85	1.43	204.1	0.91	1.77	162.1	0.96	2.11	130.3	1.00	2.51	105.2	1.05	2.96	83.9	1.11	3.51	67.8	1.18	4.09
240	595.6	0.74	0.80	396.5	0.81	1.11	292.1	0.85	1.43	222.1	0.91	1.78	176.5	0.96	2.11	141.9	1.00	2.51	114.5	1.05	2.97	91.4	1.11	3.52	73.8	1.18	4.11
260	643.2	0.74	0.80	428.3	0.81	1.11	315.7	0.85	1.43	240.1	0.91	1.78	190.7	0.96	2.12	153.4	1.00	2.52	123.9	1.05	2.97	98.9	1.11	3.52	79.9	1.18	4.10
280	690.5	0.75	0.81	459.9	0.81	1.11	339.1	0.85	1.44	258.0	0.91	1.78	205.0	0.96	2.12	164.9	1.00	2.52	133.2	1.05	2.97	106.3	1.11	3.53	85.9	1.18	4.11
300	737.5	0.75	0.81	491.4	0.81	1.11	362.4	0.85	1.44	275.8	0.91	1.78	219.1	0.96	2.13	176.3	1.00	2.52	142.4	1.05	7.98	113.7	1.11	3.53	91.9	1.18	4.12

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "R")

(Sheet 12 of 13)

R0071705

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B".

Grade 8.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = [illegible]		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	43.1	0.64	0.80	31.6	0.71	0.98	22.2	0.76	1.31	18.0	0.79	1.56	13.7	0.84	1.92	11.0	0.89	2.[illegible]	9.2	0.95	2.54	7.4	0.99	3.03	[illegible]		
20	57.3	0.64	0.90	42.0	0.71	0.99	29.5	0.76	1.32	24.0	0.79	1.56	18.2	0.84	1.96	14.7	0.89	2.35	12.2	0.93	2.59	9.8	0.99	3.08	[illegible]		
25	71.4	0.65	0.80	52.3	0.71	0.99	36.7	0.76	1.33	29.9	0.79	1.57	22.7	0.84	1.95	18.3	0.89	2.28	15.2	0.93	2.62	12.2	0.97	3.12	[illegible]		
30	85.4	0.65	0.80	62.6	0.71	0.99	43.9	0.76	1.33	35.8	0.79	1.57	27.2	0.84	1.95	21.9	0.89	2.29	18.1	0.92	2.67	14.6	0.97	3.15	[illegible]		
35	99.3	0.65	0.80	72.8	0.72	0.99	51.1	0.76	1.34	41.6	0.79	1.58	31.7	0.84	1.95	25.5	0.89	2.30	21.1	0.92	2.67	17.0	0.96	3.16	[illegible]		
40	113.1	0.65	0.81	82.9	0.72	1.00	58.2	0.76	1.34	47.4	0.79	1.59	36.1	0.84	1.96	29.0	0.88	2.32	24.1	0.92	2.67	19.4	0.96	3.17	[illegible]		
45	126.8	0.65	0.81	93.0	0.72	1.00	65.3	0.76	1.34	53.2	0.79	1.59	40.5	0.84	1.97	32.6	0.88	2.32	27.0	0.92	2.69	21.8	0.97	3.17	[illegible]		
50	140.4	0.65	0.81	102.9	0.72	1.01	72.3	0.76	1.35	59.0	0.79	1.59	44.9	0.84	1.97	36.1	0.88	2.33	30.0	0.92	2.68	24.2	0.97	3.17	[illegible]		
55	153.9	0.65	0.81	112.8	0.72	1.01	79.3	0.76	1.35	64.7	0.79	1.60	49.3	0.84	1.97	39.6	0.88	2.33	32.9	0.92	2.70	26.5	0.96	3.20	[illegible]		
60	167.3	0.65	0.81	122.7	0.72	1.01	86.2	0.76	1.35	70.4	0.79	1.60	53.7	0.84	1.97	43.1	0.88	2.34	35.8	0.92	2.70	28.9	0.97	3.19	[illegible]		
65	180.6	0.65	0.82	132.4	0.72	1.01	93.1	0.76	1.36	76.0	0.79	1.61	58.0	0.84	1.98	46.6	0.88	2.35	38.7	0.92	2.71	31.3	0.97	3.18	[illegible]		
70	193.9	0.65	0.82	142.2	0.72	1.01	100.0	0.76	1.37	81.7	0.79	1.61	62.3	0.84	1.98	50.1	0.88	2.35	41.6	0.92	2.71	33.6	0.97	3.20	[illegible]		
75	207.0	0.65	0.82	151.8	0.72	1.02	106.8	0.76	1.37	87.2	0.79	1.62	66.6	0.84	1.99	53.5	0.88	2.36	44.5	0.92	2.72	35.9	0.96	3.2[illegible]	[illegible]		
80	220.1	0.66	0.82	161.4	0.72	1.02	113.6	0.76	1.37	92.8	0.79	1.62	70.9	0.84	1.99	56.9	0.88	2.37	47.3	0.92	2.73	38.2	0.96	3.2[illegible]	[illegible]		
90	246.8	0.66	0.82	180.9	0.72	1.02	127.4	0.76	1.38	104.1	0.79	1.62	79.5	0.84	2.00	63.9	0.88	2.37	53.1	0.92	2.74	42.9	0.96	3.23	[illegible]		
100	273.3	0.66	0.82	200.3	0.72	1.03	141.1	0.76	1.38	115.4	0.79	1.62	88.1	0.84	2.00	70.8	0.88	2.38	58.9	0.92	2.74	47.6	0.97	3.24	[illegible]		
110	299.6	0.66	0.83	219.6	0.72	1.03	154.8	0.76	1.39	126.5	0.79	1.63	96.7	0.84	2.01	77.7	0.88	2.38	64.7	0.92	2.74	52.3	0.97	3.23	[illegible]		
120	325.7	0.66	0.83	238.8	0.72	1.03	168.4	0.76	1.39	137.7	0.79	1.63	105.3	0.84	2.01	84.6	0.88	2.39	70.5	0.92	2.75	56.9	0.97	3.25	[illegible]		
130	351.7	0.66	0.83	257.9	0.72	1.04	181.9	0.76	1.39	148.7	0.79	1.64	113.8	0.84	2.01	91.4	0.89	2.40	76.1	0.92	2.75	61.5	0.97	3.25	[illegible]		
140	377.5	0.66	0.83	276.8	0.72	1.04	195.3	0.76	1.39	159.7	0.79	1.64	122.2	0.84	2.02	98.2	0.89	2.40	81.8	0.92	2.76	66.2	0.97	3.27	[illegible]		
150	403.1	0.65	0.83	295.6	0.72	1.04	208.6	0.76	1.40	170.7	0.80	1.65	130.6	0.84	2.02	105.0	0.88	2.40	87.4	0.92	2.77	70.8	0.97	3.27	[illegible]		
160	429.5	0.66	0.83	314.2	0.72	1.04	221.9	0.76	1.40	181.5	0.79	1.65	139.0	0.85	2.02	111.7	0.88	2.41	93.1	0.92	2.77	75.3	0.97	3.27	[illegible]		
170	453.8	0.66	0.84	332.8	0.72	1.05	235.1	0.76	1.41	192.4	0.80	1.65	147.3	0.85	2.03	118.4	0.88	2.41	98.7	0.92	2.77	79.9	0.97	3.28	[illegible]		
180	478.9	0.66	0.84	351.2	0.72	1.05	248.2	0.76	1.41	203.1	0.80	1.65	155.6	0.85	2.03	125.1	0.89	2.42	104.3	0.93	2.78	84.4	0.97	3.28	[illegible]		
190	502.9	0.66	0.84	369.1	0.72	1.05	261.[illegible]	0.77	1.41	213.8	0.80	1.66	163.9	0.85	2.04	131.8	0.89	2.42	109.8	0.93	2.78	88.9	0.97	3.29	[illegible]		
200	526.5	0.67	0.84	387.7	0.73	1.05	274.[illegible]	[illegible]	1.41	224.4	0.80	1.66	172.1	0.85	2.04	138.5	0.90	2.43	115.3	0.93	2.79	93.5	0.97	3.29	[illegible]		
220	573.5	0.67	0.84	425.1	0.73	1.06	300.[illegible]	0.77	1.42	246.2	0.80	1.66	188.8	0.85	2.04	151.8	0.90	[illegible]	126.5	0.93	2.80	[illegible]	0.97	3.30	[illegible]		
240	619.1	0.67	0.84	460.[illegible]	[illegible]	1.06	325.[illegible]	[illegible]	1.42	267.9	0.80	1.67	205.5	0.85	2.05	165.2	0.90	2.44	137.5	0.93	2.80	111.9	0.97	3.31	[illegible]		
260	663.[illegible]	[illegible]	0.84	[illegible]	[illegible]	1.06	353.3	[illegible]	1.43	289.4	0.80	1.67	222.1	0.85	2.05	178.6	0.90	2.44	148.	0.93	2.80	120.8	0.97	3.3[illegible]	[illegible]		
280	706.[illegible]	[illegible]	0.84	535.[illegible]	[illegible]	1.07	380.3	[illegible]	1.43	310.8	0.80	1.68	238.6	0.85	2.06	191.9	0.90	2.45	159.1	0.93	2.81	129.3	0.97	3.32	[illegible]		
300	748.[illegible]	[illegible]	0.84	[illegible]	[illegible]	1.07	405.9	[illegible]	1.44	332.1	0.80	1.68	255.0	0.85	2.06	205.1	0.90	[illegible]	171.[illegible]	0.93	2.81	138.3	0.97	3.33	[illegible]		

Exhibit 7-5 Parabolic waterway design
Retardance "D" and "B"

R0071706

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "B".

Grade 10.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T		V_2
15	51.4	0.56	0.77	38.3	0.63	0.92	27.2	0.69	1.15	19.6	0.73	1.56	15.7	0.76	1.86	12.6	0.81	2.19	10.6	0.85	2.46	8.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
20	68.2	0.55	0.78	50.9	0.63	0.92	36.2	0.69	1.18	26.1	0.73	1.56	20.9	0.76	1.87	16.8	0.81	2.18	14.0	0.84	2.52	11.5	0.88	2.91	[illegible]	[illegible]	[illegible]
25	85.0	0.56	0.78	63.4	0.63	0.92	45.1	0.69	1.19	32.5	0.73	1.57	26.1	0.76	1.87	20.9	0.80	2.20	17.5	0.84	2.52	14.3	0.87	2.86	11.9	0.92	3.2[illegible]
30	101.6	0.56	0.78	75.8	0.63	0.92	53.9	0.69	1.20	38.8	0.72	1.58	31.2	0.76	1.88	25.0	0.80	2.22	20.9	0.83	2.55	17.1	0.87	2.98	14.2	[illegible]	[illegible]
35	118.1	0.56	0.78	88.1	0.63	0.93	62.7	0.69	1.20	45.2	0.73	1.58	36.3	0.76	1.88	29.1	0.80	2.22	24.3	0.83	2.57	19.9	0.87	3.01	16.[illegible]	[illegible]	[illegible]
40	134.4	0.56	0.79	100.3	0.64	0.93	71.3	0.69	1.21	51.5	0.73	1.59	41.3	0.76	1.90	33.2	0.80	2.22	27.7	0.83	2.59	22.[illegible]	[illegible]	[illegible]	18.[illegible]	[illegible]	[illegible]
45	150.7	0.56	0.79	112.5	0.64	0.93	80.0	0.69	1.21	57.7	0.72	1.60	46.4	0.76	1.90	37.2	0.80	2.24	31.1	0.83	2.59	25.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
50	166.8	0.56	0.79	124.5	0.64	0.93	88.5	0.69	1.21	63.9	0.72	1.60	51.3	0.76	1.91	41.3	0.80	2.23	34.5	0.83	2.59	28.3	0.87	3.01	23.5	[illegible]	[illegible]
55	182.8	0.56	0.79	136.4	0.64	0.93	97.1	0.69	1.21	70.1	0.73	1.60	56.3	0.76	1.92	45.3	0.80	2.24	37.8	0.83	2.60	31.1	0.87	3.02	25.[illegible]	[illegible]	[illegible]
60	198.6	0.56	0.79	148.2	0.64	0.94	105.5	0.69	1.22	76.2	0.72	1.61	61.2	0.76	1.92	49.3	0.80	2.25	41.1	0.83	2.61	33.[illegible]	[illegible]	[illegible]	28.1	[illegible]	[illegible]
65	214.3	0.57	0.79	160.0	0.64	0.94	113.9	0.69	1.22	82.3	0.73	1.62	66.2	0.76	1.92	53.2	0.80	2.26	44.4	0.83	2.62	36.5	0.87	3.04	30.3	[illegible]	[illegible]
70	229.9	0.57	0.79	171.6	0.64	0.94	122.2	0.69	1.23	88.4	0.73	1.62	[illegible]	[illegible]	1.93	57.2	0.80	2.26	47.7	0.83	2.63	39.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
75	245.4	0.57	0.80	183.2	0.64	0.94	130.5	0.69	1.23	94.4	0.73	1.62	75.9	[illegible]	1.93	61.1	0.80	2.27	51.0	0.83	2.63	42.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
80	260.7	0.57	0.80	194.6	0.64	0.95	138.6	0.69	1.24	100.3	0.73	1.63	80.7	[illegible]	1.94	65.0	0.80	2.27	54.3	0.83	2.63	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
90	292.1	0.57	0.80	218.1	0.64	0.95	155.4	0.69	1.24	112.5	0.73	1.64	90.5	[illegible]	1.95	73.0	0.81	2.27	60.9	0.83	2.64	50.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
100	323.3	0.57	0.80	241.5	0.64	0.95	172.1	0.69	1.24	124.6	0.73	1.64	100.3	[illegible]	1.95	80.9	0.81	2.28	67.5	0.83	2.65	55.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
110	354.3	0.57	0.80	264.6	0.64	0.96	188.6	0.69	1.25	136.7	0.73	1.64	110.0	[illegible]	1.96	88.7	0.81	2.28	74.1	0.83	2.65	61.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
120	385.0	0.57	0.80	287.6	0.64	0.96	205.0	0.69	1.25	148.7	0.73	1.65	119.6	[illegible]	1.97	96.5	0.81	2.29	80.6	0.83	2.66	66.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
130	415.5	0.57	0.81	310.3	0.65	0.96	221.3	0.69	1.26	160.6	0.73	1.65	129.3	[illegible]	1.97	104.2	0.81	2.30	87.1	0.83	2.67	71.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
140	445.7	0.57	0.81	333.0	0.65	0.96	237.5	0.69	1.26	172.5	0.73	1.65	138.8	[illegible]	1.97	112.1	0.81	2.31	93.5	0.83	2.68	77.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
150	475.7	0.58	0.81	355.4	0.65	0.97	253.6	0.69	1.26	184.2	0.73	1.66	148.4	0.76	1.97	119.8	0.81	2.31	100.[illegible]	[illegible]	2.[illegible]	82.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
160	505.5	0.58	0.81	377.7	0.65	0.97	269.5	0.69	1.27	195.9	0.73	1.66	157.8	[illegible]	1.98	127.4	0.81	[illegible]	106.[illegible]	[illegible]	2.69	87.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
170	535.0	0.58	0.81	399.7	0.65	0.97	285.3	0.69	1.27	207.6	0.73	1.66	167.2	[illegible]	1.99	135.[illegible]	[illegible]	[illegible]	112.[illegible]	[illegible]	2.69	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
180	564.3	0.58	0.81	421.7	0.65	0.97	301.0	0.70	1.28	219.1	[illegible]	1.67	176.6	[illegible]	1.99	142.[illegible]	[illegible]	[illegible]	119.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
190	593.4	0.58	0.82	443.4	0.65	0.98	316.6	0.70	1.28	230.5	0.73	1.67	185.4	[illegible]	1.99	150.1	[illegible]	[illegible]	125.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
200	622.2	0.58	0.82	465.0	0.65	0.98	332.1	0.70	1.29	242.1	[illegible]	1.68	195.2	[illegible]	1.99	157.6	[illegible]	[illegible]	131.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
220	681.9	0.58	0.82	509.6	0.65	0.98	364.1	0.70	1.29	265.5	[illegible]	1.68	214.1	[illegible]	[illegible]	173.[illegible]	[illegible]	[illegible]	144.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
240	741.1	0.58	0.82	553.8	0.65	0.99	395.9	0.70	[illegible]	288.8	0.73	1.68	233.[illegible]	[illegible]	2.00	188.2	0.81	2.34	157.4	0.84	2.72	123.[illegible]	0.[illegible]	3.[illegible]	[illegible]	[illegible]	[illegible]
260	799.9	0.58	0.82	597.7	0.65	0.99	427.4	0.70	1.29	311.0	0.73	1.69	251.[illegible]	[illegible]	2.01	203.[illegible]	0.81	2.34	170.1	0.84	2.[illegible]	134.[illegible]	[illegible]	3.[illegible]	[illegible]	[illegible]	3.[illegible]
280	858.2	0.58	0.83	641.3	0.65	0.99	458.7	0.70	1.30	335.0	0.73	1.69	270.4	[illegible]	2.01	218.5	0.81	2.35	182.7	0.84	2.73	145.[illegible]	[illegible]	3.[illegible]	[illegible]	[illegible]	3.[illegible]
300	916.0	0.59	0.83	684.6	0.65	0.99	489.8	0.70	1.30	357.9	0.73	1.69	289.[illegible]	[illegible]	2.01	233.5	0.81	2.35	195.[illegible]	0.84	2.73	154.[illegible]	[illegible]	3.[illegible]	[illegible]	[illegible]	3.[illegible]

Exhibit 7-4 Parabolic waterway design
(Retardance "D" and "B")

(Sheet 14 of 15)

R0071707

EXHIBIT 7-5

Parabolic Waterway Design Charts (0.25 to 10.0 Percent Slope)
for Retardance Class "D" and "C"

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 0.25 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15																										
20																										
25	9.6	2.36	1.63																							
30	11.4	2.31	1.68																							
35	13.2	2.27	1.73																							
40	15.0	2.25	1.76	10.4	2.67	2.13																				
45	16.8	2.23	1.78	11.6	2.62	2.19																				
50	18.6	2.21	1.80	12.8	2.59	2.24																				
55	20.4	2.20	1.82	14.0	2.56	2.28																				
60	22.2	2.19	1.83	15.2	2.53	2.31																				
65	24.0	2.18	1.84	16.5	2.54	2.30																				
70	25.8	2.18	1.85	17.7	2.52	2.33	12.6	3.05	2.70																	
75	27.6	2.17	1.86	18.9	2.51	2.35	13.4	3.00	2.76																	
80	29.4	2.17	1.87	20.1	2.50	2.37	14.3	3.01	2.76																	
90	33.1	2.17	1.86	22.6	2.49	2.38	16.0	2.97	2.81																	
100	36.7	2.17	1.87	25.1	2.49	2.38	17.7	2.95	2.85																	
110	40.3	2.16	1.88	27.5	2.47	2.41	19.4	2.93	2.88																	
120	43.9	2.16	1.89	30.0	2.47	2.41	21.1	2.91	2.91	15.2	3.58	3.28														
130	47.6	2.16	1.88	32.5	2.48	2.41	22.8	2.89	2.93	16.4	3.55	3.37														
140	51.2	2.16	1.88	34.9	2.46	2.43	24.6	2.91	2.91	17.6	3.53	3.35														
150	54.8	2.16	1.89	37.4	2.47	2.42	26.3	2.90	2.93	18.8	3.51	3.39														
160	58.4	2.16	1.89	39.9	2.47	2.42	28.0	2.89	2.95	20.0	3.49	3.41														
170	62.0	2.16	1.89	42.3	2.46	2.43	29.7	2.88	2.96	21.2	3.47	3.44	16.7	4.03	3.75											
180	65.6	2.16	1.90	44.8	2.47	2.43	31.4	2.87	2.97	22.4	3.46	3.46	17.6	4.00	3.81											
190	69.2	2.16	1.90	47.2	2.46	2.44	33.1	2.87	2.98	23.6	3.45	3.48	18.5	3.97	3.85											
200	72.8	2.16	1.90	49.7	2.46	2.44	34.9	2.88	2.97	24.8	3.44	3.49	19.4	3.94	3.90											
220	80.0	2.16	1.90	54.6	2.46	2.44	38.3	2.87	2.99	27.2	3.42	3.53	21.3	3.92	3.92											
240	87.3	2.16	1.90	59.5	2.46	2.45	41.7	2.86	3.00	29.6	3.40	3.55	23.1	3.88	3.99											
260	94.5	2.16	1.90	64.5	2.46	2.44	45.2	2.86	3.00	32.1	3.41	3.54	25.0	3.87	4.01	19.5	4.57	[illegible]								
280	101.7	2.16	1.90	69.4	2.46	2.45	48.6	2.85	3.01	34.5	3.40	3.56	26.9	3.86	4.02	21.0	4.57	[illegible]								
300	108.9	2.16	1.90	74.3	2.46	2.45	52.1	2.86	3.00	36.9	3.39	3.58	28.7	3.83	4.02	22.4	4.51	[illegible]								

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

(Sheet 1 of 1.)

R0071709

V_1 for RETARDANCE "D". Top Width (T). Depth (D) and V_2 for RETARDANCE "C".

Grade 0.50 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	8.6	1.63	1.58																							
20	11.3	1.58	1.66																							
25	14.1	1.57	1.67	9.0	1.91	2.14																				
30	16.9	1.56	1.68	10.7	1.87	2.21	8.2	2.18	2.48																	
35	19.6	1.55	1.71	12.4	1.85	2.26	9.4	2.10	2.62																	
40	22.4	1.55	1.71	14.1	1.83	2.30	10.7	2.08	2.66																	
45	25.1	1.54	1.73	15.8	1.82	2.33	11.9	2.03	2.76																	
50	27.9	1.54	1.73	17.5	1.80	2.35	13.2	2.02	2.78	9.6	2.42	3.19														
55	30.7	1.54	1.72	19.2	1.80	2.37	14.5	2.02	2.79	10.5	2.39	3.25														
60	33.4	1.54	1.74	20.9	1.79	2.38	15.8	2.01	2.80	11.4	2.37	3.30														
65	36.1	1.53	1.75	22.7	1.80	2.36	17.0	1.99	2.86	12.3	2.35	3.34														
70	38.9	1.54	1.74	24.4	1.80	2.37	18.3	1.99	2.86	13.2	2.33	3.38														
75	41.6	1.54	1.75	26.1	1.80	2.38	19.6	1.99	2.86	14.1	2.32	3.41	11.2	2.71	3.66											
80	44.3	1.53	1.75	27.8	1.80	2.39	20.9	1.99	2.86	15.0	2.31	3.43	11.8	2.65	3.80											
90	49.8	1.53	1.75	31.2	1.78	2.41	23.5	1.99	2.87	16.9	2.31	3.42	13.3	2.65	3.78											
100	55.3	1.53	1.75	34.6	1.78	2.42	26.0	1.97	2.90	18.7	2.29	3.47	14.7	2.63	3.85	11.9	3.02	4.19								
110	60.8	1.54	1.75	38.1	1.78	2.41	28.6	1.97	2.90	20.5	2.28	3.50	16.1	2.60	3.90	13.0	2.99	4.22								
120	66.3	1.54	1.75	41.5	1.78	2.42	31.2	1.96	2.91	22.4	2.29	3.49	17.5	2.59	3.94	14.1	2.96	4.30								
130	71.7	1.53	1.76	44.9	1.78	2.42	33.7	1.97	2.93	24.2	2.28	3.51	18.9	2.57	3.98	15.2	2.91	4.36								
140	77.2	1.54	1.76	48.3	1.78	2.43	36.3	1.97	2.92	26.0	2.27	3.54	20.4	2.58	3.95	16.4	2.91	4.34								
150	82.6	1.54	1.76	51.7	1.78	2.43	38.9	1.97	2.91	27.9	2.28	3.52	21.8	2.57	3.98	17.5	2.90	4.39	14.0	3.31	4.77					
160	88.0	1.53	1.76	55.1	1.78	2.44	41.4	1.97	2.93	29.7	2.27	3.54	23.2	2.56	4.01	18.6	2.88	4.46	14.9	3.33	4.90					
170	93.4	1.53	1.77	58.5	1.78	2.44	44.0	1.97	2.93	31.5	2.26	3.55	24.6	2.55	4.03	19.8	2.89	4.51	15.7	3.27	4.92					
180	98.8	1.53	1.77	61.9	1.78	2.44	46.5	1.96	2.94	33.3	2.26	3.57	26.1	2.56	4.01	20.9	2.84	4.55	16.6	3.29	4.93					
190	104.2	1.54	1.77	65.3	1.78	2.44	49.1	1.97	2.91	35.2	2.27	3.55	27.5	2.56	4.03	22.0	2.86	4.49	17.5	3.28	4.90					
200	109.6	1.54	1.77	68.7	1.78	2.44	51.6	1.96	2.94	37.0	2.26	3.56	28.9	2.55	4.04	23.1	2.85	4.52	19.4	3.25	4.95	15.3	3.72	5.21		
220	120.5	1.54	1.77	75.5	1.78	2.44	56.8	1.97	2.93	40.7	2.26	3.56	31.8	2.55	4.04	25.4	2.85	4.53	20.2	3.27	5.01	16.7	3.68	5.19		
240	131.3	1.54	1.77	82.3	1.78	2.45	61.9	1.97	2.94	44.3	2.26	3.58	34.6	2.54	4.07	27.7	2.85	4.51	22.0	3.23	5.04	18.2	3.65	5.19		
260	142.1	1.54	1.77	89.1	1.78	2.45	67.0	1.97	2.94	48.0	2.26	3.58	37.5	2.55	4.06	30.0	2.85	4.53	23.8	3.22	5.06	19.7	3.64	5.19		
280	152.9	1.54	1.78	95.9	1.78	2.45	72.1	1.97	2.94	51.6	2.25	3.59	40.3	2.54	4.08	32.2	2.85	4.54	25.6	3.21	5.06	21.1	3.61	5.20		
300	163.7	1.54	1.78	102.6	1.78	2.46	77.2	1.97	2.94	55.3	2.26	3.59	43.2	2.54	4.08	34.5	2.84	4.54	27.3	3.19	5.05	22.6	3.60	5.20		

Exhibit 7-5 Parabolic waterway design
(Retardance "D and "C")

(Sheet 2 of 14)

6- 682

R0071710

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 0.75 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	11.7	1.29	1.47	6.8	1.61	2.02																				
20	15.5	1.27	1.51	8.9	1.54	2.15																				
25	19.3	1.26	1.52	11.0	1.50	2.23	8.2	1.74	2.58																	
30	23.1	1.25	1.54	13.2	1.50	2.24	9.7	1.69	2.70	7.7	1.92	2.99														
35	27.0	1.26	1.53	15.3	1.48	2.29	11.3	1.68	2.72	8.9	1.88	3.08														
40	30.8	1.26	1.53	17.5	1.49	2.28	12.8	1.65	2.80	10.1	1.86	3.16														
45	34.5	1.25	1.55	19.6	1.47	2.31	14.4	1.65	2.80	11.3	1.84	3.21														
50	38.3	1.25	1.55	21.8	1.48	2.30	15.9	1.63	2.85	12.5	1.82	3.26	9.3	2.18	3.65											
55	42.1	1.25	1.55	24.0	1.48	2.29	17.5	1.64	2.85	13.7	1.81	3.30	10.1	2.12	3.80											
60	45.9	1.25	1.55	26.1	1.48	2.31	19.1	1.64	2.84	15.0	1.82	3.26	11.0	2.12	3.82											
65	49.6	1.25	1.56	28.2	1.47	2.33	20.6	1.63	2.83	16.2	1.81	3.29	11.9	2.11	3.84	9.9	2.34	4.06								
70	53.4	1.25	1.56	30.4	1.48	2.32	22.2	1.63	2.87	17.4	1.80	3.31	12.8	2.11	3.85	10.6	2.35	4.15								
75	57.1	1.25	1.56	32.5	1.47	2.33	23.7	1.62	2.90	18.6	1.80	3.34	13.6	2.07	3.95	11.3	2.33	4.22								
80	60.9	1.25	1.56	34.7	1.48	2.32	25.3	1.63	2.89	19.8	1.79	3.35	14.5	2.07	3.95	12.0	2.31	4.28								
90	68.4	1.25	1.56	38.9	1.47	2.34	28.4	1.62	2.91	22.2	1.78	3.39	16.3	2.07	3.97	13.4	2.28	4.36	11.1	2.62	4.59					
100	75.9	1.25	1.56	43.2	1.47	2.34	31.5	1.62	2.92	24.7	1.79	3.37	18.1	2.07	3.98	14.9	2.26	4.37	12.2	2.56	4.75					
110	83.4	1.25	1.57	47.5	1.47	2.34	34.7	1.63	2.93	27.1	1.78	3.40	19.8	2.04	4.04	16.3	2.26	4.45	13.4	2.55	4.78					
120	90.8	1.25	1.57	51.8	1.47	2.34	37.8	1.62	2.91	29.6	1.79	3.38	21.6	2.05	4.04	17.8	2.26	4.43	14.6	2.54	4.80	12.1	2.85	5.16		
130	98.3	1.25	1.57	56.0	1.47	2.35	40.9	1.62	2.93	32.0	1.78	3.40	23.4	2.05	4.04	19.2	2.25	4.49	15.7	2.51	4.91	13.0	2.81	5.29		
140	105.7	1.25	1.57	60.3	1.47	2.35	44.0	1.62	2.92	34.4	1.78	3.41	25.1	2.03	4.09	20.7	2.25	4.48	16.9	2.51	4.92	14.0	2.81	5.29		
150	113.1	1.25	1.58	64.5	1.47	2.36	47.1	1.62	2.93	36.8	1.77	3.43	26.9	2.04	4.08	22.1	2.23	4.52	18.1	2.50	4.92	15.0	2.81	5.30		
160	120.5	1.25	1.58	68.8	1.47	2.35	50.2	1.62	2.93	39.3	1.78	3.41	28.7	2.04	4.07	23.6	2.24	4.50	19.3	2.50	4.93	15.9	2.77	5.46	13.1	3.1	5.9
170	127.9	1.25	1.58	73.0	1.47	2.36	53.3	1.62	2.93	41.7	1.78	3.42	30.4	2.03	4.11	25.0	2.23	4.54	20.4	2.48	5.00	16.9	2.78	5.47	13.9	3.1	5.95
180	135.2	1.25	1.58	77.2	1.47	2.36	56.4	1.62	2.93	44.1	1.78	3.43	32.2	2.03	4.10	26.5	2.24	4.52	21.6	2.48	5.00	17.8	2.75	5.45	14.7	3.1	5.95
190	142.6	1.25	1.58	81.5	1.47	2.36	59.5	1.62	2.93	46.5	1.77	3.43	34.0	2.04	4.09	27.9	2.23	4.50	22.8	2.48	5.00	18.8	2.75	5.44	15.5	3.1	5.93
200	149.9	1.25	1.58	85.7	1.47	2.36	62.5	1.62	2.93	48.9	1.77	3.44	35.7	2.03	4.12	29.4	2.23	4.54	24.0	2.49	4.99	19.7	2.73	5.44	16.3	3.1	5.93
220	164.7	1.25	1.58	94.2	1.47	2.36	68.7	1.62	2.93	53.6	1.76	3.41	39.3	2.03	4.11	32.3	2.23	4.55	26.3	2.47	5.05	21.7	2.74	5.52	17.9	3.09	5.97
240	179.4	1.25	1.59	102.6	1.47	2.37	74.9	1.62	2.95	58.6	1.77	3.44	42.8	2.03	4.12	35.2	2.23	4.56	28.7	2.47	5.06	23.6	2.72	5.57	19.4	3.05	6.02
260	194.1	1.25	1.59	111.1	1.47	2.37	81.1	1.62	2.95	63.5	1.78	3.44	46.3	2.02	4.14	38.1	2.23	4.57	31.0	2.46	5.09	25.5	2.71	5.61	21.0	3.05	6.05
280	208.8	1.25	1.59	119.5	1.47	2.37	87.3	1.62	2.95	68.3	1.77	3.44	49.9	2.03	4.13	41.0	2.22	4.58	33.4	2.46	5.08	27.4	2.70	5.63	22.6	3.04	6.06
300	223.5	1.26	1.59	127.9	1.47	2.37	93.4	1.62	2.96	73.1	1.77	3.45	53.4	2.03	4.13	43.9	2.22	4.58	35.8	2.47	5.07	29.4	2.71	5.62	24.2	3.04	6.06

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

6- 683

R0071711

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 1.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	13.4	1.13	1.47	8.4	1.30	2.03																				
20	17.8	1.12	1.49	11.1	1.27	2.10	7.6	1.52	2.55																	
25	22.2	1.11	1.50	13.9	1.27	2.09	9.4	1.49	2.64	7.6	1.62	2.99														
30	26.6	1.11	1.50	16.6	1.26	2.13	11.2	1.46	2.71	9.1	1.61	3.03														
35	30.9	1.11	1.52	19.3	1.25	2.15	13.0	1.45	2.75	10.5	1.57	3.14	8.0	1.80	3.59											
40	35.3	1.11	1.52	22.1	1.26	2.13	14.8	1.44	2.79	12.0	1.57	3.14	9.1	1.78	3.65											
45	39.7	1.11	1.52	24.8	1.25	2.15	16.7	1.45	2.76	13.4	1.55	3.21	10.2	1.76	3.70											
50	44.0	1.11	1.52	27.5	1.25	2.16	18.5	1.44	2.79	14.9	1.55	3.21	11.3	1.75	3.74	8.7	2.02	4.20								
55	48.3	1.11	1.53	30.2	1.25	2.16	20.3	1.43	2.80	16.3	1.54	3.26	12.4	1.75	3.76	9.5	1.99	4.30								
60	52.7	1.11	1.52	32.9	1.25	2.17	22.1	1.43	2.82	17.8	1.54	3.25	13.5	1.74	3.79	10.4	2.01	4.26								
65	57.0	1.11	1.53	35.6	1.25	2.17	23.9	1.43	2.83	19.2	1.53	3.29	14.6	1.73	3.81	11.2	1.98	4.33	9.3	2.22	4.66					
70	61.3	1.11	1.53	38.3	1.25	2.17	25.7	1.43	2.84	20.7	1.53	3.27	15.6	1.71	3.90	12.0	1.96	4.40	10.0	2.21	4.69					
75	65.6	1.11	1.53	41.0	1.25	2.18	27.5	1.43	2.84	22.1	1.53	3.31	16.7	1.71	3.90	12.8	1.95	4.46	10.7	2.21	4.71					
80	69.8	1.11	1.54	43.7	1.25	2.18	29.3	1.42	2.85	23.6	1.53	3.29	17.8	1.71	3.91	13.7	1.96	4.42	11.3	2.16	4.85					
90	78.5	1.11	1.54	49.1	1.25	2.18	32.9	1.42	2.87	26.5	1.53	3.31	20.0	1.70	3.93	15.3	1.93	4.52	12.7	2.16	4.87	10.6	2.42	5.20		
100	87.1	1.11	1.54	54.5	1.25	2.18	36.6	1.43	2.85	29.4	1.52	3.32	22.2	1.70	3.94	17.0	1.93	4.52	14.1	2.15	4.89	11.7	2.39	5.31		
110	95.6	1.11	1.54	59.9	1.25	2.18	40.2	1.42	2.86	32.3	1.52	3.33	24.4	1.70	3.94	18.7	1.93	4.52	15.4	2.12	5.00	12.9	2.40	5.28	11.1	2.59	5.67
120	104.2	1.11	1.54	65.2	1.25	2.19	43.8	1.42	2.87	35.2	1.52	3.33	26.6	1.70	3.95	20.3	1.92	4.59	16.8	2.12	5.00	14.0	2.37	5.36	12.1	2.59	5.69
130	112.7	1.11	1.55	70.6	1.25	2.19	47.4	1.42	2.87	38.1	1.52	3.34	28.8	1.70	3.95	22.0	1.92	4.58	18.2	2.13	5.00	15.1	2.35	5.44	13.0	2.55	5.81
140	121.2	1.11	1.55	76.0	1.25	2.19	51.0	1.42	2.87	41.0	1.52	3.34	30.9	1.69	3.99	23.7	1.92	4.57	19.6	2.13	5.00	16.2	2.34	5.50	14.0	2.55	5.81
150	129.7	1.11	1.55	81.3	1.25	2.19	54.6	1.42	2.87	43.9	1.52	3.34	33.1	1.69	3.99	25.3	1.91	4.62	20.9	2.11	5.07	17.4	2.35	5.46	15.0	2.55	5.81
160	138.1	1.11	1.55	86.6	1.25	2.20	58.2	1.42	2.88	46.8	1.52	3.34	35.3	1.69	3.99	27.0	1.91	4.61	22.3	2.11	5.06	19.5	2.33	5.51	15.9	2.52	5.95
170	146.6	1.11	1.55	91.9	1.25	2.20	61.7	1.42	2.89	49.7	1.52	3.34	37.5	1.69	3.99	28.7	1.92	4.60	23.7	2.11	5.05	19.6	2.32	5.56	16.9	2.52	5.95
180	155.0	1.11	1.55	97.2	1.25	2.20	65.3	1.42	2.89	52.5	1.52	3.36	39.6	1.69	4.01	30.3	1.91	4.63	25.0	2.10	5.10	20.7	2.31	5.60	17.9	2.52	5.93
190	163.4	1.11	1.55	102.5	1.25	2.20	68.9	1.42	2.89	55.4	1.52	3.36	41.8	1.69	4.01	32.0	1.91	4.62	26.4	2.10	5.09	21.9	2.32	5.56	18.8	2.50	6.02
200	171.7	1.11	1.56	107.8	1.25	2.20	72.4	1.42	2.90	58.3	1.52	3.35	44.0	1.69	4.00	33.6	1.91	4.65	27.8	2.11	5.08	23.0	2.32	5.59	19.8	2.50	6.01
220	188.7	1.11	1.56	118.4	1.25	2.21	79.6	1.42	2.89	64.0	1.52	3.37	48.4	1.70	4.00	37.0	1.91	4.63	30.5	2.10	5.12	25.3	2.32	5.59	21.7	2.48	6.08
240	205.5	1.11	1.56	129.0	1.25	2.21	86.7	1.42	2.90	69.8	1.52	3.37	52.7	1.69	4.01	40.3	1.91	4.65	33.3	2.10	5.11	27.5	2.30	5.65	23.6	2.47	6.11
260	222.4	1.11	1.56	139.6	1.25	2.21	93.9	1.42	2.90	75.5	1.52	3.38	57.1	1.69	4.01	43.6	1.91	4.66	36.0	2.10	5.14	29.8	2.30	5.64	25.6	2.49	6.11
280	239.1	1.11	1.56	150.2	1.25	2.22	101.0	1.42	2.91	81.3	1.52	3.37	61.4	1.69	4.02	46.9	1.90	4.68	38.8	2.10	5.12	32.1	2.31	5.63	27.5	2.47	6.15
300	255.9	1.11	1.56	160.8	1.25	2.22	108.1	1.42	2.91	87.0	1.52	3.38	65.7	1.69	4.03	50.3	1.91	4.66	41.5	2.10	5.14	34.3	2.30	5.68	29.5	2.48	6.12

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

6- 684

R0071712

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 1.25 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	15.3	1.00	1.45	9.8	1.15	1.95	6.6	1.37	2.44																	
20	20.4	1.00	1.45	12.9	1.12	2.04	8.7	1.33	2.55	6.6	1.49	2.98														
25	25.4	0.99	1.47	16.1	1.12	2.05	10.8	1.31	2.61	8.2	1.47	3.00	6.7	1.62	3.18											
30	30.5	1.00	1.46	19.3	1.12	2.06	12.9	1.30	2.66	9.7	1.43	3.20	7.9	1.56	3.58											
35	35.5	0.99	1.47	22.5	1.12	2.06	15.0	1.29	2.68	11.3	1.42	3.22	9.2	1.55	3.62	7.2	1.78	4.02								
40	40.5	0.99	1.47	25.7	1.12	2.06	17.1	1.28	2.70	12.9	1.42	3.24	10.5	1.55	3.64	8.2	1.77	4.07								
45	45.5	0.99	1.48	28.8	1.11	2.08	19.2	1.28	2.72	14.4	1.40	3.31	11.7	1.52	3.75	9.1	1.72	4.25								
50	50.4	0.99	1.49	32.0	1.12	2.08	21.1	1.28	2.73	16.0	1.40	3.31	13.0	1.52	3.75	10.1	1.71	4.27	8.3	1.95	4.57					
55	55.4	0.99	1.48	35.1	1.11	2.09	23.4	1.28	2.74	17.6	1.40	3.31	14.3	1.52	3.75	11.1	1.71	4.23	9.1	1.93	4.63					
60	60.3	0.99	1.49	38.3	1.12	2.09	25.5	1.28	2.74	19.1	1.39	3.30	15.6	1.52	3.75	12.1	1.71	4.30	9.9	1.92	4.67					
65	65.2	0.99	1.49	41.4	1.11	2.10	27.6	1.28	2.74	20.7	1.39	3.35	16.8	1.51	3.81	13.0	1.68	4.41	10.6	1.86	4.84	8.7	2.18	5.06		
70	70.1	0.99	1.50	44.6	1.12	2.09	29.7	1.28	2.75	22.3	1.39	3.35	18.1	1.51	3.80	14.0	1.68	4.41	11.4	1.87	4.86	9.3	2.15	5.18		
75	75.0	0.99	1.50	47.7	1.12	2.09	31.8	1.28	2.75	23.8	1.39	3.38	19.4	1.51	3.80	15.0	1.68	4.40	12.2	1.87	4.88	9.9	2.12	5.28		
80	79.9	0.99	1.50	50.8	1.12	2.10	33.8	1.27	2.77	25.4	1.39	3.37	20.6	1.50	3.84	16.0	1.69	4.40	13.0	1.87	4.89	10.5	2.10	5.32	8.1	2.31	5.51
90	89.7	0.99	1.50	57.1	1.12	2.10	38.0	1.27	2.77	28.5	1.38	3.39	23.2	1.51	3.83	17.9	1.67	4.48	14.6	1.86	4.92	11.8	2.09	5.40	9.3	2.31	5.59
100	99.6	0.99	1.50	63.3	1.11	2.11	42.2	1.27	2.77	31.7	1.39	3.38	25.7	1.50	3.86	19.9	1.67	4.47	16.2	1.85	4.94	13.1	2.09	5.42	11.4	2.29	5.68
110	109.4	0.99	1.50	69.6	1.12	2.11	46.4	1.27	2.77	34.8	1.39	3.39	28.3	1.50	3.85	21.9	1.67	4.46	17.8	1.85	4.96	14.4	2.09	5.43	12.5	2.25	5.98
120	119.1	0.99	1.51	75.8	1.12	2.11	50.5	1.27	2.78	37.9	1.38	3.41	30.8	1.50	3.87	23.8	1.66	4.51	19.3	1.83	5.05	15.6	2.06	5.55	13.5	2.23	5.91
130	128.9	1.00	1.51	82.0	1.12	2.11	54.7	1.27	2.78	41.1	1.39	3.39	33.3	1.49	3.89	25.8	1.67	4.50	20.9	1.83	5.05	16.9	2.06	5.55	14.6	2.22	5.95
140	138.6	1.00	1.51	88.2	1.12	2.12	58.8	1.27	2.79	44.2	1.39	3.40	35.9	1.50	3.87	27.8	1.67	4.48	22.5	1.83	5.06	18.2	2.06	5.55	15.7	2.22	5.97
150	148.2	1.00	1.51	94.4	1.12	2.12	63.0	1.27	2.78	47.3	1.39	3.41	38.4	1.50	3.88	29.7	1.66	4.52	24.1	1.83	5.06	19.4	2.04	5.53	16.8	2.21	6.00
160	157.9	1.00	1.51	100.6	1.12	2.12	67.1	1.27	2.79	50.4	1.39	3.41	40.9	1.50	3.89	31.7	1.67	4.51	25.7	1.83	5.06	20.7	2.05	5.62	17.9	2.21	6.01
170	167.5	1.00	1.51	106.7	1.12	2.12	71.2	1.27	2.79	53.5	1.39	3.41	43.4	1.49	3.90	33.6	1.66	4.53	27.3	1.83	5.06	22.0	2.05	5.62	19.0	2.21	6.03
180	177.1	1.00	1.51	112.9	1.12	2.12	75.3	1.27	2.80	56.6	1.39	3.42	46.0	1.50	3.88	35.6	1.67	4.52	28.9	1.84	5.05	23.3	2.05	5.61	20.1	2.21	6.05
190	186.6	1.00	1.52	119.0	1.12	2.12	79.4	1.27	2.80	59.7	1.39	3.42	48.5	1.50	3.89	37.5	1.66	4.54	30.4	1.83	5.10	24.5	2.06	5.67	21.2	2.20	6.05
200	196.1	1.00	1.52	125.1	1.12	2.13	83.5	1.27	2.80	62.8	1.39	3.42	51.0	1.50	3.90	39.5	1.67	4.52	32.0	1.83	5.09	25.8	2.04	5.66	22.3	2.20	6.04
220	215.4	1.00	1.52	137.4	1.12	2.13	91.8	1.27	2.80	69.0	1.39	3.42	56.0	1.50	3.91	43.4	1.67	4.53	35.2	1.83	5.09	28.3	2.03	5.70	25.5	2.20	6.08
240	234.7	1.00	1.52	149.8	1.12	2.13	100.0	1.27	2.81	75.2	1.39	3.41	61.1	1.50	3.90	47.3	1.67	4.54	38.4	1.83	5.09	30.9	2.04	5.69	28.7	2.20	6.10
260	253.8	1.00	1.52	162.0	1.12	2.13	108.2	1.27	2.81	81.4	1.39	3.41	66.1	1.50	3.91	51.2	1.66	4.55	41.5	1.83	5.12	33.4	2.03	5.72	31.8	2.19	6.18
280	273.0	1.00	1.52	174.3	1.12	2.13	116.4	1.27	2.81	87.6	1.39	3.41	71.1	1.50	3.92	55.1	1.67	4.55	44.7	1.81	5.11	36.0	2.03	5.70	31.0	2.16	6.15
300	292.0	1.00	1.53	186.5	1.12	2.14	124.6	1.27	2.82	91.7	1.39	3.44	76.2	1.50	3.91	59.0	1.67	4.55	47.8	1.82	5.13	38.5	2.03	5.73	33.2	2.16	6.17

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

(Sheet 5 of 10)

R0071713

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 1.50 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	17.0	0.92	1.42	11.3	1.05	1.86	7.6	1.20	2.41																	
20	22.7	0.92	1.41	14.9	1.03	1.93	10.0	1.17	2.53	7.0	1.40	3.01	5.7	1.52	3.39											
25	28.3	0.92	1.42	18.6	1.03	1.94	12.4	1.15	2.59	8.6	1.35	3.19	7.0	1.46	3.60											
30	33.9	0.92	1.43	22.3	1.03	1.94	14.9	1.15	2.59	10.3	1.34	3.22	8.4	1.46	3.62	6.9	1.59	4.03								
35	39.5	0.92	1.43	26.0	1.03	1.95	17.3	1.14	2.62	11.9	1.31	3.32	9.7	1.43	3.74	8.0	1.56	4.13								
40	45.0	0.92	1.44	29.7	1.03	1.94	19.8	1.15	2.61	13.6	1.31	3.32	11.1	1.43	3.73	9.1	1.55	4.20	7.1	1.79	4.64					
45	50.5	0.92	1.44	33.3	1.02	1.96	22.2	1.14	2.63	15.2	1.30	3.39	12.4	1.41	3.81	10.2	1.54	4.25	8.0	1.79	4.63					
50	56.1	0.92	1.44	37.0	1.03	1.95	24.6	1.14	2.65	16.9	1.30	3.38	13.7	1.39	3.88	11.3	1.53	4.29	8.8	1.75	4.78					
55	61.5	0.92	1.45	40.6	1.02	1.96	27.1	1.14	2.64	18.6	1.30	3.37	15.1	1.40	3.86	12.4	1.52	4.32	9.6	1.73	4.91	8.2	1.93	5.14		
60	67.0	0.92	1.45	44.2	1.02	1.97	29.5	1.14	2.65	20.2	1.29	3.41	16.4	1.39	3.91	13.5	1.52	4.35	10.5	1.73	4.88	8.9	1.91	5.21		
65	72.5	0.92	1.45	47.8	1.02	1.98	31.9	1.14	2.66	21.9	1.30	3.40	17.8	1.40	3.88	14.6	1.51	4.37	11.3	1.71	4.92	9.6	1.89	5.30		
70	77.9	0.92	1.45	51.4	1.02	1.98	34.3	1.14	2.66	23.5	1.29	3.43	19.1	1.39	3.92	15.7	1.51	4.39	12.2	1.72	4.94	10.3	1.88	5.36	8.9	2.11	5.55
75	83.3	0.92	1.46	55.0	1.02	1.98	36.7	1.14	2.67	25.2	1.29	3.42	20.5	1.40	3.89	16.8	1.51	4.40	13.0	1.70	5.02	11.0	1.87	5.41	9.5	2.11	5.61
80	88.7	0.92	1.46	58.6	1.02	1.98	39.1	1.14	2.67	26.8	1.29	3.44	21.8	1.39	3.93	17.9	1.50	4.41	13.9	1.71	4.98	11.7	1.86	5.46	9.9	2.08	5.84
90	99.6	0.92	1.46	65.8	1.02	1.99	44.0	1.14	2.66	30.1	1.29	3.46	24.5	1.39	3.91	20.1	1.50	4.43	15.6	1.71	5.02	13.2	1.87	5.42	11.1	2.06	5.90
100	110.5	0.92	1.46	73.0	1.02	1.99	48.8	1.14	2.67	33.4	1.29	3.47	27.2	1.39	3.94	22.3	1.50	4.45	17.3	1.70	5.05	14.6	1.85	5.50	12.3	2.04	5.97
110	121.4	0.92	1.46	80.2	1.02	1.99	53.6	1.14	2.68	36.7	1.28	3.47	29.9	1.39	3.94	24.5	1.50	4.46	19.0	1.70	5.07	16.0	1.84	5.50	13.5	2.04	5.98
120	132.2	0.92	1.46	87.3	1.02	2.00	58.4	1.14	2.68	40.0	1.28	3.48	32.6	1.39	3.95	26.7	1.49	4.47	20.7	1.69	5.09	17.5	1.85	5.52	14.7	2.03	6.03
130	142.9	0.92	1.47	94.5	1.02	2.00	63.2	1.14	2.68	43.3	1.29	3.48	35.3	1.39	3.94	28.9	1.49	4.48	22.4	1.69	5.10	18.9	1.84	5.57	15.9	2.03	6.06
140	153.6	0.92	1.47	101.6	1.02	2.00	68.0	1.14	2.69	46.6	1.29	3.48	37.9	1.38	3.97	31.1	1.49	4.48	24.0	1.68	5.10	20.3	1.83	5.61	17.1	2.02	6.10
150	164.3	0.92	1.47	108.7	1.03	2.00	72.8	1.14	2.68	49.9	1.29	3.48	40.6	1.39	3.97	33.3	1.49	4.49	25.7	1.68	5.16	21.7	1.82	5.64	18.3	2.01	6.13
160	175.0	0.92	1.47	115.7	1.02	2.01	77.6	1.14	2.68	53.2	1.29	3.48	43.3	1.39	3.97	35.5	1.50	4.49	27.4	1.68	5.19	23.2	1.83	5.60	19.5	1.99	6.12
170	185.6	0.92	1.48	122.8	1.03	2.01	82.3	1.14	2.69	56.4	1.29	3.49	45.9	1.38	3.99	37.7	1.50	4.49	29.1	1.68	5.19	24.6	1.83	5.63	20.7	1.99	6.11
180	196.2	0.92	1.48	129.8	1.02	2.01	87.1	1.14	2.69	59.7	1.29	3.49	48.6	1.39	3.98	39.8	1.49	4.52	30.8	1.68	5.19	26.0	1.82	5.61	21.9	1.99	6.11
190	206.7	0.92	1.48	136.8	1.03	2.02	91.8	1.14	2.69	62.9	1.29	3.50	51.3	1.39	3.97	42.0	1.49	4.52	32.5	1.68	5.18	27.4	1.82	5.68	23.1	1.99	6.15
200	217.2	0.92	1.48	143.8	1.03	2.02	96.5	1.14	2.70	66.2	1.29	3.49	53.9	1.39	3.99	44.2	1.49	4.51	34.2	1.68	5.18	28.9	1.83	5.65	24.3	1.98	6.16
220	238.5	0.92	1.48	157.9	1.03	2.02	106.0	1.14	2.70	72.7	1.29	3.50	59.3	1.39	3.98	48.6	1.50	4.51	37.6	1.68	5.19	31.7	1.82	5.68	26.7	1.97	6.15
240	259.7	0.92	1.49	172.0	1.03	2.02	115.6	1.15	2.70	79.3	1.29	3.50	64.6	1.39	3.99	53.0	1.50	4.51	40.9	1.67	5.23	34.6	1.82	5.67	29.1	1.97	6.19
260	280.9	0.92	1.49	186.1	1.03	2.03	125.0	1.15	2.71	85.8	1.29	3.51	69.9	1.39	3.99	57.3	1.49	4.53	44.3	1.68	5.22	37.4	1.82	5.70	31.5	1.96	6.20
280	302.0	0.92	1.49	200.1	1.03	2.03	134.5	1.15	2.71	92.3	1.29	3.51	75.2	1.39	4.00	61.7	1.50	4.53	47.7	1.68	5.22	40.3	1.82	5.69	33.9	1.96	6.21
300	323.0	0.93	1.49	214.1	1.03	2.03	143.9	1.15	2.71	98.8	1.29	3.51	80.5	1.39	4.00	66.0	1.49	4.54	51.1	1.68	5.21	43.1	1.82	5.71	36.3	1.96	6.21

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

6- 686

R0071714

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 1.75 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	18.5	0.87	1.38	12.1	0.97	1.89	8.5	1.08	2.40	5.9	1.28	2.92														
20	24.5	0.86	1.41	16.1	0.96	1.91	11.3	1.07	2.43	7.8	1.25	3.03	6.5	1.34	3.38											
25	30.6	0.86	1.41	20.1	0.96	1.91	14.1	1.07	2.45	9.7	1.23	3.09	8.1	1.33	3.43	6.6	1.46	3.81								
30	36.7	0.86	1.40	24.1	0.96	1.92	16.8	1.06	2.50	11.6	1.22	3.13	9.6	1.29	3.57	7.8	1.41	4.01								
35	42.7	0.86	1.41	28.1	0.96	1.92	19.6	1.06	2.50	13.4	1.20	3.23	11.2	1.29	3.58	9.1	1.41	4.02	7.1	1.59	4.57					
40	48.7	0.86	1.42	32.0	0.96	1.93	22.4	1.06	2.50	15.3	1.20	3.24	12.7	1.27	3.67	10.3	1.38	4.15	8.1	1.58	4.61					
45	54.7	0.86	1.42	36.0	0.96	1.93	25.1	1.05	2.51	17.2	1.20	3.24	14.3	1.28	3.66	11.6	1.39	4.14	9.1	1.57	4.6[illegible]	7.5	1.71	5.12		
50	60.7	0.86	1.42	39.9	0.96	1.94	27.9	1.06	2.52	19.1	1.20	3.25	15.8	1.26	3.72	12.8	1.37	4.22	10.0	1.54	4.80	8.3	1.71	5.20		
55	66.6	0.86	1.42	43.8	0.96	1.94	30.6	1.05	2.53	21.0	1.20	3.25	17.4	1.27	3.70	14.1	1.37	4.21	11.0	1.54	4.80	9.1	1.70	5.25	7.5	1.91	5.65
60	72.5	0.86	1.43	47.7	0.96	1.95	33.3	1.05	2.55	22.8	1.19	3.29	18.9	1.26	3.75	15.4	1.38	4.19	12.0	1.54	4.81	9.9	1.69	5.30	8.2	1.92	5.63
65	78.4	0.86	1.43	51.6	0.96	1.95	36.1	1.06	2.54	24.7	1.19	3.28	20.5	1.26	3.73	16.6	1.37	4.25	12.9	1.52	4.92	10.7	1.68	5.34	8.8	1.85	5.79
70	84.3	0.86	1.43	55.5	0.96	1.95	38.8	1.05	2.54	26.6	1.19	3.28	22.0	1.26	3.76	17.9	1.37	4.23	13.9	1.52	4.91	11.5	1.68	5.39	9.5	1.84	5.75
75	90.2	0.86	1.43	59.4	0.96	1.95	41.5	1.05	2.55	28.5	1.20	3.27	23.6	1.26	3.75	19.1	1.36	4.28	14.9	1.52	4.90	12.3	1.67	5.40	10.1	1.83	5.69
80	96.0	0.86	1.43	63.2	0.96	1.96	44.2	1.05	2.56	30.3	1.19	3.30	25.1	1.26	3.77	20.4	1.37	4.25	15.9	1.51	4.83	13.1	1.67	5.43	10.8	1.83	5.83
90	107.8	0.86	1.44	71.0	0.96	1.96	49.7	1.05	2.55	34.1	1.19	3.29	28.2	1.26	3.78	22.9	1.37	4.28	17.8	1.51	4.96	14.7	1.66	5.42	12.1	1.81	5.93
100	119.5	0.86	1.44	78.8	0.96	1.96	55.1	1.05	2.56	37.8	1.19	3.31	31.3	1.26	3.79	25.4	1.36	4.30	19.8	1.52	4.94	16.3	1.65	5.51	13.4	1.85	5.93
110	131.2	0.86	1.44	86.5	0.96	1.97	60.5	1.05	2.57	41.5	1.19	3.32	34.4	1.26	3.79	27.9	1.36	4.31	21.7	1.51	4.99	17.9	1.65	5.53	14.7	1.84	6.08
120	142.9	0.86	1.44	94.2	0.96	1.97	65.9	1.05	2.58	45.3	1.19	3.31	37.5	1.26	3.79	30.4	1.36	4.32	23.7	1.51	4.97	19.5	1.65	5.55	16.0	1.84	6.09
130	154.5	0.86	1.45	101.9	0.96	1.97	71.3	1.05	2.56	49.0	1.19	3.31	40.6	1.26	3.79	32.9	1.36	4.33	25.6	1.51	5.01	21.1	1.65	5.57	17.3	1.82	6.12
140	166.1	0.87	1.45	109.6	0.96	1.97	76.7	1.05	2.55	52.7	1.19	3.32	43.7	1.26	3.79	35.4	1.36	4.33	27.6	1.51	4.99	22.7	1.66	5.54	18.6	1.82	6.15
150	177.6	0.87	1.45	117.2	0.96	1.98	82.1	1.05	2.56	56.4	1.19	3.32	46.8	1.26	3.77	37.9	1.36	4.33	29.5	1.51	5.02	24.3	1.66	5.57	19.9	1.82	6.17
160	189.1	0.87	1.45	124.8	0.96	1.98	87.5	1.06	2.56	60.1	1.19	3.33	49.8	1.26	3.81	40.4	1.36	4.33	31.4	1.50	5.04	25.9	1.66	5.60	21.3	1.83	6.18
170	200.5	0.87	1.45	132.4	0.96	1.98	92.8	1.05	2.58	63.7	1.19	3.34	52.9	1.26	3.80	42.9	1.36	4.33	33.4	1.51	5.02	27.5	1.66	5.60	22.6	1.83	6.21
180	211.9	0.87	1.46	140.0	0.96	1.98	98.1	1.05	2.59	67.4	1.19	3.34	55.9	1.26	3.82	45.4	1.36	4.33	35.3	1.51	5.04	29.1	1.66	5.61	23.9	1.83	6.21
190	223.3	0.87	1.46	147.5	0.96	1.99	103.4	1.05	2.59	71.1	1.19	3.34	59.0	1.26	3.81	47.9	1.36	4.33	37.2	1.51	5.04	30.7	1.66	5.61	25.3	1.83	6.22
200	234.6	0.87	1.46	155.1	0.97	1.99	108.7	1.05	2.60	74.7	1.19	3.35	62.0	1.26	3.82	50.4	1.36	4.35	39.2	1.51	5.03	32.3	1.66	5.63	26.5	1.83	6.23
220	257.0	0.87	1.46	170.3	0.96	1.99	119.[illegible]	1.05	2.60	82.1	1.19	3.35	68.1	1.26	3.83	55.4	1.36	4.35	43.1	1.51	5.03	35.5	1.66	5.63	29.1	1.83	6.24
240	280.[illegible]	0.87	1.47	185.5	0.97	1.99	130.1	1.06	2.60	89.5	1.19	3.35	74.3	1.26	3.82	60.4	1.36	4.35	47.0	1.51	5.03	38.7	1.66	5.63	31.7	1.83	6.24
260	303.2	0.87	1.47	[illegible]	0.97	2.00	140.8	1.06	2.61	96.9	1.19	3.35	80.4	1.26	3.82	65.2	1.36	4.37	50.8	1.51	5.00	41.9	1.66	5.63	34.3	1.83	6.24
280	326.0	0.87	1.47	215.7	0.97	2.00	151.[illegible]	1.06	2.61	104.[illegible]	1.19	3.36	86.5	1.26	3.83	70.2	1.36	4.36	54.7	1.51	5.05	45.1	1.66	5.63	36.9	1.83	6.25
300	348.6	0.87	1.47	230.6	0.97	2.00	162.0	1.06	2.61	111.[illegible]	1.19	3.36	92.[illegible]	1.27	3.85	75.[illegible]	1.36	4.36	58.[illegible]	1.51	5.05	48.1	1.66	5.63	39.[illegible]	1.83	6.25

Exhibit [illegible] Parameters Necessary to Plot
Retardance "D" and "C"

(Sheet 7 of 14)

6-687

R0071715

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 2.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	20.8	0.81	1.32	12.8	0.91	1.90	9.3	1.00	2.37	6.7	1.15	2.85															
20	27.6	0.80	1.33	17.1	0.91	1.89	12.3	0.99	2.43	8.8	1.12	3.00	6.5	1.29	3.51	[illegible]	[illegible]	[illegible]									
25	34.5	0.81	1.33	21.3	0.91	1.91	15.4	0.99	2.43	11.0	1.11	3.01	8.0	1.25	3.69	6.7	1.38	3.96									
30	41.3	0.81	1.34	25.5	0.91	1.92	18.4	0.98	2.46	13.2	1.11	3.02	9.6	1.24	3.71	7.9	1.33	4.20	6.6	1.49	5.48						
35	48.0	0.80	1.35	29.7	0.91	1.93	21.5	0.99	2.44	15.3	1.10	3.08	11.1	1.22	3.82	9.2	1.43	[illegible]	7.6	1.45	5.48						
40	54.8	0.80	1.34	33.9	0.91	1.93	24.5	0.98	2.46	17.5	1.10	3.07	12.7	1.22	3.81	10.5	1.32	[illegible]	8.7	1.45	[illegible]	7.2	1.65	[illegible]			
45	61.5	0.80	1.35	38.1	0.91	1.93	27.5	0.98	2.47	19.6	1.10	3.11	14.3	1.23	3.86	11.9	1.32	[illegible]	9.7	1.43	[illegible]	8.0	1.61	5.16			
50	68.2	0.80	1.35	42.3	0.91	1.93	30.5	0.98	2.48	21.8	1.10	3.09	15.8	1.22	3.86	13.1	1.32	[illegible]	10.6	1.42	4.78	8.8	1.57	5.33	[illegible]	[illegible]	[illegible]
55	74.9	0.81	1.35	46.4	0.91	1.94	33.5	0.98	2.48	23.9	1.09	3.12	17.4	1.22	3.84	14.4	1.32	[illegible]	11.8	1.42	[illegible]	9.7	1.58	5.40	[illegible]	[illegible]	[illegible]
60	81.5	0.81	1.36	50.6	0.91	1.93	36.5	0.98	2.49	26.1	1.10	3.10	18.9	1.21	3.89	15.6	1.30	[illegible]	12.9	1.42	[illegible]	10.6	1.59	5.26	[illegible]	[illegible]	[illegible]
65	88.1	0.81	1.36	54.7	0.91	1.94	39.5	0.98	2.49	28.2	1.10	3.12	20.5	1.22	3.87	16.9	1.30	4.38	13.9	1.41	[illegible]	11.4	1.56	5.40	9.7	[illegible]	[illegible]
70	94.7	0.81	1.36	58.8	0.91	1.94	42.5	0.98	2.49	30.3	1.09	3.14	22.0	1.21	3.90	18.2	1.31	[illegible]	15.0	1.42	[illegible]	12.3	1.57	5.37	[illegible]	[illegible]	[illegible]
75	101.2	0.81	1.36	62.9	0.91	1.94	45.5	0.99	2.49	32.4	1.09	3.15	23.6	1.22	[illegible]	19.5	1.31	[illegible]	16.0	1.41	[illegible]	13.1	1.55	5.31	11.1	[illegible]	[illegible]
80	107.8	0.81	1.36	67.0	0.91	1.95	48.4	0.98	2.50	34.6	1.10	3.13	25.1	1.21	[illegible]	20.7	1.30	[illegible]	17.1	1.41	[illegible]	13.9	1.56	[illegible]	11.8	[illegible]	[illegible]
90	121.0	0.81	1.37	75.2	0.91	1.95	54.4	0.98	2.50	38.8	1.09	3.15	28.2	1.21	[illegible]	23.3	1.30	[illegible]	19.2	1.41	[illegible]	15.7	1.55	5.46	[illegible]	[illegible]	[illegible]
100	134.2	0.81	1.37	83.4	0.91	1.96	60.4	0.99	2.50	43.1	1.10	3.15	31.1	1.21	[illegible]	25.9	1.30	[illegible]	21.3	1.41	[illegible]	17.4	1.55	5.52	[illegible]	[illegible]	[illegible]
110	147.3	0.81	1.37	91.6	0.91	1.96	66.3	0.98	2.51	47.4	1.10	3.15	[illegible]	1.21	[illegible]	28.4	1.30	[illegible]	23.4	1.40	[illegible]	19.1	1.54	5.55	[illegible]	[illegible]	[illegible]
120	160.3	0.81	1.38	99.8	0.91	1.96	72.2	0.98	2.51	51.6	1.10	3.16	33.5	1.21	[illegible]	31.0	1.30	[illegible]	25.5	1.40	[illegible]	20.8	1.54	5.58	[illegible]	[illegible]	[illegible]
130	173.3	0.81	1.38	107.9	0.91	1.96	78.1	0.98	2.51	55.8	1.09	3.17	40.6	1.21	3.93	33.5	1.30	[illegible]	27.6	1.40	5.08	22.5	1.53	5.61	[illegible]	[illegible]	[illegible]
140	186.3	0.81	1.38	116.0	0.91	1.97	84.0	0.99	2.52	60.1	1.10	3.16	43.6	1.21	1.96	36.0	1.29	[illegible]	29.7	1.39	5.08	24.2	1.53	5.64	[illegible]	[illegible]	[illegible]
150	199.2	0.81	1.38	124.1	0.91	1.97	89.9	0.99	2.52	64.3	1.10	3.16	46.7	1.21	1.96	38.6	1.30	[illegible]	31.8	1.39	5.08	[illegible]	1.53	5.64	[illegible]	[illegible]	[illegible]
160	212.0	0.81	1.38	132.1	0.91	1.97	95.7	0.99	2.52	68.5	1.10	3.17	49.8	1.21	[illegible]	41.1	1.30	[illegible]	33.8	1.40	5.05	[illegible]	1.53	5.64	[illegible]	[illegible]	[illegible]
170	224.8	0.91	1.39	140.2	0.91	1.97	101.6	0.99	2.52	72.7	1.10	3.17	52.8	1.21	1.97	43.6	1.30	[illegible]	35.9	1.40	5.05	29	1.53	5.65	[illegible]	[illegible]	[illegible]
180	237.5	0.81	1.39	148.2	0.91	1.98	107.4	0.99	2.53	76.8	1.10	3.18	55.9	1.21	1.98	46.2	1.30	[illegible]	38.0	1.40	5.04	[illegible]	1.53	5.65	[illegible]	[illegible]	[illegible]
190	250.2	0.81	1.39	156.1	0.91	1.98	113.2	0.99	2.53	81.0	1.10	3.18	58.9	1.21	1.97	48.7	1.30	[illegible]	40.1	1.40	5.04	[illegible]	1.53	5.65	[illegible]	[illegible]	[illegible]
200	262.8	0.81	1.39	164.1	0.91	1.98	119.0	0.99	2.53	85.2	1.10	3.18	61.9	1.21	[illegible]	51.2	1.30	[illegible]	42.2	1.40	5.03	[illegible]	1.53	5.66	[illegible]	[illegible]	[illegible]
220	288.5	0.81	1.40	180.2	0.91	1.99	130.7	0.99	2.54	93.6	1.10	3.18	68.1	1.21	1.97	56.1	1.30	[illegible]	46.3	1.40	5.04	32.1	1.53	5.66	[illegible]	[illegible]	[illegible]
240	314.1	0.81	1.40	196.2	0.91	1.99	142.4	0.99	2.54	102.0	1.10	3.19	74.2	1.21	1.98	61.1	1.30	[illegible]	50.5	1.40	5.06	41.2	1.53	5.68	[illegible]	[illegible]	[illegible]
260	339.5	0.81	1.40	212.2	0.91	1.99	154.6	0.99	2.54	110.3	1.10	3.20	80.1	1.21	1.98	66.4	1.30	[illegible]	54.7	1.40	5.05	[illegible]	1.53	5.68	[illegible]	[illegible]	[illegible]
280	364.9	0.81	1.40	228.2	0.92	1.99	165.6	0.99	2.55	118.7	1.10	3.19	86.1	1.21	[illegible]	71.4	1.30	[illegible]	58.8	1.40	5.04	[illegible]	1.53	5.68	[illegible]	[illegible]	[illegible]
300	390.2	0.81	1.40	244.1	0.92	2.00	177.2	0.99	2.55	127.0	1.10	3.20	[illegible]	1.21	[illegible]	76.4	1.30	[illegible]	63.0	1.40	5.06	[illegible]	1.53	5.68	[illegible]	[illegible]	[illegible]

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

(Sheet 8 of 14)

R0071716

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 1.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	23.6	0.69	1.35	15.3	0.78	1.80	11.4	0.83	2.33	8.8	0.90	2.77	6.5	1.01	3.37	5.0	1.16	3.78									
20	31.4	0.69	1.36	21.7	0.76	1.81	15.2	0.83	2.34	11.7	0.90	2.81	8.6	0.99	3.48	6.6	1.11	3.94	5.9	1.19	4.17						
25	39.2	0.69	1.36	27.0	0.75	1.83	19.0	0.83	2.33	14.6	0.90	2.83	10.8	0.99	3.44	8.1	1.09	4.15	7.3	1.16	4.33	6.6	1.27	4.80			
30	46.9	0.69	1.37	32.4	0.75	1.82	22.7	0.83	2.36	17.4	0.88	2.89	12.9	0.98	3.49	9.7	1.08	4.23	8.7	1.15	4.44	7.1	1.24	5.03	5.8	1.33	5.37
35	54.6	0.69	1.37	37.7	0.75	1.83	26.4	0.83	2.38	20.3	0.89	2.88	15.0	0.98	3.53	11.3	1.08	4.25	10.1	1.13	4.51	8.3	1.24	5.02	6.7	1.38	5.55
40	62.2	0.69	1.37	43.0	0.75	1.93	30.2	0.83	2.37	23.2	0.89	2.88	17.1	0.98	3.55	12.9	1.08	4.26	11.5	1.13	4.57	9.4	1.22	5.17	7.6	1.36	5.72
45	69.9	0.70	1.37	48.3	0.75	1.83	33.9	0.83	2.37	26.0	0.88	2.90	19.2	0.97	3.57	14.5	1.08	4.27	12.9	1.12	4.61	10.6	1.22	5.14	8.5	1.34	5.91
50	77.4	0.69	1.38	53.5	0.75	1.84	37.6	0.83	2.38	28.9	0.89	2.89	21.3	0.97	3.58	16.0	1.06	4.36	14.3	1.12	4.63	11.7	1.21	5.24	9.4	1.33	5.39
55	83.0	0.70	1.38	58.7	0.75	1.85	41.2	0.83	2.40	31.7	0.89	2.91	23.4	0.97	3.58	17.6	1.06	4.35	15.7	1.11	4.66	12.9	1.21	5.20	10.4	1.35	5.8
60	92.5	0.70	1.38	64.0	0.75	1.84	44.9	0.83	2.40	34.5	0.88	2.92	25.5	0.97	3.59	19.2	1.07	4.35	17.1	1.11	4.67	14.0	1.20	5.28	11.3	1.34	5.87
65	99.9	0.69	1.39	69.1	0.75	1.85	48.6	0.83	2.39	37.3	0.88	2.93	27.6	0.97	3.59	20.8	1.07	4.36	18.5	1.11	4.69	15.2	1.21	5.24	12.2	1.33	5.93
70	107.3	0.69	1.39	74.3	0.75	1.86	52.2	0.83	2.40	40.1	0.88	2.93	29.7	0.98	3.59	22.3	1.06	4.39	19.9	1.11	4.69	16.3	1.20	5.30	13.1	1.32	5.95
75	114.7	0.70	1.39	79.4	0.75	1.86	55.8	0.83	2.41	42.9	0.88	2.94	31.8	0.98	3.59	23.9	1.06	4.38	21.3	1.11	4.70	17.5	1.21	5.26	14.0	1.32	5.92
80	122.1	0.70	1.40	84.5	0.75	1.87	59.4	0.83	2.42	45.7	0.88	2.94	33.9	0.98	3.58	25.5	1.07	4.36	22.7	1.11	4.70	18.6	1.20	5.31	15.0	1.32	5.94
90	137.0	0.70	1.40	94.9	0.75	1.87	66.7	0.83	2.42	51.4	0.89	2.93	38.0	0.97	3.61	28.6	1.06	4.40	25.5	1.11	4.72	20.9	1.20	5.33	16.8	1.32	6.01
100	151.8	0.70	1.40	105.2	0.75	1.87	74.0	0.83	2.42	57.0	0.89	2.94	42.2	0.98	3.61	31.7	1.06	4.42	28.3	1.11	4.73	23.2	1.20	5.34	18.6	1.31	5.98
110	166.6	0.70	1.41	115.5	0.75	1.87	81.3	0.83	2.42	62.6	0.89	2.95	46.4	0.98	3.61	34.9	1.06	4.40	31.0	1.10	4.78	25.5	1.20	5.34	20.5	1.32	6.04
120	181.3	0.70	1.41	125.7	0.75	1.88	88.5	0.83	2.43	68.2	0.89	2.95	50.5	0.98	3.62	38.0	1.06	4.42	33.8	1.11	4.78	27.7	1.19	5.40	22.3	1.32	6.05
130	195.9	0.70	1.41	135.9	0.76	1.88	95.7	0.83	2.43	73.7	0.89	2.96	54.6	0.98	3.63	41.1	1.06	4.43	36.6	1.11	4.77	30.0	1.19	5.40	24.2	1.32	6.06
140	210.5	0.70	1.41	146.1	0.76	1.89	102.8	0.83	2.44	79.3	0.89	2.96	58.8	0.98	3.62	44.2	1.06	4.44	39.4	1.11	4.77	32.3	1.20	5.39	26.0	1.32	6.06
150	225.0	0.70	1.42	156.2	0.76	1.89	110.0	0.83	2.44	84.8	0.89	2.96	62.9	0.98	3.63	47.3	1.06	4.44	42.1	1.11	4.80	34.6	1.20	5.38	27.9	1.33	6.13
160	239.4	0.70	1.42	166.2	0.76	1.89	117.1	0.83	2.45	90.3	0.89	2.97	67.0	0.98	3.63	50.4	1.06	4.45	44.9	1.11	4.79	36.8	1.19	5.42	29.6	1.33	6.13
170	253.7	0.70	1.42	175.2	0.76	1.90	124.2	0.83	2.45	95.8	0.89	2.97	71.1	0.98	3.64	53.5	1.06	4.45	47.7	1.11	4.78	39.1	1.20	5.41	31.5	1.33	6.09
180	268.0	0.70	1.43	186.2	0.76	1.90	131.2	0.83	2.46	101.3	0.89	2.97	75.2	0.98	3.64	56.6	1.06	4.45	50.4	1.11	4.80	41.3	1.19	5.44	33.3	1.32	6.13
190	282.2	0.70	1.43	196.1	0.76	1.90	138.3	0.83	2.46	106.7	0.89	2.98	79.2	0.98	3.65	59.7	1.07	4.45	53.1	1.11	4.81	43.6	1.20	5.42	35.1	1.32	6.12
200	296.3	0.70	1.43	206.0	0.76	1.90	145.3	0.83	2.46	112.2	0.89	2.98	83.3	0.98	3.65	62.7	1.06	4.47	55.9	1.11	4.80	45.8	1.19	5.45	36.9	1.32	6.14
220	325.1	0.70	1.44	226.1	0.76	1.91	159.5	0.83	2.47	123.2	0.89	2.98	91.5	0.98	3.65	68.9	1.06	4.47	61.4	1.11	4.81	50.4	1.20	5.43	40.6	1.32	6.13
240	353.8	0.70	1.44	246.2	0.76	1.91	173.7	0.83	2.47	134.2	0.89	2.99	99.7	0.98	3.65	75.1	1.07	4.47	66.9	1.11	4.81	54.9	1.20	5.44	44.2	1.32	6.15
260	382.4	0.70	1.44	266.1	0.76	1.92	187.8	0.83	2.48	145.1	0.89	2.99	107.8	0.98	3.67	81.3	1.07	4.47	72.4	1.11	4.82	59.4	1.20	5.45	47.8	1.32	6.17
280	410.8	0.70	1.45	286.0	0.76	1.92	201.9	0.83	2.48	156.0	0.89	3.00	116.0	0.98	3.66	87.4	1.07	4.48	77.9	1.11	4.82	63.9	1.20	5.46	51.5	1.32	6.16
300	439.0	0.70	1.45	305.8	0.76	1.93	215.9	0.83	2.49	166.9	0.89	3.00	124.1	0.98	3.67	93.6	1.07	4.47	83.3	1.11	4.83	68.4	1.20	5.46	55.1	1.32	6.17

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

6- 689

R0071717

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 4.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	27.9	0.62	1.29	19.9	0.66	1.68	13.9	0.73	2.20	10.3	0.79	2.71	7.9	0.85	3.28	6.3	0.92	3.78	4.9	1.06	4.21						
20	37.1	0.62	1.29	26.5	0.66	1.69	18.5	0.72	2.21	13.2	0.78	2.76	10.5	0.84	3.33	8.4	0.92	3.81	6.4	1.01	4.57	5.5	1.09	4.89			
25	46.2	0.62	1.30	33.0	0.66	1.70	23.0	0.72	2.22	17.1	0.78	2.77	13.1	0.84	3.35	10.5	0.92	3.82	8.0	1.01	4.55	6.8	1.06	5.09	5.7	1.2	5.3.
30	55.3	0.62	1.30	39.5	0.66	1.70	27.6	0.72	2.23	20.4	0.77	2.82	15.7	0.85	3.36	12.5	0.91	3.92	9.5	0.99	4.21	8.2	1.07	5.01	6.7	1.15	5.21
35	64.3	0.62	1.31	46.0	0.66	1.71	32.1	0.72	2.25	23.8	0.78	2.91	18.3	0.85	3.37	14.6	0.91	3.90	11.1	0.99	4.20	9.5	1.08	5.15	7.8	1.15	5.11
40	73.3	0.62	1.31	52.4	0.66	1.71	36.6	0.72	2.25	27.1	0.77	2.93	20.8	0.83	3.42	16.6	0.90	3.96	12.7	1.00	4.68	10.8	1.04	5.25	8.9	1.1.	5.01
45	82.2	0.62	1.32	58.8	0.66	1.72	41.1	0.72	2.26	30.4	0.77	2.85	23.4	0.84	3.41	18.7	0.91	3.94	14.2	0.98	4.27	12.2	1.05	5.17	10.0	1.1.	5.11
50	91.1	0.62	1.32	65.2	0.66	1.72	45.6	0.72	2.25	33.7	0.77	2.85	26.0	0.85	3.40	20.7	0.99	3.97	15.8	0.93	4.24	13.5	1.05	5.25	11.1	1.1.	5.15
55	99.9	0.62	1.32	71.5	0.66	1.73	50.1	0.72	2.26	37.0	0.77	2.86	28.5	0.84	3.43	22.8	0.91	1.95	17.3	0.98	4.90	14.5	1.04	5.29	12.2	1.1.	
60	108.7	0.62	1.32	77.8	0.66	1.73	54.5	0.72	2.26	40.3	0.77	2.87	31.0	0.83	3.45	24.8	0.90		18.9	0.99	4.77	16.1	1.04	5.32	13.3	1.1.	
65	117.4	0.62	1.33	84.1	0.66	1.73	58.9	0.72	2.27	43.6	0.77	2.87	33.6	0.85	3.43	26.8	0.90	3.99	20.4	0.99	4.91	17.5	1.05	5.24	14.3	1.1.	
70	126.1	0.62	1.33	90.3	0.66	1.74	63.3	0.72	2.27	46.9	0.77	2.86	36.1	0.85	3.44	28.8	0.90	4.01	21.9	0.99	4.85	18.9	1.05	5.23	15.4	1.1.	
75	134.7	0.62	1.33	96.5	0.66	1.74	67.7	0.72	2.28	50.1	0.77	2.88	38.6	0.84	3.45	30.9	0.91	3.98	23.5	0.99	4.82	20.1	1.06	5.31	16.5	1.13	5.33
80	143.3	0.62	1.34	102.7	0.66	1.74	72.1	0.72	2.28	53.3	0.77	2.89	41.1	0.84	3.46	32.9	0.91	3.99	25.0	0.98	4.84	21.4	1.05	5.33	17.6	1.13	5.35
90	160.8	0.62	1.34	115.2	0.66	1.75	80.9	0.72	2.29	59.9	0.77	2.89	46.2	0.84	3.46	36.9	0.90	4.01	28.1	0.98	4.85	24.0	1.05	5.38	19.7	1.12	
100	178.2	0.62	1.34	127.7	0.66	1.75	89.7	0.72	2.29	66.4	0.77	2.90	51.2	0.84	3.47	41.0	0.91	4.00	31.2	0.98	4.85	26.7	1.05	5.35	21.9	1.12	4.95
110	195.4	0.62	1.35	140.1	0.66	1.76	98.5	0.72	2.29	72.9	0.77	2.90	56.2	0.84	3.48	45.0	0.90	4.02	34.1	0.98	4.85	29.3	1.06	5.37	24.1	1.12	4.93
120	212.6	0.62	1.35	152.5	0.66	1.76	107.2	0.72	2.30	79.4	0.77	2.90	61.2	0.85	3.49	49.0	0.90	4.03	37.3	0.98	4.88	31.9	1.05	5.30	26.2	1.12	4.99
130	229.6	0.62	1.35	164.8	0.66	1.76	115.9	0.72	2.30	85.9	0.77	2.91	66.2	0.84	3.49	53.0	0.90	4.03	40.4	0.99	4.87	34.6	1.05	5.37	28.4	1.12	4.92
140	246.6	0.62	1.36	177.0	0.66	1.77	124.5	0.72	2.30	92.3	0.77	2.91	71.2	0.84	3.49	57.0	0.90	4.04	43.4	0.98	4.90	37.2	1.04	5.38	30.5	1.12	4.99
150	263.5	0.62	1.36	189.1	0.66	1.77	133.2	0.73	2.30	98.7	0.77	2.92	76.2	0.85	3.49	61.0	0.91	4.05	46.5	0.99	4.88	39.8	1.04	5.39	32.7	1.12	4.98
160	280.3	0.62	1.36	201.2	0.66	1.78	141.7	0.73	2.31	105.1	0.77	2.92	81.1	0.84	3.50	65.0	0.91	4.04	49.5	0.98	4.90	42.4	1.04	5.40	34.8	1.12	4.91
170	296.9	0.62	1.37	213.3	0.67	1.78	150.3	0.73	2.31	111.5	0.78	2.92	86.0	0.84	3.51	68.9	0.91	4.05	52.5	0.98	4.91	45.0	1.04	5.40	36.9	1.12	4.93
180	313.5	0.62	1.37	225.1	0.67	1.78	158.8	0.73	2.32	117.8	0.78	2.93	90.9	0.84	3.52	72.9	0.91	4.05	55.6	0.98	4.90	47.6	1.04	5.40	39.1	1.12	4.91
190	330.0	0.62	1.37	237.2	0.67	1.79	167.3	0.73	2.32	124.2	0.78	2.93	95.8	0.84	3.52	76.8	0.91	4.05	58.6	0.98	4.90	50.2	1.04	5.40	41.2	1.12	4.92
200	346.4	0.62	1.37	249.1	0.67	1.79	175.7	0.73	2.32	130.5	0.78	2.93	100.7	0.84	3.52	80.7	0.91	4.07	61.6	0.98	4.91	52.7	1.04	5.41	43.3	1.12	4.94
220	380.0	0.62	1.38	273.3	0.67	1.79	192.9	0.73	2.33	143.3	0.78	2.93	110.6	0.85	3.53	88.7	0.91	4.07	67.6	0.98	4.91	57.9	1.04	5.44	47.6	1.12	4.95
240	413.3	0.62	1.38	297.4	0.67	1.80	209.9	0.73	2.33	156.0	0.78	2.94	120.4	0.84	3.53	96.6	0.91	4.07	73.7	0.98	4.93	63.1	1.04	5.44	51.9	1.12	4.96
260	446.5	0.62	1.39	321.4	0.67	1.80	227.0	0.73	2.33	168.7	0.78	2.94	130.2	0.84	3.54	104.5	0.91	4.08	79.7	0.98	4.93	68.3	1.04	5.45	56.2	1.12	4.93
280	479.5	0.62	1.39	345.3	0.67	1.80	243.9	0.73	2.34	181.3	0.78	2.95	140.0	0.84	3.54	112.3	0.91	4.09	85.8	0.99	4.93	73.5	1.04	5.44	60.5	1.12	4.95
300	512.3	0.62	1.39	369.0	0.67	1.81	260.8	0.73	2.34	193.9	0.78	2.95	149.8	0.84	3.55	120.2	0.91	4.09	91.8	0.99	4.94	78.6	1.04	5.45	64.7	1.12	4.96

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

(Sheet 10 of 14)

R0071718

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 5.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	29.3	0.57	1.33	21.1	0.60	1.74	15.0	0.66	2.23	12.2	0.70	2.58	9.0	0.75	3.25	7.2	0.83	3.70	5.8	0.93	4.09	4.6	0.99	4.81			
20	39.0	0.57	1.33	28.1	0.61	1.74	19.9	0.66	2.26	16.2	0.70	2.62	12.0	0.75	3.26	9.5	0.81	3.84	7.6	0.89	4.35	6.1	0.97	4.95	5.1	1.0[illegible]	5.2[illegible]
25	48.6	0.57	1.34	35.1	0.61	1.73	24.8	0.66	2.28	20.3	0.70	2.59	15.0	0.75	3.27	11.9	0.81	3.82	9.5	0.89	4.37	7.6	0.96	5.03	6.5	1.02	5.56
30	58.1	0.57	1.34	42.0	0.61	1.74	29.7	0.66	2.28	24.3	0.70	2.61	18.0	0.76	3.26	14.2	0.80	3.89	11.3	0.87	4.49	9.1	0.96	5.08	7.8	1.01	5.59
35	67.6	0.57	1.35	48.8	0.61	1.75	34.6	0.66	2.28	28.2	0.70	2.64	20.9	0.75	3.30	16.6	0.81	3.86	13.2	0.88	4.47	10.5	0.95	5.26	9.1	1.01	5.60
40	77.0	0.57	1.35	55.7	0.61	1.75	39.5	0.66	2.28	32.2	0.70	2.64	23.9	0.75	3.29	18.9	0.80	3.90	15.1	0.88	4.46	12.0	0.95	5.26	10.3	0.99	5.77
45	86.4	0.57	1.35	62.5	0.61	1.75	44.3	0.66	2.29	36.1	0.70	2.65	26.8	0.75	3.31	21.3	0.81	3.87	16.9	0.87	4.52	13.5	0.94	5.25	11.6	1.00	5.75
50	95.7	0.57	1.36	69.2	0.61	1.76	49.1	0.66	2.30	40.1	0.70	2.64	29.7	0.75	3.32	23.6	0.81	3.89	18.8	0.88	4.50	15.0	0.95	5.25	12.9	1.00	5.75
55	105.0	0.57	1.36	75.9	0.61	1.77	53.9	0.66	2.30	44.0	0.70	2.65	32.6	0.75	3.33	25.9	0.81	3.90	20.6	0.87	4.54	16.5	0.94	5.24	14.1	0.99	5.84
60	114.2	0.57	1.36	82.6	0.61	1.77	58.7	0.66	2.30	47.9	0.70	2.66	35.5	0.75	3.34	28.2	0.81	3.92	22.4	0.87	4.57	17.9	0.93	5.32	15.4	0.99	5.81
65	123.4	0.57	1.36	89.3	0.61	1.77	63.4	0.66	2.31	51.8	0.70	2.66	38.4	0.75	3.34	30.5	0.81	3.92	24.3	0.87	4.54	19.4	0.94	5.30	16.7	1.00	5.78
70	132.4	0.57	1.37	95.9	0.61	1.77	69.2	0.66	2.31	55.6	0.70	2.67	41.3	0.75	3.34	32.8	0.81	3.93	26.1	0.87	4.56	20.8	0.93	5.36	17.9	0.99	5.85
75	141.5	0.57	1.37	102.4	0.61	1.78	72.9	0.66	2.31	59.4	0.70	2.68	44.1	0.75	3.36	35.1	0.81	3.93	27.9	0.87	4.58	22.3	0.93	5.34	19.2	1.00	5.82
80	150.5	0.57	1.37	109.0	0.61	1.78	77.5	0.66	2.32	63.3	0.70	2.68	47.0	0.75	3.36	37.4	0.81	3.93	29.7	0.87	4.60	23.8	0.94	5.32	20.4	0.99	5.86
90	168.8	0.57	1.38	122.3	0.61	1.79	87.0	0.66	2.33	71.0	0.70	2.69	52.8	0.75	3.36	42.0	0.81	3.93	33.4	0.87	4.59	26.7	0.94	5.35	22.9	0.99	5.91
100	187.0	0.57	1.38	135.5	0.61	1.79	96.5	0.66	2.33	78.7	0.70	2.70	58.5	0.75	3.37	46.5	0.81	3.96	37.0	0.87	4.62	29.6	0.93	5.39	25.5	0.99	5.86
110	205.1	0.57	1.38	148.7	0.61	1.79	105.9	0.66	2.33	86.4	0.70	2.70	64.3	0.75	3.37	51.1	0.81	3.96	40.7	0.87	4.61	32.5	0.93	5.39	28.0	0.99	5.88
120	223.1	0.57	1.39	161.8	0.61	1.80	115.3	0.66	2.33	94.1	0.70	2.70	70.0	0.75	3.38	55.7	0.81	3.96	44.3	0.87	4.62	35.4	0.93	5.41	30.5	0.99	5.89
130	240.9	0.57	1.39	174.8	0.61	1.80	124.6	0.66	2.34	101.7	0.70	2.71	75.7	0.76	3.38	60.2	0.81	3.97	47.9	0.87	4.64	38.3	0.93	5.41	33.0	0.99	5.90
140	258.7	0.57	1.40	187.7	0.61	1.81	133.9	0.66	2.34	109.3	0.70	2.71	81.3	0.75	3.39	64.7	0.81	3.98	51.5	0.87	4.64	41.2	0.93	5.42	35.5	0.99	5.91
150	276.4	0.58	1.40	200.6	0.61	1.81	143.1	0.66	2.35	116.8	0.70	2.72	87.0	0.76	3.39	69.3	0.81	3.97	55.1	0.87	4.65	44.1	0.93	5.42	37.9	0.99	5.90
160	293.9	0.58	1.40	213.4	0.61	1.81	152.3	0.66	2.35	124.3	0.70	2.72	92.6	0.76	3.40	73.7	0.81	3.99	58.7	0.87	4.65	47.0	0.94	5.42	40.4	0.99	5.93
170	311.4	0.58	1.40	226.1	0.61	1.82	161.5	0.66	2.35	131.8	0.70	2.73	98.2	0.76	3.41	78.2	0.81	3.99	62.3	0.87	4.65	49.9	0.94	5.41	42.9	0.99	5.95
180	328.7	0.58	1.41	238.8	0.61	1.82	170.6	0.66	2.36	139.2	0.70	2.73	103.8	0.76	3.41	82.7	0.81	3.99	65.9	0.87	4.65	52.7	0.93	5.44	45.[illegible]	0.99	5.9[illegible]
190	346.0	0.58	1.41	251.4	0.61	1.83	179.7	0.67	2.36	146.6	0.70	2.74	109.4	0.76	3.41	87.1	0.81	4.00	69.4	0.87	4.67	55.6	0.94	5.43	47.5	0.99	5.97
200	363.1	0.58	1.42	263.9	0.61	1.83	188.7	0.67	2.37	155.0	0.70	2.74	114.9	0.76	3.42	91.6	0.81	4.00	73.0	0.87	4.66	58.4	0.94	5.45	50.3	0.99	5.96
220	398.3	0.58	1.42	289.6	0.62	1.83	207.1	0.67	2.37	169.6	0.71	2.75	126.1	0.76	3.43	100.6	0.81	4.00	80.1	0.87	4.68	64.2	0.94	5.45	55.2	0.99	5.99
240	433.2	0.58	1.42	315.0	0.62	1.84	225.4	0.67	2.37	185.0	0.70	2.75	137.5	0.76	3.43	109.5	0.81	4.01	87.3	0.87	4.68	69.9	0.94	5.46	60.2	0.99	5.99
260	467.9	0.58	1.43	340.4	0.62	1.84	243.7	0.67	2.38	198.9	0.70	2.76	148.5	0.76	3.44	118.5	0.81	4.01	94.4	0.87	4.69	75.6	0.94	5.47	65.1	0.99	5.99
280	502.5	0.58	1.43	365.6	0.62	1.84	261.8	0.67	2.38	211.7	0.70	2.76	159.7	0.76	3.44	127.4	0.81	4.02	101.5	0.87	4.70	81.4	0.94	5.48	70.1	0.99	6.01
300	536.7	0.58	1.43	390.7	0.62	1.85	279.9	0.67	2.38	228.[illegible]	0.71	2.77	170.7	0.76	3.45	136.2	0.81	4.03	108.6	0.87	4.70	87.0	0.94	5.48	75.9	0.99	6.01

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

(Sheet 11 of 14)

6- 691

R0071719

V_1 for RETARDANCE "D", Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 6.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	34.6	0.53	1.22	22.6	0.57	1.72	16.6	0.61	2.20	12.8	0.65	2.68	10.6	0.70	3.15	8.1	0.76	3.59	6.6	0.82	4.05	5.3	0.90	4.61	4.2	0.97	5.15
20	46.0	0.53	1.22	30.0	0.57	1.73	22.1	0.61	2.20	16.8	0.66	2.68	14.2	0.69	3.25	10.7	0.75	3.71	8.7	0.80	4.22	7.0	0.89	4.79	5.7	0.97	5.42
25	57.2	0.53	1.23	37.4	0.57	1.74	27.6	0.61	2.20	21.0	0.66	2.68	16.5	0.69	3.25	13.1	0.73	3.78	10.8	0.79	4.32	8.7	0.86	4.90	7.0	0.96	5.42
30	68.5	0.53	1.23	44.7	0.57	1.75	33.0	0.61	2.22	25.1	0.66	2.70	19.8	0.69	3.24	16.0	0.74	3.75	13.0	0.80	4.29	10.4	0.86	4.92	8.4	0.96	5.42
35	79.8	0.53	1.24	52.0	0.57	1.76	38.4	0.61	2.22	29.2	0.65	2.71	23.0	0.69	3.28	18.6	0.74	3.78	15.1	0.79	4.34	12.1	0.85	5.01	9.8	0.96	5.42
40	90.6	0.52	1.24	59.3	0.57	1.76	43.8	0.61	2.22	33.3	0.65	2.72	26.3	0.69	3.26	21.2	0.74	3.80	17.2	0.79	4.37	13.8	0.85	5.04	11.2	0.96	5.42
45	101.6	0.53	1.25	66.5	0.57	1.76	49.1	0.61	2.24	37.4	0.66	2.72	29.5	0.69	3.28	23.8	0.73	3.81	19.4	0.79	4.39	15.5	0.85	5.05	12.5	0.97	5.43
50	112.5	0.53	1.25	73.6	0.57	1.77	54.4	0.61	2.24	41.5	0.66	2.72	32.7	0.69	3.29	26.4	0.74	3.82	21.5	0.79	4.35	17.2	0.85	5.06	13.9	0.97	5.43
55	123.3	0.53	1.25	80.8	0.57	1.77	59.7	0.61	2.25	45.5	0.66	2.73	35.9	0.69	3.29	29.0	0.74	3.82	23.6	0.79	4.37	18.8	0.84	5.15	15.1	0.97	5.43
60	134.1	0.53	1.26	87.8	0.57	1.78	65.0	0.61	2.25	49.5	0.66	2.74	39.1	0.69	3.30	31.6	0.74	3.82	25.7	0.79	4.38	20.5	0.84	5.14	16.4	0.97	5.43
65	144.7	0.53	1.26	94.9	0.57	1.78	70.2	0.61	2.26	53.5	0.66	2.75	42.2	0.69	3.32	34.1	0.73	3.85	27.8	0.79	4.38	22.2	0.85	5.14	18.0	0.97	5.43
70	155.3	0.53	1.27	101.9	0.57	1.79	75.4	0.61	2.26	57.5	0.66	2.75	45.4	0.69	3.31	36.7	0.74	3.85	29.9	0.79	4.39	23.9	0.85	5.13	19.3	0.97	5.43
75	165.8	0.53	1.27	108.8	0.57	1.80	80.6	0.61	2.26	61.5	0.66	2.75	48.5	0.69	3.31	39.2	0.74	3.86	31.9	0.79	4.41	25.5	0.84	5.18	20.7	0.97	5.43
80	176.3	0.53	1.27	115.7	0.57	1.80	85.8	0.61	2.27	65.4	0.66	2.76	51.7	0.69	3.32	41.8	0.74	3.85	34.0	0.79	4.42	27.2	0.85	5.16	22.0	0.97	5.43
90	197.6	0.53	1.28	129.8	0.57	1.80	96.2	0.61	2.28	73.4	0.66	2.77	58.0	0.69	3.33	46.9	0.74	3.87	38.2	0.79	4.43	30.5	0.84	5.20	24.8	0.97	5.43
100	218.8	0.53	1.28	143.8	0.57	1.81	106.6	0.61	2.28	81.4	0.66	2.77	64.3	0.69	3.34	52.0	0.74	3.88	42.4	0.79	4.42	33.9	0.85	5.19	27.5	0.97	5.43
110	239.9	0.53	1.28	157.7	0.57	1.81	117.0	0.61	2.28	89.3	0.66	2.78	70.6	0.69	3.35	57.1	0.74	3.88	46.5	0.79	4.45	37.2	0.84	5.23	30.2	0.97	5.43
120	260.8	0.53	1.29	171.5	0.57	1.82	127.3	0.61	2.29	97.2	0.66	2.79	76.9	0.69	3.35	62.2	0.74	3.89	50.7	0.79	4.44	40.5	0.84	5.22	32.9	0.97	5.43
130	281.5	0.53	1.29	185.3	0.57	1.82	137.6	0.61	2.29	105.1	0.66	2.79	83.1	0.69	3.36	67.2	0.74	3.90	54.8	0.79	4.46	43.8	0.84	5.23	35.6	0.97	5.43
140	302.1	0.53	1.30	199.0	0.57	1.83	147.8	0.61	2.30	112.9	0.66	2.80	89.3	0.69	3.36	72.3	0.74	3.90	58.9	0.79	4.46	47.1	0.84	5.24	38.3	0.97	5.43
150	322.6	0.53	1.30	212.6	0.57	1.83	157.9	0.61	2.30	120.7	0.66	2.80	95.5	0.69	3.37	77.3	0.74	3.91	63.0	0.79	4.47	50.4	0.84	5.24	40.9	0.97	5.43
160	342.9	0.53	1.30	226.1	0.57	1.84	168.0	0.61	2.31	128.5	0.66	2.80	101.7	0.69	3.37	82.3	0.74	3.91	67.1	0.79	4.47	53.7	0.85	5.24	43.6	0.97	5.43
170	363.1	0.53	1.31	239.6	0.57	1.84	178.0	0.61	2.32	136.2	0.66	2.81	107.8	0.69	3.37	87.3	0.74	3.91	71.2	0.79	4.47	56.9	0.84	5.27	46.3	0.97	5.43
180	383.1	0.53	1.31	253.0	0.57	1.84	188.0	0.61	2.32	143.9	0.66	2.81	113.9	0.69	3.38	92.2	0.74	3.93	75.2	0.79	4.49	60.2	0.85	5.26	48.9	0.97	5.43
190	403.0	0.53	1.32	266.3	0.57	1.85	197.9	0.61	2.33	151.5	0.66	2.82	120.0	0.70	3.38	97.1	0.74	3.94	79.3	0.79	4.49	63.4	0.84	5.29	51.6	0.97	6.01
200	422.7	0.53	1.32	279.5	0.57	1.85	207.8	0.61	2.33	159.1	0.66	2.82	126.1	0.70	3.39	102.1	0.74	3.93	83.3	0.79	4.50	66.7	0.85	5.27	54.2	0.97	6.03
220	463.4	0.53	1.32	306.6	0.57	1.86	228.0	0.61	2.33	174.6	0.66	2.83	138.4	0.70	3.39	112.0	0.74	3.95	91.5	0.79	4.50	73.2	0.55	5.29	59.6	0.97	6.02
240	503.8	0.53	1.33	333.6	0.57	1.86	248.1	0.61	2.34	190.1	0.66	2.83	150.7	0.70	3.40	122.0	0.74	3.95	99.7	0.80	4.50	79.8	0.85	5.28	65.9	0.97	6.04
260	543.8	0.53	1.33	360.4	0.57	1.86	268.1	0.61	2.34	205.4	0.66	2.84	162.9	0.70	3.40	131.9	0.74	3.96	107.8	0.80	4.51	86.3	0.85	5.29	70.2	0.97	6.05
280	583.6	0.53	1.34	387.0	0.57	1.87	287.9	0.61	2.35	220.7	0.66	2.85	175.1	0.70	3.41	141.8	0.74	3.96	115.9	0.80	4.51	92.8	0.85	5.30	75.5	0.97	6.05
300	623.2	0.53	1.34	413.5	0.58	1.87	307.7	0.61	2.36	235.9	0.66	2.85	187.2	0.70	3.41	151.6	0.74	3.97	123.9	0.80	4.51	99.3	0.85	5.30	80.8	0.97	6.06

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

6- 692

R0071720

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 8.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	37.0	0.47	1.26	26.6	0.51	1.65	18.7	0.54	2.19	15.3	0.57	2.54	11.7	0.61	3.08	9.4	0.65	3.61	7.9	0.70	3.99	6.4	0.74	4.62	5.3	0.81	5.18
20	49.2	0.47	1.26	35.3	0.50	1.66	24.9	0.54	2.19	20.4	0.57	2.54	15.6	0.61	3.08	12.5	0.65	3.65	10.4	0.68	4.17	8.5	0.74	4.70	7.1	0.81	5.16
25	61.2	0.47	1.27	44.0	0.50	1.67	31.0	0.54	2.21	25.4	0.57	2.56	19.4	0.61	3.12	15.6	0.65	3.67	13.0	0.68	4.17	10.6	0.73	4.75	8.9	0.79	5.32
30	73.2	0.47	1.28	52.6	0.50	1.67	37.2	0.54	2.19	30.4	0.57	2.57	23.3	0.61	3.10	18.7	0.65	3.67	15.6	0.68	4.17	12.7	0.73	4.77	10.5	0.79	5.41
35	85.1	0.47	1.28	61.2	0.50	1.68	43.2	0.54	2.21	35.3	0.57	2.59	27.1	0.61	3.12	21.7	0.64	3.72	18.1	0.68	4.23	14.8	0.73	4.79	12.2	0.77	5.49
40	96.9	0.47	1.28	69.7	0.50	1.68	49.3	0.54	2.21	40.3	0.57	2.59	30.9	0.61	3.13	24.8	0.64	3.71	20.7	0.68	4.20	16.9	0.73	4.79	13.9	0.77	5.53
45	108.6	0.47	1.29	78.2	0.51	1.68	55.3	0.54	2.22	45.2	0.57	2.60	34.6	0.61	3.16	27.8	0.64	3.73	23.2	0.68	4.24	19.0	0.73	4.78	15.7	0.78	5.45
50	120.2	0.48	1.29	86.5	0.50	1.69	61.2	0.54	2.23	50.0	0.57	2.62	38.4	0.61	3.15	30.9	0.65	3.71	25.8	0.68	4.21	21.0	0.73	4.84	17.4	0.79	5.49
55	131.8	0.48	1.30	94.9	0.51	1.70	67.1	0.54	2.24	54.9	0.57	2.62	42.1	0.61	3.17	33.9	0.65	3.73	28.3	0.68	4.23	23.1	0.73	4.83	19.1	0.79	5.50
60	143.2	0.48	1.30	103.1	0.51	1.70	73.0	0.54	2.24	59.7	0.57	2.62	45.9	0.61	3.16	36.9	0.65	3.73	30.8	0.68	4.24	25.1	0.73	4.87	20.8	0.79	5.51
65	154.6	0.48	1.30	111.4	0.51	1.71	78.9	0.54	2.24	64.5	0.57	2.63	49.6	0.61	3.16	39.9	0.65	3.74	33.3	0.68	4.25	27.2	0.73	4.85	22.5	0.79	5.52
70	165.9	0.48	1.31	119.5	0.51	1.71	84.7	0.54	2.25	69.3	0.57	2.63	53.2	0.61	3.19	42.8	0.64	3.76	35.8	0.68	4.26	29.2	0.73	4.88	24.1	0.77	5.59
75	177.1	0.48	1.31	127.6	0.51	1.72	90.5	0.54	2.25	74.1	0.57	2.63	56.9	0.61	3.19	45.8	0.65	3.76	38.2	0.68	4.29	31.2	0.73	4.90	25.8	0.77	5.59
80	189.2	0.48	1.32	135.6	0.51	1.72	96.2	0.54	2.26	78.8	0.57	2.64	60.5	0.61	3.20	48.7	0.64	3.78	40.7	0.68	4.29	33.3	0.73	4.87	27.5	0.77	5.58
90	210.9	0.48	1.32	152.1	0.51	1.73	108.0	0.55	2.26	88.4	0.57	2.65	67.9	0.61	3.21	54.7	0.65	3.78	45.7	0.68	4.29	37.4	0.73	4.88	30.9	0.77	5.59
100	233.5	0.48	1.32	168.4	0.51	1.73	119.6	0.55	2.27	98.0	0.57	2.65	75.3	0.61	3.21	60.7	0.65	3.78	50.6	0.68	4.32	41.4	0.73	4.92	34.2	0.77	5.64
110	255.9	0.48	1.33	184.6	0.51	1.74	131.2	0.55	2.28	107.5	0.57	2.66	82.6	0.61	3.22	66.6	0.65	3.79	55.6	0.68	4.32	45.5	0.73	4.91	37.6	0.77	5.63
120	278.1	0.48	1.33	200.7	0.51	1.74	142.7	0.55	2.28	116.9	0.57	2.67	89.9	0.61	3.23	72.5	0.65	3.79	60.5	0.68	4.33	49.5	0.73	4.93	40.9	0.77	5.64
130	300.2	0.48	1.34	216.6	0.51	1.75	154.1	0.55	2.29	126.4	0.57	2.67	97.1	0.61	3.24	78.3	0.65	3.81	65.4	0.68	4.34	53.6	0.73	4.92	44.3	0.77	5.64
140	322.1	0.48	1.34	232.5	0.51	1.76	165.5	0.55	2.29	135.7	0.57	2.67	104.4	0.62	3.23	84.2	0.65	3.81	70.3	0.69	4.34	57.6	0.73	4.93	47.6	0.77	5.66
150	343.9	0.48	1.34	248.3	0.51	1.76	176.8	0.55	2.30	145.0	0.57	2.68	111.5	0.61	3.25	90.0	0.65	3.82	75.2	0.68	4.35	61.6	0.73	4.94	50.9	0.77	5.67
160	365.5	0.48	1.35	264.0	0.51	1.76	188.1	0.55	2.30	154.3	0.57	2.68	118.7	0.62	3.25	95.8	0.65	3.82	80.0	0.68	4.36	65.6	0.73	4.95	54.2	0.77	5.68
170	386.9	0.48	1.35	279.6	0.51	1.77	199.3	0.55	2.31	163.5	0.57	2.69	125.8	0.62	3.26	101.6	0.65	3.82	84.8	0.68	4.37	69.5	0.73	4.97	57.5	0.77	5.69
180	408.2	0.48	1.36	295.1	0.51	1.77	210.4	0.55	2.31	172.7	0.57	2.69	132.8	0.62	3.27	107.3	0.65	3.84	89.7	0.68	4.36	73.5	0.73	4.96	60.8	0.77	5.69
190	429.3	0.48	1.36	310.5	0.51	1.78	221.4	0.55	2.32	181.8	0.57	2.70	139.9	0.62	3.27	113.0	0.65	3.84	94.4	0.68	4.38	77.4	0.73	4.98	64.0	0.77	5.71
200	450.2	0.48	1.36	325.7	0.51	1.78	232.4	0.55	2.32	190.8	0.57	2.71	146.9	0.62	3.28	118.7	0.65	3.85	99.2	0.68	4.39	81.4	0.73	4.97	67.3	0.77	5.71
220	493.4	0.48	1.37	357.1	0.51	1.79	254.9	0.55	2.33	209.4	0.58	2.71	161.1	0.62	3.29	130.3	0.65	3.85	108.9	0.68	4.39	89.3	0.73	4.99	73.9	0.77	5.72
240	536.2	0.48	1.37	388.3	0.51	1.79	277.3	0.55	2.34	227.8	0.58	2.71	175.4	0.62	3.29	141.8	0.65	3.86	118.6	0.68	4.40	97.3	0.74	4.99	80.5	0.77	5.72
260	578.8	0.48	1.38	419.3	0.51	1.80	299.5	0.55	2.34	246.2	0.58	2.72	189.5	0.62	3.30	153.3	0.65	3.87	128.2	0.68	4.40	105.2	0.74	5.00	87.1	0.77	5.74
280	621.1	0.48	1.38	450.1	0.51	1.80	321.6	0.55	2.35	264.4	0.58	2.72	203.6	0.62	3.31	164.8	0.65	3.87	137.8	0.68	4.41	113.1	0.74	5.00	93.5	0.77	5.76
300	663.1	0.48	1.39	480.7	0.51	1.81	343.6	0.55	2.35	282.6	0.58	2.73	217.6	0.62	3.31	176.1	0.65	3.88	147.4	0.69	4.41	120.9	0.74	5.02	100.1	0.78	5.75

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

6-693

R0071721

V_1 for RETARDANCE "D". Top Width (T), Depth (D) and V_2 for RETARDANCE "C".

Grade 10.0 Percent

Q cfs	V_1 = 2.0			V_1 = 2.5			V_1 = 3.0			V_1 = 3.5			V_1 = 4.0			V_1 = 4.5			V_1 = 5.0			V_1 = 5.5			V_1 = 6.0		
	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2	T	D	V_2
15	45.2	0.43	1.14	32.5	0.45	1.50	22.9	0.49	1.98	16.6	0.52	2.56	13.4	0.55	2.99	10.7	0.58	3.55	9.0	0.61	3.99	7.4	0.65	4.57	6.2	0.70	5.08
20	60.1	0.43	1.14	43.2	0.45	1.50	30.4	0.49	2.00	22.1	0.52	2.56	17.8	0.55	3.02	14.3	0.59	3.52	12.0	0.61	4.00	9.9	0.65	4.55	8.3	0.70	5.06
25	74.8	0.43	1.15	53.8	0.45	1.51	37.9	0.49	2.00	27.5	0.52	2.59	22.3	0.55	2.99	17.8	0.58	3.56	14.9	0.61	4.08	12.3	0.65	4.63	10.3	0.69	5.16
30	89.3	0.43	1.15	64.2	0.45	1.52	45.3	0.49	2.01	33.0	0.52	2.58	26.6	0.55	3.03	21.3	0.58	3.58	17.9	0.61	4.05	14.7	0.64	4.68	12.4	0.70	5.13
35	103.7	0.43	1.16	74.6	0.45	1.53	52.6	0.48	2.03	38.3	0.52	2.60	31.0	0.55	3.02	24.8	0.58	3.59	20.8	0.61	4.09	17.2	0.65	4.63	14.4	0.69	5.19
40	118.0	0.43	1.16	85.0	0.46	1.53	59.9	0.48	2.04	43.7	0.52	2.60	35.3	0.55	3.04	28.3	0.58	3.59	23.8	0.61	4.06	19.6	0.65	4.66	16.4	0.69	5.26
45	132.2	0.43	1.17	95.2	0.45	1.53	67.2	0.49	2.04	49.0	0.52	2.61	39.6	0.55	3.05	31.7	0.58	3.62	26.7	0.61	4.08	22.0	0.65	4.68	18.4	0.69	5.22
50	146.3	0.43	1.17	105.3	0.45	1.54	74.4	0.49	2.04	54.3	0.52	2.61	43.9	0.55	3.05	35.2	0.58	3.61	29.6	0.61	4.09	24.4	0.65	4.68	20.4	0.69	5.25
55	160.2	0.43	1.17	115.4	0.46	1.55	81.5	0.49	2.06	59.5	0.52	2.61	48.2	0.55	3.05	38.6	0.58	3.62	32.4	0.61	4.13	26.7	0.64	4.74	22.4	0.69	5.29
60	174.0	0.43	1.18	125.3	0.46	1.55	88.6	0.49	2.06	64.7	0.52	2.61	52.4	0.55	3.07	42.0	0.58	3.63	35.3	0.61	4.12	29.1	0.65	4.73	24.4	0.69	5.30
65	187.6	0.43	1.18	135.2	0.46	1.56	95.6	0.49	2.07	69.9	0.52	2.64	56.6	0.55	3.08	45.4	0.58	3.64	38.2	0.61	4.12	31.5	0.65	4.72	26.4	0.69	5.31
70	201.2	0.43	1.19	145.0	0.46	1.57	102.6	0.49	2.08	75.1	0.52	2.64	60.8	0.55	3.08	48.7	0.58	3.66	41.0	0.61	4.14	33.8	0.65	4.75	28.4	0.69	5.29
75	214.6	0.43	1.19	154.7	0.46	1.57	109.6	0.49	2.08	80.2	0.52	2.65	65.0	0.55	3.08	52.1	0.58	3.66	43.8	0.61	4.15	36.2	0.65	4.74	30.3	0.69	5.31
80	227.9	0.43	1.20	164.3	0.46	1.58	116.4	0.49	2.09	85.3	0.52	2.65	69.1	0.55	3.09	55.4	0.58	3.67	46.6	0.61	4.16	38.5	0.65	4.76	32.3	0.69	5.32
90	255.2	0.43	1.20	184.1	0.46	1.58	130.5	0.49	2.10	95.6	0.52	2.67	77.5	0.55	3.11	62.1	0.58	3.69	52.3	0.61	4.17	43.2	0.65	4.78	36.3	0.69	5.33
100	282.4	0.43	1.20	203.7	0.46	1.59	144.5	0.49	2.10	105.9	0.52	2.67	85.9	0.56	3.11	68.8	0.58	3.70	58.0	0.61	4.18	47.9	0.65	4.78	40.2	0.69	5.34
110	309.2	0.43	1.21	223.2	0.46	1.60	158.4	0.49	2.11	116.2	0.52	2.68	94.3	0.56	3.11	75.5	0.58	3.71	63.7	0.61	4.18	52.6	0.65	4.79	44.2	0.69	5.35
120	335.9	0.43	1.21	242.4	0.46	1.60	172.2	0.49	2.12	126.4	0.52	2.68	102.5	0.56	3.12	82.2	0.58	3.71	69.3	0.61	4.19	57.3	0.65	4.79	48.1	0.69	5.36
130	362.3	0.43	1.22	261.6	0.46	1.61	185.9	0.49	2.12	136.5	0.52	2.69	110.8	0.56	3.13	88.8	0.58	3.72	74.9	0.61	4.20	61.9	0.65	4.81	52.0	0.69	5.37
140	388.4	0.44	1.22	280.5	0.46	1.61	199.5	0.49	2.13	146.5	0.52	2.70	119.0	0.56	3.13	95.4	0.58	3.73	80.5	0.61	4.20	66.5	0.65	4.82	55.9	0.69	5.38
150	414.4	0.44	1.23	299.3	0.46	1.62	213.0	0.49	2.13	156.5	0.52	2.71	127.1	0.56	3.14	101.9	0.58	3.74	86.0	0.61	4.22	71.1	0.65	4.83	59.7	0.69	5.41
160	440.1	0.44	1.23	318.1	0.46	1.62	226.5	0.49	2.14	166.4	0.53	2.71	135.2	0.56	3.15	108.4	0.58	3.75	91.6	0.62	4.21	75.7	0.65	4.83	63.6	0.69	5.41
170	465.5	0.44	1.24	336.7	0.46	1.63	239.8	0.49	2.14	176.1	0.53	2.72	143.1	0.56	3.15	114.9	0.58	3.76	97.1	0.62	4.22	80.3	0.65	4.83	67.4	0.69	5.42
180	490.8	0.44	1.24	355.1	0.46	1.63	253.1	0.49	2.15	186.1	0.53	2.73	151.1	0.56	3.16	121.3	0.58	3.77	102.5	0.62	4.24	85.9	0.65	4.84	71.3	0.69	5.43
190	515.7	0.44	1.25	373.5	0.46	1.64	266.3	0.49	2.15	195.9	0.53	2.73	159.1	0.56	3.17	127.7	0.58	3.78	108.0	0.62	4.24	89.4	0.65	4.85	75.1	0.69	5.43
200	540.5	0.44	1.25	391.6	0.46	1.64	279.4	0.49	2.16	205.6	0.53	2.74	167.2	0.56	3.17	134.1	0.58	3.79	113.4	0.62	4.25	93.9	0.65	4.85	78.9	0.69	5.44
220	592.0	0.44	1.26	429.2	0.46	1.65	306.3	0.49	2.17	225.4	0.53	2.75	183.5	0.56	3.18	147.1	0.58	3.80	124.4	0.62	4.26	103.1	0.65	4.85	86.6	0.69	5.45
240	643.0	0.44	1.26	466.4	0.46	1.65	333.1	0.49	2.17	245.2	0.53	2.75	199.6	0.56	3.19	160.0	0.58	3.81	135.4	0.62	4.27	112.2	0.65	4.87	94.3	0.69	5.45
260	693.6	0.44	1.27	503.4	0.46	1.66	359.6	0.49	2.18	264.8	0.53	2.76	215.6	0.56	3.19	172.9	0.58	3.82	146.4	0.62	4.27	121.3	0.65	4.87	101.9	0.69	5.47
280	743.7	0.44	1.27	540.0	0.46	1.66	386.0	0.49	2.18	284.4	0.53	2.77	231.6	0.56	3.20	185.8	0.59	3.82	157.3	0.62	4.28	131.4	0.65	4.88	109.6	0.69	5.47
300	793.4	0.44	1.28	576.4	0.46	1.67	412.3	0.49	2.19	303.8	0.53	2.77	247.5	0.56	3.21	198.6	0.59	3.83	168.1	0.62	4.29	139.4	0.65	4.89	117.2	0.69	5.48

Exhibit 7-5 Parabolic waterway design
(Retardance "D" and "C")

(Sheet 14 of 14)

R0071722

APPENDIX 6-5

Flow Capacity Charts for Subsurface Drains

Published courtesy of Advanced Drainage Systems, Inc. and U.S.D.A. Soil Conservation Service

R0071723

Technical Notes

Tech Note No. 2.109
Re: Flow Capacity - Subsurface Drains

Date: October 21, 1983
By: R.C. Reeve
Rev. - J.B. Goddard

FLOW CAPACITY--SUBSURFACE DRAINS

Although flow capacity and "n" values have been distributed in various forms in the past, this Technical Note is published to bring together in a single report the current Soil Conservation Service and ADS test information on the subject.

Regarding Manning's "n" values for design purposes, the Soil Conservation Service issued an advisory on August 31, 1978 giving "n" values for subsurface drains. A copy of this advisory (ENG-29) is included herein. Tests on larger diameters; 18" and 24" which were not available at that time, indicate that an "n" of 0.020 is reasonable for design purposes.

Attached are several tables (Nos. 1-15 and 16) from the SCS. Tables Nos. 1-15 give flow capacities in cubic feet per second (CFS) for subsurface drains flowing full at zero back pressure for sizes ranging from 3 to 48 inches (I.D.). Table 16 gives the number of acres drained for various discharge capacities for drainage ccoefficients ranging from 1/4 inch through 4 inches per day (24 hours).

Also attached are flow charts (Figure 1-7) showing flow capacities versus slope for Mannings "n" values ranging from "n"=0.012 through "n"=0.018. Flow velocities in feet per second are also shown, these charts cover the pipe sizes from 4 through 18 inches.

ADS Recommended Manning's "n" for Design

Diameter	Manning's "n" Value
3" - 6"	0.015
8"	0.016
10"	0.017
12" - 15"	0.018
18" - 24"	0.020

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, P.O. Box 2890
Washington, D. C. 20013

August 31, 1978

Advisory ENG-29

FROM: Neil F. Bogner, Director, Engineering Division, SCS

RE: Hydraulic Roughness Coefficients for Subsurface Drain and Underground Outlet Designs

A number of questions have been brought to our attention involving the selection of hydraulic roughness coefficients ("n" values) used in Manning's formula when calculating flow for corrugated plastic tubing and drain tile systems. Existing literature has been reviewed and hydraulic tests are being initiated by research groups in an effort to obtain more precise information for selection of the appropriate coefficient.

Until adequate test data becomes available, we suggest the following values for use with normal installations:

Materials	Diameter	Manning's "n" Value
Clay or Concrete Drain Tile	All Sizes	0.012 to 0.014
Corrugated Plastic Tubing	3 to 8 Inch	0.015 to 0.016
Corrugated Plastic Tubing	10 to 15 Inch	0.017 to 0.018

When more reliable information becomes available, we will revise Section 16 of the National Engineering Handbook to indicate the new suggested values.

Acting

NEIL F. BOGNER
Director
Engineering Division

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R0071725

TABLE 1

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.012

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}\ A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT CAPACITY - CUBIC FEET PER SECOND												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
3	0.957	0.009	0.013	0.021	0.030	0.04	0.06	0.09	0.13	0.21	0.30	0.42	0.67	0.95
4	2.061	0.020	0.029	0.046	0.065	0.09	0.14	0.20	0.29	0.46	0.65	0.92	1.45	2.06
5	3.738	0.037	0.052	0.083	0.118	0.16	0.26	0.37	0.52	0.83	1.18	1.67	2.64	3.73
6	6.078	0.060	0.085	0.135	0.192	0.27	0.42	0.60	0.85	1.35	1.92	2.71	4.29	6.07
8	13.091	0.130	0.185	0.292	0.413	0.58	0.92	1.30	1.85	2.92	4.13	5.85	9.25	13.09
10	23.735	0.237	0.335	0.530	0.75	1.06	1.67	2.37	3.35	5.30	7.50	10.61	16.78	23.73
12	38.597	0.385	0.545	0.863	1.22	1.72	2.72	3.85	5.45	8.63	12.20	17.26	27.29	38.59
14	58.221	0.582	0.823	1.301	1.84	2.60	4.11	5.82	8.23	13.01	18.41	26.03	41.16	58.22
15	69.901	0.699	0.989	1.564	2.21	3.12	4.94	6.99	9.89	15.64	22.13	31.29	49.48	69.99
16	83.123	0.831	1.175	1.858	2.62	3.71	5.87	8.31	11.75	18.58	26.28	37.17	58.77	83.12
18	113.797	1.13	1.60	2.54	3.59	5.08	8.04	11.37	16.09	25.44	35.9	50.8	80.4	113.7
20	150.713	1.50	2.13	3.37	4.76	6.74	10.65	15.07	21.31	33.70	47.6	67.4	106.5	150.7
21	171.655	1.71	2.42	3.83	5.42	7.67	12.13	17.16	24.27	38.38	54.2	76.7	121.3	171.6
24	245.076	2.45	3.46	5.48	7.75	10.96	17.32	24.50	34.65	54.80	77.5	109.6	173.2	245.0
27	335.512	3.35	4.74	7.50	10.60	15.00	23.72	33.55	47.44	75.02	106.0	150.0	237.2	335.5
30	444.153	4.44	6.29	9.93	14.05	19.87	31.42	44.4	62.8	99.3	140.5	198.	314.	444.
36	722.567	7.22	10.21	16.15	22.84	32.31	51.09	72.2	102.1	161.5	228.4	323.	510.	722.
42	1089.941	10.89	15.41	24.37	34.46	48.74	77.07	108.9	154.1	243.7	344.6	487.	770.	1089.
48	1556.139	15.56	22.00	34.79	49.20	69.59	110.03	155.6	220.0	347.9	492.0	695.	1100.	1556.

R0071726

TABLE 2

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.013

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}\ A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.481	0.008	0.012	0.019	0.027	0.03	0.06	0.08	0.12	0.19	0.27	0.39	0.62	0.88
4	1.903	0.019	0.026	0.042	0.060	0.08	0.13	0.19	0.26	0.42	0.60	0.85	1.34	1.90
5	3.450	0.034	0.048	0.077	0.109	0.15	0.24	0.34	0.48	0.77	1.09	1.54	2.43	3.45
6	5.611	0.056	0.079	0.125	0.177	0.25	0.39	0.56	0.79	1.25	1.77	2.50	3.96	5.61
8	12.084	0.120	0.170	0.270	0.382	0.54	0.85	1.20	1.70	2.70	3.82	5.40	8.54	12.08
10	21.910	0.219	0.309	0.489	0.69	0.97	1.54	2.19	3.09	4.89	6.92	9.79	15.49	21.91
12	35.628	0.356	0.503	0.796	1.12	1.59	2.51	3.56	5.03	7.96	11.26	15.93	25.19	35.62
14	53.742	0.537	0.760	1.201	1.69	2.40	3.80	5.37	7.60	12.01	16.99	24.03	38.00	53.74
15	64.598	0.645	0.913	1.444	2.04	2.88	4.56	6.45	9.13	14.44	20.42	28.88	45.67	64.59
16	76.729	0.767	1.085	1.715	2.42	3.43	5.42	7.67	10.85	17.15	24.26	34.31	54.25	76.72
18	105.043	1.05	1.48	2.34	3.32	4.69	7.42	10.50	14.85	23.48	33.2	46.9	74.2	105.0
20	139.120	1.39	1.96	3.11	4.39	6.22	9.83	13.91	19.67	31.10	43.9	62.2	98.3	139.1
21	158.450	1.58	2.24	3.54	5.01	7.08	11.20	15.84	22.40	35.43	50.1	70.8	112.0	158.4
24	226.224	2.26	3.19	5.05	7.15	10.11	15.99	22.62	31.99	50.58	71.5	101.1	159.9	226.2
27	309.701	3.09	4.37	6.92	9.79	13.85	21.89	30.97	43.79	69.25	97.9	138.5	218.9	309.7
30	410.172	4.10	5.80	9.17	12.97	18.34	29.00	41.0	58.0	91.7	129.7	183.	290.	410.
36	666.965	6.66	9.43	14.91	21.09	29.82	47.16	66.6	94.3	149.1	210.9	298.	471.	666.
42	1006.099	10.06	14.22	22.49	31.81	44.99	71.14	100.6	142.2	224.9	318.1	449.	711.	1006.
48	1436.436	14.36	20.31	32.11	45.42	64.23	101.57	143.6	203.1	321.1	454.2	642.	1015.	1436.

R0071727

TABLE 3

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.014

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}\ A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.820	0.008	0.011	0.018	0.025	0.03[1]	0.05	0.08	0.11	0.18	0.25	0.36	0.58	0.82
4	1.767	0.017	0.024	0.039	0.055	0.07	0.12	0.17	0.24	0.39	0.55	0.79	1.24	1.76
5	3.204	0.032	0.045	0.071	0.101	0.14	0.22	0.32	0.45	0.71	1.01	1.43	2.26	3.20
6	5.210	0.052	0.073	0.116	0.164	0.23	0.36	0.52	0.73	1.16	1.64	2.33	3.68	5.21
8	11.221	0.112	0.158	0.250	0.354	0.50	0.79	1.12	1.58	2.50	3.54	5.01	7.93	11.22
10	20.345	0.203	0.287	0.454	0.64	0.90	1.43	2.03	2.87	4.54	6.43	9.09	14.38	20.34
12	33.083	0.330	0.467	0.739	1.04	1.47	2.33	3.30	4.67	7.39	10.46	14.79	23.39	33.08
14	49.903	0.499	0.705	1.115	1.57	2.23	3.52	4.99	7.05	11.15	15.78	22.31	35.28	49.90
15	59.981	0.599	0.848	1.341	1.89	2.68	4.24	5.99	8.48	13.41	18.96	26.82	42.41	59.98
16	71.248	0.712	1.007	1.593	2.25	3.18	5.03	7.12	10.07	15.93	22.53	31.86	50.38	71.24
18	97.540	0.97	1.37	2.18	3.08	4.36	6.89	9.75	13.79	21.81	30.8	43.6	68.9	97.5
20	129.182	1.29	1.82	2.88	4.08	5.77	9.13	12.91	18.26	28.89	40.8	57.7	91.3	129.1
21	147.132	1.47	2.08	3.28	4.65	6.57	10.40	14.71	20.80	32.89	46.5	65.7	104.0	147.1
24	210.065	2.10	2.97	4.69	6.64	9.39	14.85	21.00	29.70	46.97	66.4	93.9	148.5	210.0
27	287.582	2.87	4.06	6.43	9.09	12.86	20.33	28.75	40.67	64.30	90.9	128.6	203.3	287.5
30	380.874	3.80	5.38	8.51	12.04	17.03	26.93	38.0	53.8	85.1	120.4	170.	269.	380.
36	619.343	6.19	8.75	13.84	19.56	27.69	43.79	61.9	87.5	138.4	195.8	276.	437.	619.
42	934.235	9.34	13.21	20.89	29.54	41.78	66.06	93.4	132.1	208.9	295.4	417.	660.	934.
48	1333.833	13.33	18.86	29.82	42.17	59.65	94.31	133.3	188.6	298.2	421.7	596.	943.	1333.

R0071728

TABLE 4

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.015

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}\ A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.765	0.007	0.010	0.017	0.024	0.03	0.05	0.07	0.10	0.17	0.24	0.34	0.54	0.76
4	1.649	0.016	0.023	0.036	0.052	0.07	0.11	0.16	0.23	0.36	0.52	0.73	1.16	1.64
5	2.990	0.029	0.042	0.066	0.094	0.13	0.21	0.29	0.42	0.66	0.94	1.33	2.11	2.99
6	4.862	0.048	0.068	0.108	0.153	0.21	0.34	0.48	0.68	1.08	1.53	2.17	3.43	4.86
8	10.472	0.104	0.148	0.234	0.331	0.46	0.74	1.04	1.48	2.34	3.31	4.68	7.40	10.47
10	19.088	0.189	0.268	0.424	0.60	0.84	1.34	1.89	2.68	4.24	6.00	8.49	13.42	18.98
12	30.877	0.308	0.436	0.690	0.97	1.38	2.18	3.08	4.36	6.90	9.76	13.80	21.83	30.87
14	46.576	0.465	0.658	1.041	1.47	2.08	3.29	4.65	6.58	10.41	14.72	20.82	32.93	46.57
15	55.985	0.559	0.791	1.251	1.77	2.50	3.95	5.59	7.91	12.51	17.70	25.03	39.58	55.98
16	66.498	0.664	0.940	1.486	2.10	2.97	4.70	6.64	9.40	14.86	21.02	29.73	47.02	66.49
18	91.037	0.91	1.28	2.03	2.87	4.07	6.43	9.10	12.87	20.35	28.7	40.7	64.3	91.0
20	120.570	1.20	1.70	2.69	3.81	5.39	8.52	12.05	17.05	26.96	38.1	53.9	85.2	120.5
21	137.324	1.37	1.94	3.07	4.34	6.14	9.71	13.73	19.42	30.70	43.4	61.4	97.1	137.3
24	196.061	1.96	2.77	4.38	6.20	8.76	13.86	19.60	27.72	43.84	62.0	87.6	138.6	196.0
27	268.409	2.68	3.79	6.00	8.48	12.00	18.97	26.84	37.95	60.01	84.8	120.0	189.7	268.4
30	355.482	3.55	5.02	7.94	11.24	15.89	25.13	35.5	50.2	79.4	112.4	158.	251.	355.
36	578.054	5.78	8.17	12.92	18.27	25.85	40.87	57.8	81.7	129.2	182.7	258.	408.	578.
42	871.953	8.71	12.33	19.49	27.57	38.99	61.65	87.1	123.3	194.9	275.7	389.	616.	871.
48	1244.911	12.44	17.60	27.83	39.36	55.67	88.02	124.4	176.0	278.3	393.6	556.	880.	1244.

R0071729

TABLE 5

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.016

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3} A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.717	0.007	0.010	0.016	0.022	0.03	0.05	0.07	0.10	0.16	0.22	0.32	0.50	0.71
4	1.546	0.015	0.021	0.034	0.048	0.06	0.10	0.15	0.21	0.34	0.48	0.69	1.09	1.54
5	2.903	0.028	0.039	0.062	0.088	0.12	0.19	0.28	0.39	0.62	0.88	1.25	1.98	2.80
6	4.559	0.045	0.064	0.101	0.144	0.20	0.32	0.45	0.64	1.01	1.44	2.03	3.22	4.55
8	9.818	0.098	0.138	0.219	0.310	0.43	0.69	0.98	1.38	2.19	3.10	4.39	6.94	9.81
10	17.801	0.178	0.251	0.398	0.56	0.79	1.25	1.78	2.51	3.98	5.62	7.96	12.58	17.80
12	28.947	0.289	0.409	0.647	0.91	1.29	2.04	2.89	4.09	6.47	9.15	12.94	20.46	28.94
14	43.665	0.436	0.617	0.976	1.38	1.95	3.08	4.36	6.17	9.76	13.80	19.52	30.87	43.66
15	52.483	0.524	0.742	1.173	1.65	2.34	3.71	5.24	7.42	11.73	16.59	23.47	37.11	52.48
16	62.342	0.623	0.881	1.394	1.97	2.78	4.40	6.23	8.81	13.94	19.71	27.88	44.08	62.34
18	85.347	0.85	1.20	1.90	2.69	3.81	6.03	8.53	12.07	19.08	26.9	38.1	60.3	85.3
20	113.035	1.13	1.59	2.52	3.57	5.05	7.99	11.30	15.98	25.27	35.7	50.5	79.9	113.0
21	129.741	1.30	1.82	2.87	4.07	5.75	9.10	12.87	18.20	28.78	40.7	57.5	91.0	128.7
24	183.807	1.83	2.59	4.11	5.81	8.22	12.99	18.38	25.99	41.10	58.1	82.2	129.9	183.8
27	251.634	2.51	3.55	5.62	7.95	11.25	17.79	25.16	35.58	56.26	79.5	112.5	177.9	251.6
30	333.265	3.33	4.71	7.45	10.53	14.90	23.56	33.3	47.1	74.5	105.3	149.	235.	333.
36	541.925	5.41	7.66	12.11	17.13	24.23	38.31	54.1	76.6	121.1	171.3	242.	383.	541.
42	817.456	8.17	11.56	18.27	25.85	36.55	57.80	81.7	115.6	182.7	258.5	365.	578.	817.
48	1167.104	11.67	16.50	26.09	36.90	52.19	82.52	116.7	165.0	260.9	369.0	521.	825.	1167.

R0071730

TABLE 6

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.017

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}\ A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.675	0.006	0.009	0.015	0.021	0.03	0.04	0.06	0.09	0.15	0.21	0.30	0.47	0.67
4	1.455	0.014	0.020	0.032	0.046	0.06	0.10	0.14	0.20	0.32	0.46	0.65	1.02	1.45
5	2.638	0.026	0.037	0.059	0.083	0.11	0.18	0.26	0.37	0.59	0.83	1.18	1.86	2.63
6	4.290	0.042	0.060	0.095	0.135	0.19	0.30	0.42	0.60	0.95	1.35	1.91	3.03	4.29
8	9.240	0.092	0.130	0.206	0.292	0.41	0.65	0.92	1.30	2.06	2.92	4.13	6.53	9.24
10	16.754	0.167	0.236	0.374	0.52	0.74	1.18	1.67	2.36	3.74	5.29	7.49	11.84	16.75
12	27.245	0.272	0.385	0.609	0.86	1.21	1.92	2.72	3.85	6.09	8.61	12.18	19.26	27.24
14	41.097	0.410	0.581	0.918	1.29	1.83	2.90	4.10	5.81	9.18	12.99	18.37	29.06	41.09
15	49.398	0.493	0.696	1.104	1.56	2.20	3.49	4.93	6.98	11.04	15.62	22.09	34.93	49.39
16	58.675	0.586	0.829	1.312	1.85	2.62	4.14	5.86	8.29	13.12	18.55	26.24	41.48	58.67
18	80.327	0.80	1.13	1.79	2.54	3.59	5.68	8.03	11.36	17.96	25.4	35.9	56.8	80.3
20	106.385	1.06	1.50	2.37	3.36	4.75	7.52	10.63	15.04	23.78	33.6	47.5	75.2	106.3
21	121.168	1.21	1.71	2.70	3.83	5.41	8.56	12.11	17.13	27.09	38.3	54.1	85.6	121.1
24	172.995	1.72	2.44	3.86	5.47	7.73	12.23	17.29	24.46	33.68	54.7	77.3	122.3	172.9
27	236.832	2.36	3.34	5.29	7.48	10.59	16.74	23.68	33.49	52.95	74.8	105.9	167.4	236.8
30	313.661	3.13	4.43	7.01	9.91	14.02	22.17	31.3	44.3	70.1	99.1	140.	221.	313.
36	510.047	5.10	7.21	11.40	16.12	22.81	36.06	51.0	72.1	114.0	161.2	228.	360.	510.
42	769.370	7.69	10.98	17.20	24.32	34.40	54.40	76.9	108.8	172.0	243.2	344.	544.	769.
48	1098.451	10.98	15.53	24.56	34.73	49.12	77.67	109.8	155.3	245.6	347.3	491.	776.	1098.

R0071731

TABLE 7

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.018

CHAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT CAPACITY - CUBIC FEET PER SECOND												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
3	0.638	0.006	0.009	0.014	0.020	0.02	0.04	0.06	0.09	0.14	0.20	0.28	0.45	0.63
4	1.374	0.013	0.019	0.030	0.043	0.06	0.09	0.13	0.19	0.30	0.43	0.61	0.97	1.37
5	2.492	0.024	0.035	0.055	0.078	0.11	0.17	0.24	0.35	0.55	0.78	1.11	1.76	2.49
6	4.057	0.040	0.057	0.090	0.128	0.18	0.28	0.40	0.57	0.90	1.28	1.81	2.86	4.05
8	8.727	0.087	0.123	0.195	0.275	0.39	0.61	0.87	1.23	1.95	2.75	3.90	6.17	8.72
10	15.823	0.158	0.223	0.353	0.50	0.70	1.11	1.58	2.23	3.53	5.00	7.07	11.18	15.82
12	25.731	0.257	0.363	0.575	0.81	1.15	1.81	2.57	3.63	5.75	8.13	11.50	18.19	25.73
14	38.814	0.388	0.548	0.867	1.22	1.73	2.74	3.88	5.48	8.67	12.27	17.35	27.44	38.81
15	46.654	0.466	0.659	1.043	1.47	2.08	3.29	4.66	6.59	10.43	14.75	20.86	32.98	46.65
16	55.415	0.554	0.783	1.239	1.75	2.47	3.91	5.54	7.83	12.39	17.52	24.78	39.18	55.41
18	75.964	0.75	1.07	1.69	2.39	3.39	5.36	7.58	10.72	16.96	23.9	33.9	53.6	75.8
20	100.475	1.00	1.42	2.24	3.17	4.49	7.10	10.04	14.20	22.46	31.7	44.9	71.0	100.4
21	114.436	1.14	1.61	2.55	3.61	5.11	8.09	11.44	16.19	25.58	36.1	51.1	80.9	114.4
24	163.384	1.63	2.31	3.65	5.16	7.30	11.55	16.33	23.10	36.53	51.6	73.0	115.5	163.3
27	223.674	2.23	3.16	5.00	7.07	10.00	15.81	22.36	31.63	50.01	70.7	100.0	158.1	223.6
30	296.235	2.96	4.18	6.62	9.36	13.24	20.94	29.6	41.8	66.2	93.6	132.	209.	296.
36	481.711	4.81	6.81	10.77	15.23	21.54	34.06	48.1	68.1	107.7	152.3	215.	340.	481.
42	726.427	7.26	10.27	16.24	22.97	32.49	51.38	72.6	102.7	162.4	229.7	324.	513.	726.
48	1037.426	10.37	14.67	23.19	32.80	46.39	73.35	103.7	146.7	231.9	328.0	463.	733.	1037.

R0071732

TABLE 8

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S "N" - 0.019

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}\ A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT CAPACITY - CUBIC FEET PER SECOND												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
3	0.604	0.006	0.008	0.013	0.019	0.02	0.04	0.06	0.08	0.13	0.19	0.27	0.42	0.60
4	1.302	0.013	0.018	0.029	0.041	0.05	0.09	0.13	0.18	0.29	0.41	0.58	0.92	1.30
5	2.360	0.023	0.033	0.052	0.074	0.10	0.16	0.23	0.33	0.52	0.74	1.05	1.66	2.36
6	3.839	0.038	0.054	0.085	0.121	0.17	0.27	0.38	0.54	0.85	1.21	1.71	2.71	3.83
8	8.268	0.082	0.116	0.184	0.261	0.36	0.58	0.82	1.16	1.84	2.61	3.69	5.84	8.26
10	14.991	0.149	0.212	0.335	0.47	0.67	1.06	1.49	2.12	3.35	4.74	6.70	10.60	14.99
12	24.377	0.243	0.344	0.545	0.77	1.09	1.72	2.43	3.44	5.45	7.70	10.90	17.23	24.37
14	36.771	0.367	0.520	0.822	1.16	1.64	2.60	3.67	5.20	8.22	11.62	16.44	26.00	36.77
15	44.198	0.441	0.625	0.988	1.39	1.97	3.12	4.41	6.25	9.88	13.97	19.76	31.25	44.19
16	52.499	0.524	0.742	1.173	1.66	2.34	3.71	5.24	7.42	11.73	16.60	23.47	37.12	52.49
18	71.871	0.71	1.01	1.60	2.27	3.21	5.08	7.18	10.16	16.07	22.7	32.1	50.8	71.8
20	95.187	0.95	1.34	2.12	3.01	4.25	6.73	9.51	13.46	21.28	30.1	42.5	67.3	95.1
21	108.413	1.08	1.53	2.42	3.42	4.84	7.66	10.84	15.33	24.24	34.2	48.4	76.6	108.4
24	154.785	1.54	2.18	3.46	4.89	6.92	10.94	15.47	21.88	34.61	48.9	69.2	109.4	154.7
27	211.902	2.11	2.99	4.73	6.70	9.47	14.98	21.19	29.96	47.38	67.0	94.7	149.8	211.9
30	280.644	2.80	3.96	6.27	8.87	12.55	19.84	28.0	39.6	62.7	88.7	125.	198.	280.
36	456.359	4.56	6.45	10.20	14.43	20.40	32.26	45.6	64.5	102.0	144.1	204.	322.	456.
42	688.384	6.88	9.73	15.39	21.76	30.78	48.67	68.8	97.3	153.9	217.6	307.	486.	688.
48	982.824	9.82	13.89	21.97	31.07	43.95	69.49	98.2	138.9	219.7	310.7	439.	694.	982.

R0071733

TABLE 9

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.020

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.574	0.005	0.008	0.012	0.018	0.02	0.04	0.05	0.08	0.12	0.18	0.25	0.40	0.57
4	1.237	0.012	0.017	0.027	0.039	0.05	0.08	0.12	0.17	0.27	0.39	0.55	0.87	1.23
5	2.242	0.022	0.031	0.050	0.070	0.10	0.15	0.22	0.31	0.50	0.70	1.00	1.58	2.24
6	3.647	0.036	0.051	0.081	0.115	0.16	0.25	0.36	0.51	0.81	1.15	1.63	2.57	3.64
8	7.854	0.078	0.111	0.175	0.248	0.35	0.55	0.78	1.11	1.75	2.48	3.51	5.55	7.85
10	14.241	0.142	0.201	0.318	0.45	0.63	1.00	1.42	2.01	3.18	4.50	6.36	10.07	14.24
12	23.158	0.231	0.327	0.517	0.73	1.03	1.63	2.31	3.27	5.17	7.32	10.35	16.37	23.15
14	34.932	0.349	0.494	0.781	1.10	1.56	2.47	3.49	4.94	7.81	11.04	15.62	24.70	34.93
15	41.988	0.419	0.593	0.938	1.32	1.87	2.96	4.19	5.93	9.38	13.27	18.77	29.69	41.98
16	49.874	0.498	0.705	1.115	1.57	2.23	3.52	4.98	7.05	11.15	15.77	22.30	35.26	49.87
18	68.278	0.68	0.96	1.52	2.15	3.05	4.82	6.82	9.65	15.26	21.5	30.5	48.2	68.2
20	90.428	0.90	1.27	2.02	2.85	4.04	6.39	9.04	12.78	20.22	28.5	40.4	63.9	90.4
21	102.993	1.02	1.45	2.30	3.25	4.60	7.28	10.29	14.56	23.02	32.5	46.0	72.8	102.9
24	147.045	1.47	2.07	3.28	4.65	6.57	10.39	14.70	20.79	32.88	46.5	65.7	103.9	147.0
27	201.307	2.01	2.84	4.50	6.36	9.00	14.23	20.13	28.46	45.01	63.6	90.0	142.3	201.3
30	266.612	2.66	3.77	5.96	8.43	11.92	18.85	26.6	37.7	59.6	84.3	119.	188.	266.
36	433.540	4.33	6.13	9.69	13.70	19.38	30.65	43.3	61.3	96.9	137.0	193.	306.	433.
42	653.964	6.53	9.24	14.62	20.68	29.24	46.24	65.3	92.4	146.2	206.8	292.	462.	653.
48	933.683	9.33	13.20	20.87	29.52	41.75	66.02	93.3	132.0	208.7	295.2	417.	660.	933.

R0071734

TABLE 10

CAPACITY FOR CIRCULAR DRAINS FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S "N" - 0.021

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT .0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.547	0.005	0.007	0.012	0.017	0.02	0.03	0.05	0.07	0.12	0.17	0.24	0.38	0.54
4	1.178	0.011	0.016	0.026	0.037	0.05	0.08	0.11	0.16	0.26	0.37	0.52	0.83	1.17
5	2.136	0.021	0.030	0.047	0.067	0.09	0.15	0.21	0.30	0.47	0.67	0.95	1.51	2.13
6	3.473	0.034	0.049	0.077	0.109	0.15	0.24	0.34	0.49	0.77	1.09	1.55	2.45	3.47
8	7.480	0.074	0.105	0.167	0.236	0.33	0.52	0.74	1.05	1.67	2.36	3.34	5.28	7.48
10	13.563	0.135	0.191	0.303	0.42	0.60	0.95	1.35	1.91	3.03	4.28	6.06	9.59	13.56
12	22.055	0.220	0.311	0.493	0.69	0.98	1.55	2.20	3.11	4.93	6.97	9.86	15.59	22.05
14	33.269	0.332	0.470	0.743	1.05	1.48	2.35	3.32	4.70	7.43	10.52	14.87	23.52	33.26
15	39.989	0.399	0.565	0.894	1.26	1.78	2.82	3.99	5.65	8.94	12.64	17.88	28.27	39.98
16	47.499	0.474	0.671	1.062	1.50	2.12	3.35	4.74	6.71	10.62	15.02	21.24	33.58	47.49
18	65.027	0.65	0.91	1.45	2.05	2.90	4.59	6.50	9.19	14.54	20.5	29.0	45.9	65.0
20	86.121	0.86	1.21	1.92	2.72	3.85	6.08	8.61	12.17	19.25	27.2	38.5	60.8	86.1
21	98.086	0.98	1.38	2.19	3.10	4.38	6.93	9.80	13.87	21.93	31.0	43.8	69.3	98.0
24	140.043	1.40	1.98	3.13	4.42	6.26	9.90	14.00	19.80	31.31	44.2	62.6	99.0	140.0
27	191.721	1.91	2.71	4.28	6.06	8.57	13.55	19.17	27.11	42.87	60.6	85.7	135.5	191.7
30	253.918	2.53	3.59	5.67	8.02	11.35	17.95	25.3	35.9	56.7	80.2	113.	179.	253.
36	412.895	4.12	5.83	9.23	13.05	18.46	29.19	41.2	58.3	92.3	130.5	184.	291.	412.
42	622.823	6.22	8.80	13.92	19.69	27.85	44.04	62.2	88.0	139.2	196.9	278.	440.	622.
48	869.222	8.69	12.57	19.88	28.11	39.76	62.87	88.9	125.7	198.8	281.1	397.	626.	869.

R0071735

TABLE II

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S "N" - 0.022

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT CAPACITY - CUBIC FEET PER SECOND												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
3	0.522	0.005	0.007	0.011	0.016	0.02	0.03	0.05	0.07	0.11	0.16	0.23	0.36	0.52
4	1.124	0.011	0.015	0.025	0.035	0.05	0.07	0.11	0.15	0.25	0.35	0.50	0.79	1.12
5	2.038	0.020	0.028	0.045	0.064	0.09	0.14	0.20	0.28	0.45	0.64	0.91	1.44	2.03
6	3.315	0.033	0.046	0.074	0.104	0.14	0.23	0.33	0.46	0.74	1.04	1.48	2.34	3.31
8	7.140	0.071	0.100	0.159	0.225	0.31	0.50	0.71	1.00	1.59	2.25	3.19	5.04	7.14
10	12.946	0.129	0.183	0.289	0.40	0.57	0.91	1.29	1.83	2.89	4.09	5.79	9.15	12.94
12	21.052	0.210	0.297	0.470	0.66	0.94	1.48	2.10	2.97	4.70	6.65	9.41	14.88	21.05
14	31.756	0.317	0.449	0.710	1.00	1.42	2.24	3.17	4.49	7.10	10.04	14.20	22.45	31.75
15	38.171	0.381	0.539	0.853	1.20	1.70	2.69	3.81	5.39	8.53	12.07	17.07	26.99	38.17
16	45.340	0.453	0.641	1.013	1.43	2.02	3.20	4.53	6.41	10.13	14.33	20.27	32.06	45.34
18	62.071	0.62	0.87	1.38	1.96	2.77	4.38	6.20	8.77	13.87	19.6	27.7	43.8	62.0
20	82.207	0.82	1.16	1.83	2.59	3.67	5.81	8.22	11.62	18.38	25.9	36.7	58.1	82.2
21	93.630	0.93	1.32	2.09	2.96	4.18	6.62	9.36	13.24	20.93	29.6	41.8	66.2	93.6
24	133.618	1.33	1.89	2.98	4.22	5.97	9.45	13.36	18.90	29.89	42.2	59.7	94.5	133.6
27	183.006	1.83	2.58	4.09	5.78	8.18	12.94	18.30	25.88	40.92	57.8	81.8	129.4	183.0
30	242.374	2.42	3.42	5.41	7.66	10.83	17.13	24.2	34.2	54.1	76.6	108.	171.	242.
36	394.127	3.94	5.57	8.81	12.46	17.62	27.86	39.4	55.7	88.1	124.6	176.	278.	394.
42	594.513	5.94	8.40	13.29	18.80	26.58	42.03	59.4	84.0	132.9	188.0	265.	420.	594.
48	848.803	8.48	12.00	18.97	26.84	37.95	60.01	84.8	120.0	189.7	268.4	379.	600.	848.

R0071736

TABLE 12

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S "N" - 0.023

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT CAPACITY - CUBIC FEET PER SECOND												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
3	0.499	0.004	0.007	0.011	0.015	0.02	0.03	0.04	0.07	0.11	0.15	0.22	0.35	0.49
4	1.075	0.010	0.015	0.024	0.034	0.04	0.07	0.10	0.15	0.24	0.34	0.48	0.76	1.07
5	1.950	0.019	0.027	0.043	0.061	0.08	0.13	0.19	0.27	0.43	0.61	0.87	1.37	1.95
6	3.171	0.031	0.044	0.070	0.100	0.14	0.22	0.31	0.44	0.70	1.00	1.41	2.24	3.17
8	6.930	0.068	0.096	0.152	0.215	0.30	0.48	0.68	0.96	1.52	2.15	3.05	4.82	6.83
10	12.381	0.123	0.175	0.276	0.39	0.55	0.87	1.23	1.75	2.76	3.91	5.53	8.75	12.38
12	20.137	0.201	0.284	0.450	0.63	0.90	1.42	2.01	2.84	4.50	6.36	9.00	14.23	20.13
14	30.376	0.303	0.429	0.679	0.96	1.35	2.14	3.03	4.29	6.79	9.60	13.58	21.47	30.37
15	36.511	0.365	0.516	0.816	1.15	1.63	2.58	3.65	5.16	8.16	11.54	16.32	25.81	36.51
16	43.368	0.433	0.613	0.969	1.37	1.93	3.06	4.33	6.13	9.69	13.71	19.39	30.66	43.36
18	59.372	0.59	0.83	1.32	1.87	2.65	4.19	5.93	8.39	13.27	18.7	26.5	41.9	59.3
20	78.633	0.78	1.11	1.75	2.48	3.51	5.56	7.86	11.12	17.58	24.8	35.1	55.6	78.6
21	89.559	0.89	1.26	2.00	2.83	4.00	6.33	8.95	12.66	20.02	28.3	40.0	63.3	89.5
24	127.866	1.27	1.80	2.85	4.04	5.71	9.04	12.78	18.08	28.59	40.4	57.1	90.4	127.8
27	175.049	1.75	2.47	3.91	5.53	7.82	12.37	17.50	24.75	39.14	55.3	78.2	123.7	175.0
30	231.836	2.31	3.27	5.18	7.33	10.36	16.39	23.1	32.7	51.8	73.3	103.	163.	231.
36	376.991	3.76	5.33	8.42	11.92	16.85	26.65	37.6	53.3	84.2	119.2	168.	266.	376.
42	568.665	5.68	8.04	12.71	17.98	25.43	40.21	56.8	80.4	127.1	179.8	254.	402.	568.
48	811.848	8.11	11.48	18.15	25.67	36.30	57.40	81.1	114.8	181.5	256.7	363.	574.	811.

R0071737

TABLE 13

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.024

DRAIN DIAMETER INCHES	$\frac{1.486 R^{2/3} A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT .0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.478	0.004	0.006	0.010	0.015	0.02	0.03	0.04	0.06	0.10	0.15	0.21	0.33	0.47
4	1.030	0.010	0.014	0.023	0.032	0.04	0.07	0.10	0.14	0.23	0.32	0.46	0.72	1.03
5	1.869	0.018	0.026	0.041	0.059	0.08	0.13	0.18	0.26	0.41	0.59	0.83	1.32	1.86
6	3.039	0.030	0.042	0.067	0.096	0.13	0.21	0.30	0.42	0.67	0.96	1.35	2.14	3.03
8	6.545	0.065	0.092	0.146	0.206	0.29	0.46	0.65	0.92	1.46	2.06	2.92	4.62	6.54
10	11.867	0.118	0.167	0.265	0.37	0.53	0.83	1.18	1.67	2.65	3.75	5.30	8.39	11.86
12	19.298	0.192	0.272	0.431	0.61	0.86	1.36	1.92	2.72	4.31	6.10	8.63	13.64	19.29
14	29.110	0.291	0.411	0.650	0.92	1.30	2.05	2.91	4.11	6.50	9.20	13.01	20.58	29.11
15	34.990	0.349	0.494	0.782	1.10	1.56	2.47	3.49	4.94	7.82	11.06	15.64	24.74	34.99
16	41.561	0.415	0.587	0.929	1.31	1.85	2.93	4.15	5.87	9.29	13.14	18.58	29.39	41.56
18	56.898	0.56	0.80	1.27	1.79	2.54	4.02	5.68	8.04	12.72	17.9	25.4	40.2	56.8
20	75.356	0.75	1.06	1.68	2.38	3.37	5.32	7.53	10.65	16.85	23.8	33.7	53.2	75.3
21	85.827	0.85	1.21	1.91	2.71	3.83	6.06	8.58	12.13	19.19	27.1	38.3	60.6	85.8
24	122.538	1.22	1.73	2.74	3.87	5.48	8.66	12.25	17.32	27.40	38.7	54.8	86.6	122.5
27	167.756	1.67	2.37	3.75	5.30	7.50	11.86	16.77	23.72	37.51	53.0	75.0	118.6	167.7
30	222.176	2.22	3.14	4.96	7.02	9.93	15.71	22.2	31.4	49.6	70.2	99.	157.	222.
36	361.283	3.61	5.10	8.07	11.42	16.15	25.54	36.1	51.0	80.7	114.2	161.	255.	361.
42	544.970	5.44	7.70	12.18	17.23	24.37	38.53	54.4	77.0	121.8	172.3	243.	385.	544.
48	779.069	7.78	11.00	17.39	24.60	34.79	55.01	77.8	110.0	173.9	246.0	347.	550.	778.

R0071738

TABLE 14

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S "n" - 0.025

DRAIN DIAMETER INCHES	$\frac{1.486}{n} R^{2/3} A$	HYDRAULIC GRADIENT - FEET PER FOOT CAPACITY - CUBIC FEET PER SECOND												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
3	0.459	0.004	0.006	0.010	0.014	0.02	0.03	0.04	0.06	0.10	0.14	0.20	0.32	0.45
4	0.989	0.009	0.013	0.022	0.031	0.04	0.06	0.09	0.13	0.22	0.31	0.44	0.69	0.98
5	1.794	0.017	0.025	0.040	0.056	0.08	0.12	0.17	0.25	0.40	0.56	0.80	1.26	1.79
6	2.917	0.029	0.041	0.065	0.092	0.13	0.20	0.29	0.41	0.65	0.92	1.30	2.06	2.91
8	6.281	0.062	0.088	0.140	0.198	0.28	0.44	0.62	0.88	1.40	1.98	2.81	4.44	6.28
10	11.391	0.113	0.161	0.254	0.36	0.50	0.80	1.13	1.61	2.54	3.60	5.09	8.05	11.39
12	18.526	0.185	0.262	0.414	0.58	0.82	1.31	1.85	2.62	4.14	5.85	8.28	13.10	18.52
14	27.946	0.279	0.395	0.624	0.88	1.24	1.97	2.79	3.95	6.24	8.83	12.49	19.76	27.94
15	33.591	0.335	0.475	0.751	1.06	1.50	2.37	3.35	4.75	7.51	10.62	15.02	23.75	33.59
16	39.849	0.398	0.564	0.892	1.26	1.78	2.82	3.98	5.64	8.92	12.61	17.84	28.21	39.89
18	54.622	0.54	0.77	1.22	1.72	2.44	3.86	5.46	7.72	12.21	17.2	24.4	38.6	54.6
20	72.342	0.72	1.02	1.61	2.28	3.23	5.11	7.23	10.23	16.17	22.8	32.3	51.1	72.3
21	82.394	0.82	1.16	1.84	2.60	3.68	5.82	8.23	11.65	18.42	26.0	36.8	58.2	82.3
24	117.636	1.17	1.66	2.63	3.72	5.26	8.31	11.76	16.63	26.30	37.2	52.6	83.1	117.6
27	161.045	1.61	2.27	3.60	5.09	7.20	11.38	16.10	22.77	36.01	50.9	72.0	113.8	161.0
30	213.289	2.13	3.01	4.76	6.74	9.53	15.08	21.3	30.1	47.6	67.4	95.	150.	213.
36	346.832	3.46	4.90	7.75	10.96	15.51	24.52	34.6	49.0	77.5	109.6	155.	245.	346.
42	523.171	5.23	7.39	11.69	16.54	23.39	36.99	52.3	73.9	116.9	165.4	233.	369.	523.
48	746.946	7.46	10.56	16.70	23.62	33.40	52.81	74.6	105.6	167.0	236.2	334.	528.	746.

R0071739

TABLE 14

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S "n" = 0.025

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3} A}{n}$	HYDRAULIC GRADIENT - FEET PER FOOT CAPACITY - CUBIC FEET PER SECOND												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
3	0.459	0.004	0.006	0.010	0.014	0.02	0.03	0.04	0.06	0.10	0.14	0.20	0.32	0.45
4	0.989	0.009	0.013	0.022	0.031	0.04	0.06	0.09	0.13	0.22	0.31	0.44	0.69	0.98
5	1.794	0.017	0.025	0.040	0.056	0.08	0.12	0.17	0.25	0.40	0.56	0.80	1.26	1.79
6	2.917	0.029	0.041	0.065	0.092	0.13	0.20	0.29	0.41	0.65	0.92	1.30	2.06	2.91
8	6.287	0.062	0.088	0.140	0.198	0.28	0.44	0.62	0.88	1.40	1.98	2.81	4.44	6.28
10	11.391	0.113	0.161	0.254	0.36	0.50	0.80	1.13	1.61	2.54	3.60	5.09	8.05	11.39
12	18.526	0.185	0.262	0.414	0.58	0.82	1.31	1.85	2.62	4.14	5.85	8.28	13.10	18.52
14	27.946	0.279	0.395	0.624	0.88	1.24	1.97	2.79	3.95	6.24	8.83	12.49	19.76	27.94
15	33.591	0.335	0.475	0.751	1.06	1.50	2.37	3.35	4.75	7.51	10.62	15.02	23.75	33.59
16	39.899	0.398	0.564	0.892	1.26	1.78	2.82	3.98	5.64	8.92	12.61	17.84	28.21	39.89
18	54.622	0.54	0.77	1.22	1.72	2.44	3.86	5.46	7.72	12.21	17.2	24.4	38.6	54.6
20	72.342	0.72	1.02	1.61	2.28	3.23	5.11	7.23	10.23	16.17	22.8	32.3	51.1	72.3
21	82.394	0.82	1.16	1.84	2.60	3.68	5.82	8.23	11.65	18.42	26.0	36.8	58.2	82.3
24	117.636	1.17	1.66	2.63	3.72	5.26	8.31	11.76	16.63	26.30	37.2	52.6	83.1	117.6
27	161.045	1.61	2.27	3.60	5.09	7.20	11.38	16.10	22.77	36.01	50.9	72.0	113.8	161.0
30	213.289	2.13	3.01	4.76	6.74	9.53	15.08	21.3	30.1	47.6	67.4	95.	150.	213.
36	346.832	3.46	4.90	7.75	10.96	15.51	24.52	34.6	49.0	77.5	109.6	155.	245.	346.
42	523.171	5.23	7.39	11.69	16.54	23.39	36.99	52.3	73.9	116.9	165.4	233.	369.	523.
48	746.946	7.46	10.56	16.70	23.62	33.40	52.91	74.6	105.6	167.0	236.2	334.	528.	746.

R0071740

TABLE 15

CAPACITY FOR CIRCULAR DRAINS
FLOWING FULL - CUBIC FEET PER SECOND

MANNING'S 'N' - 0.026

DRAIN DIAMETER INCHES	$\frac{1.486\ R^{2/3}A}{N}$	HYDRAULIC GRADIENT - FEET PER FOOT												
		.0001	.0002	.0005	.001	.002	.005	.01	.02	.05	0.1	0.2	0.5	1.0
		CAPACITY - CUBIC FEET PER SECOND												
3	0.441	0.004	0.006	0.009	0.013	0.01	0.03	0.04	0.06	0.09	0.13	0.19	0.31	0.44
4	0.951	0.009	0.013	0.021	0.030	0.04	0.06	0.09	0.13	0.21	0.30	0.42	0.67	0.95
5	1.725	0.017	0.024	0.038	0.054	0.07	0.12	0.17	0.24	0.38	0.54	0.77	1.21	1.72
6	2.805	0.028	0.039	0.062	0.088	0.12	0.19	0.28	0.39	0.62	0.88	1.25	1.98	2.80
8	6.042	0.060	0.085	0.135	0.191	0.27	0.42	0.60	0.85	1.35	1.91	2.70	4.27	6.04
10	10.955	0.109	0.154	0.244	0.34	0.48	0.77	1.09	1.54	2.44	3.46	4.89	7.74	10.95
12	17.814	0.178	0.251	0.398	0.56	0.79	1.25	1.78	2.51	3.98	5.63	7.96	12.59	17.81
14	26.871	0.268	0.380	0.600	0.84	1.20	1.90	2.68	3.80	6.00	8.49	12.01	19.00	26.87
15	32.299	0.322	0.456	0.722	1.02	1.44	2.28	3.22	4.56	7.22	10.21	14.44	22.83	32.29
16	38.364	0.383	0.542	0.857	1.21	1.71	2.71	3.83	5.42	8.57	12.11	17.15	27.12	38.36
18	52.521	0.52	0.74	1.17	1.66	2.34	3.71	5.25	7.42	11.74	16.6	23.4	37.1	52.5
20	69.560	0.69	0.98	1.55	2.19	3.11	4.91	6.95	9.83	15.55	21.9	31.1	49.1	69.5
21	79.225	0.79	1.12	1.77	2.50	3.54	5.60	7.92	11.20	17.71	25.0	35.4	56.0	79.2
24	113.112	1.13	1.59	2.52	3.57	5.05	7.99	11.31	15.99	25.29	35.7	50.5	79.9	113.1
27	154.851	1.54	2.18	3.46	4.89	6.92	10.94	15.48	21.89	34.62	48.9	69.2	109.4	154.8
30	205.086	2.05	2.90	4.58	6.48	9.17	14.50	20.5	29.0	45.8	64.8	91.	145.	205.
36	333.492	3.33	4.71	7.45	10.54	14.91	23.58	33.3	47.1	74.5	105.4	149.	235.	333.
42	503.049	5.03	7.11	11.24	15.90	22.49	35.57	50.3	71.1	112.4	159.0	224.	355.	503.
48	718.218	7.18	10.15	16.05	22.71	32.11	50.78	71.8	101.5	160.5	227.1	321.	507.	718.

R0071741

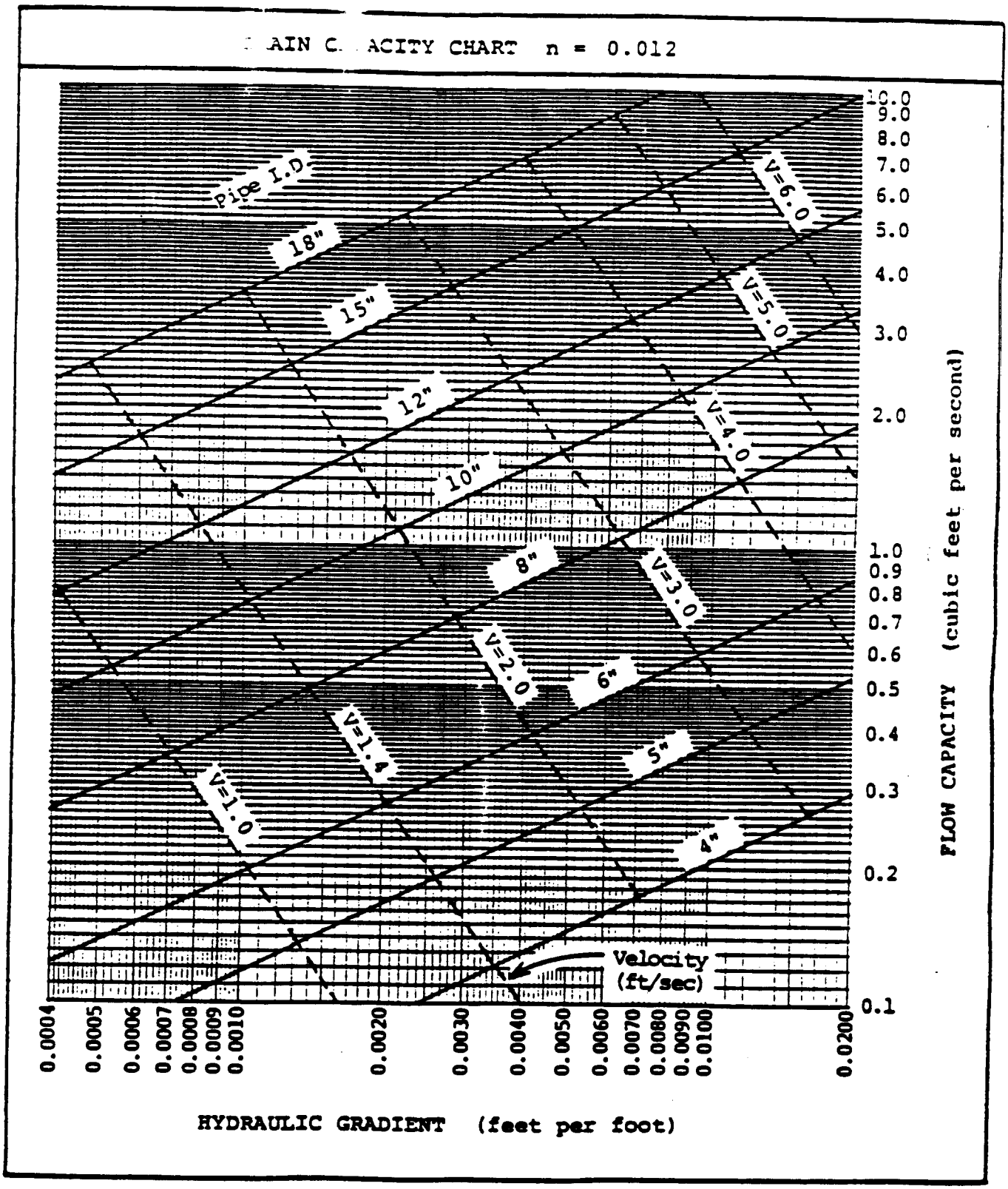
TABLE 16

ACRES DRAINED BY VARIOUS DISCHARGES OR CAPACITIES
AND DRAINAGES COEFFICIENTS *

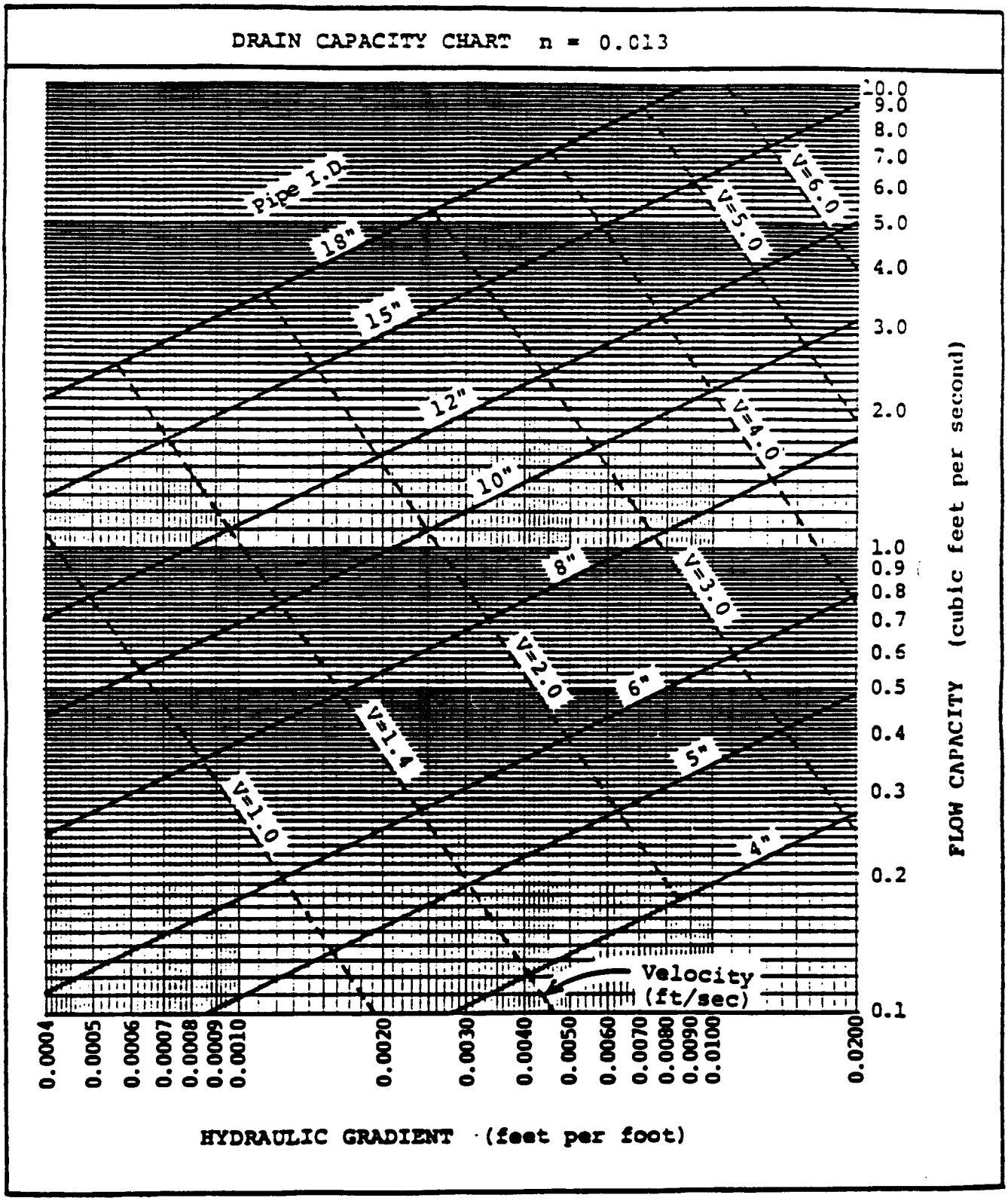
DISCHARGE OR CAPACITY CFS	DRAINAGE COEFFICIENT (INCHES IN 24 HOURS)										
	1/4	3/8	1/2	3/4	1	1 1/2	2	2 1/2	3	3 1/2	4
	ACRES DRAINED										
0.1	9.52	6.35	4.76	3.17	2.38	1.59	1.19	0.95	0.79	0.68	0.60
0.2	19.04	12.69	9.52	6.35	4.76	3.17	2.38	1.90	1.59	1.36	1.19
0.3	28.56	19.04	14.28	9.52	7.14	4.76	3.57	2.86	2.38	2.04	1.79
0.4	38.08	25.39	19.04	12.69	9.52	6.35	4.76	3.81	3.17	2.72	2.38
0.5	47.60	31.74	23.80	15.87	11.90	7.93	5.95	4.76	3.97	3.40	2.98
0.6	57.12	38.08	28.56	19.04	14.28	9.52	7.14	5.71	4.76	4.08	3.57
0.7	66.64	44.43	33.32	22.21	16.66	11.11	8.33	6.66	5.55	4.76	4.17
0.8	76.17	50.78	38.08	25.39	19.04	12.69	9.52	7.62	6.35	5.44	4.76
0.9	85.69	57.12	42.84	28.56	21.42	14.28	10.71	9.57	7.14	6.12	5.36
1.0	95.21	63.47	47.60	31.74	23.80	15.87	11.90	9.52	7.93	6.80	5.95
2.0	190.41	126.94	95.21	63.47	47.60	31.74	23.80	19.04	15.87	13.60	11.90
3.0	285.62	190.41	142.81	95.21	71.40	47.60	35.70	28.56	23.80	20.40	17.85
4.0	380.83	253.88	190.41	126.94	95.21	63.47	47.60	38.08	31.74	27.20	23.80
5.0	476.03	317.35	238.02	158.68	119.01	79.34	59.50	47.60	39.67	34.00	29.75
6.0	571.24	380.83	285.62	190.41	142.81	95.21	71.40	57.12	47.60	40.80	35.70
7.0	666.44	444.30	333.22	222.15	166.61	111.07	83.31	66.64	55.54	47.60	41.65
8.0	761.65	507.77	380.83	253.88	190.41	126.94	95.21	76.17	63.47	54.40	47.60
9.0	856.86	571.24	428.43	285.62	214.21	142.81	107.11	85.69	71.40	61.20	53.55
10.0	952.06	634.71	476.03	317.35	238.02	158.68	119.01	95.21	79.34	68.00	59.50
20.0	1904.13	1269.42	952.06	634.71	476.03	317.35	238.02	190.41	158.68	136.01	119.01
30.0	2856.19	1904.13	1428.10	952.06	714.05	476.03	357.02	285.62	238.02	204.01	178.51
40.0	3808.26	2538.84	1904.13	1269.42	952.06	634.71	476.03	380.83	317.35	272.02	238.02
50.0	4760.32	3173.55	2380.16	1586.77	1190.08	793.39	595.04	476.03	396.69	340.02	297.52
60.0	5712.38	3808.26	2856.19	1904.13	1428.10	952.06	714.05	571.24	476.03	408.01	357.02
70.0	6664.45	4442.97	3332.22	2221.48	1666.11	1110.74	833.06	666.44	555.37	476.03	416.53
80.0	7616.51	5077.67	3808.26	2538.84	1904.13	1269.42	952.06	761.65	634.71	544.04	476.03
90.0	8569.58	5712.38	4284.29	2856.19	2142.14	1428.10	1071.07	856.86	714.05	612.04	535.54
100.0	9520.64	6347.09	4760.32	3173.55	2380.16	1586.77	1190.08	952.06	793.39	680.05	595.04

DRAINAGE COEFFICIENT IS THE DEPTH OF WATER REMOVED IN A 24-HOUR A PERIOD.

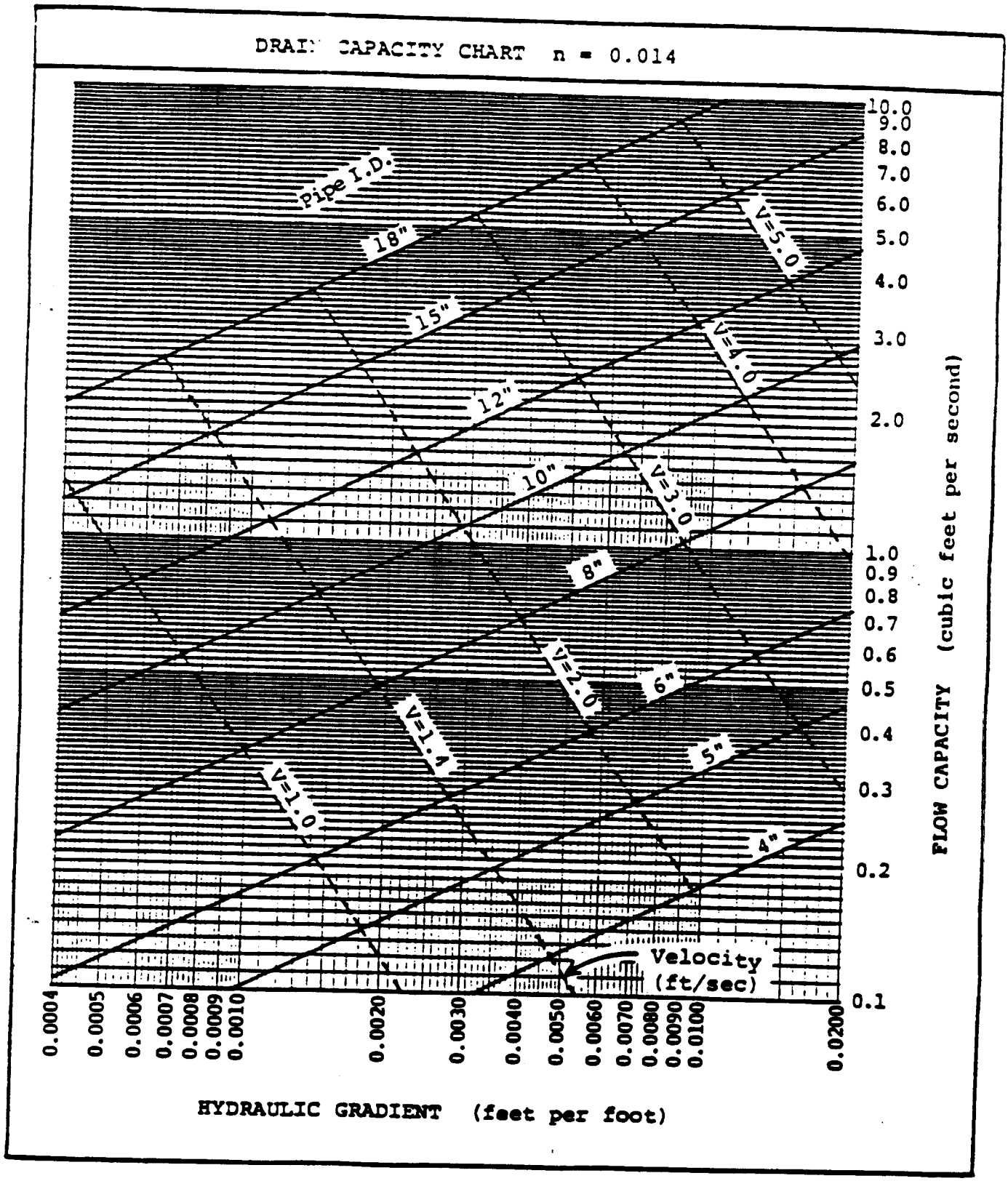
R0071742


AIN C. ACITY CHART n = 0.012
Pipe I.D.
18"
15"
12"
10"
8"
6"
5"
4"
V=6.0
V=5.0
V=4.0
V=3.0
V=2.0
V=1.4
V=1.0
Velocity (ft/sec)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
FLOW CAPACITY (cubic feet per second)
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
0.0090
0.0100
0.0200
HYDRAULIC GRADIENT (feet per foot)

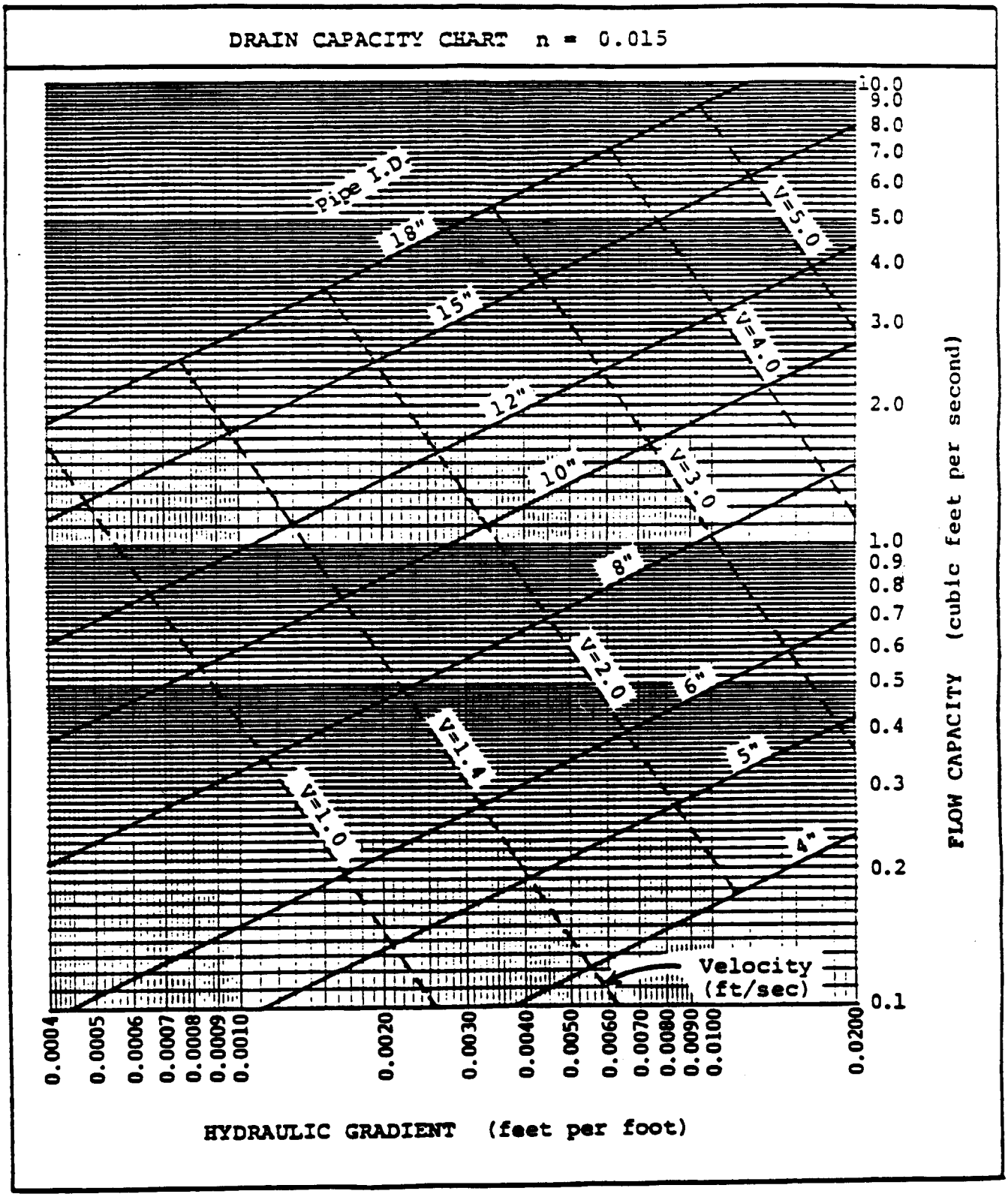
R0071743


DRAIN CAPACITY CHART n = 0.013
Pipe I.D.
18"
15"
12"
10"
8"
6"
5"
4"
V=6.0
V=5.0
V=4.0
V=3.0
V=2.0
V=1.4
V=1.0
Velocity (ft/sec)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
FLOW CAPACITY (cubic feet per second)
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
0.0090
0.0100
0.0200
HYDRAULIC GRADIENT (feet per foot)

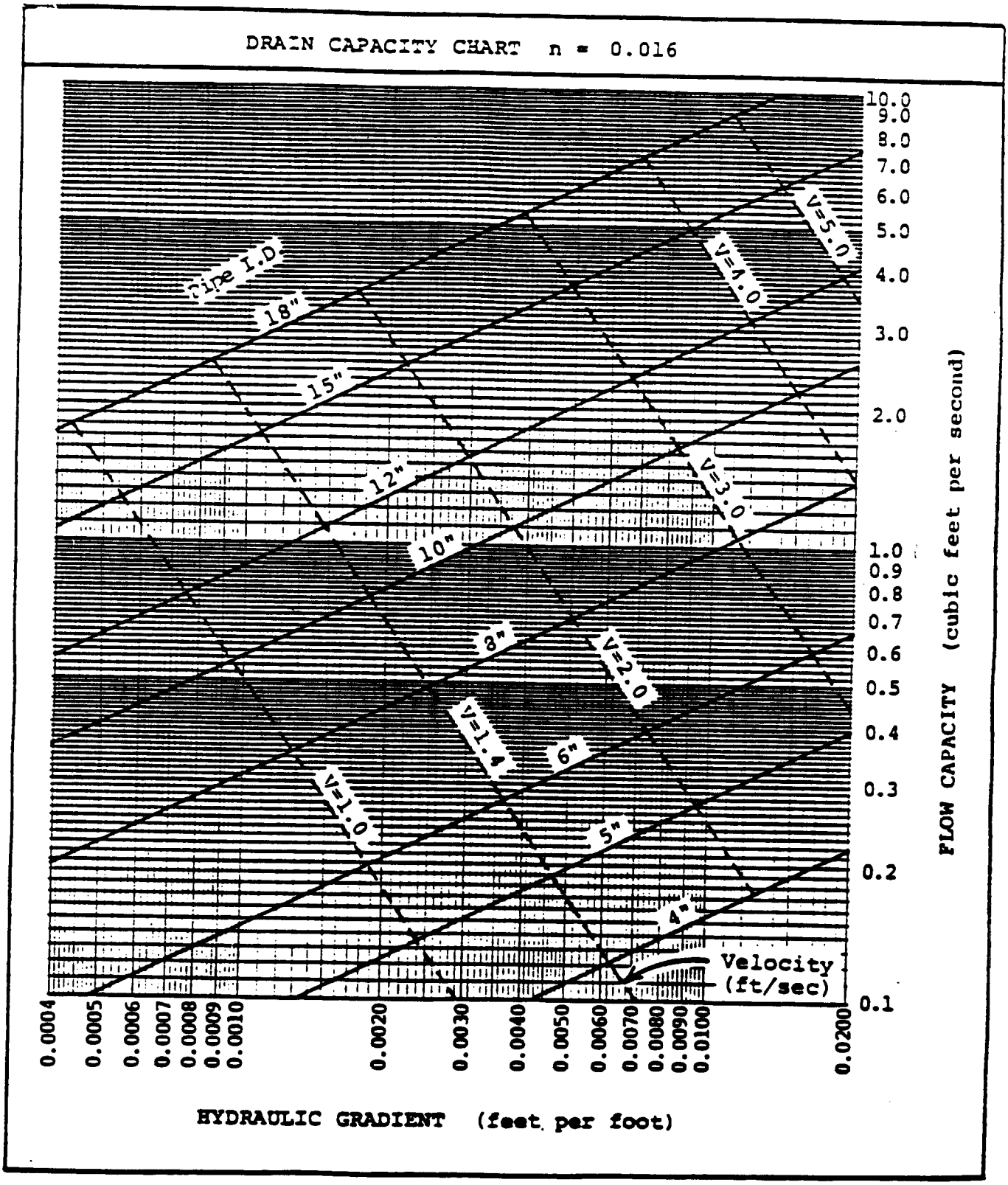
R0071744


DRAIN CAPACITY CHART n = 0.014
Pipe I.D.
18"
15"
12"
10"
8"
6"
5"
4"
V=5.0
V=4.0
V=3.0
V=2.0
V=1.4
V=1.0
Velocity (ft/sec)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
FLOW CAPACITY (cubic feet per second)
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
0.0090
0.0100
0.0200
HYDRAULIC GRADIENT (feet per foot)

R0071745


DRAIN CAPACITY CHART n = 0.015
Pipe I.D.
18"
15"
12"
10"
8"
6"
5"
4"
V=5.0
V=4.0
V=3.0
V=2.0
V=1.4
V=1.0
Velocity (ft/sec)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
FLOW CAPACITY (cubic feet per second)
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.0010
0.0020
0.0030
0.0040
0.0050
0.0060
0.0070
0.0080
0.0090
0.0100
0.0200
HYDRAULIC GRADIENT (feet per foot)

R0071746


DRAIN CAPACITY CHART n = 0.016
Pipe I.D
18"
15"
12"
10"
8"
6"
5"
4"
V=5.0
V=4.0
V=3.0
V=2.0
V=1.4
V=1.0
Velocity (ft/sec)
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
FLOW CAPACITY (cubic feet per second)
0.0004
0.0005
0.0006
0.0007
0.0008
0.0009
0.0010
0.0020
0.0030
0.0040
0.0050
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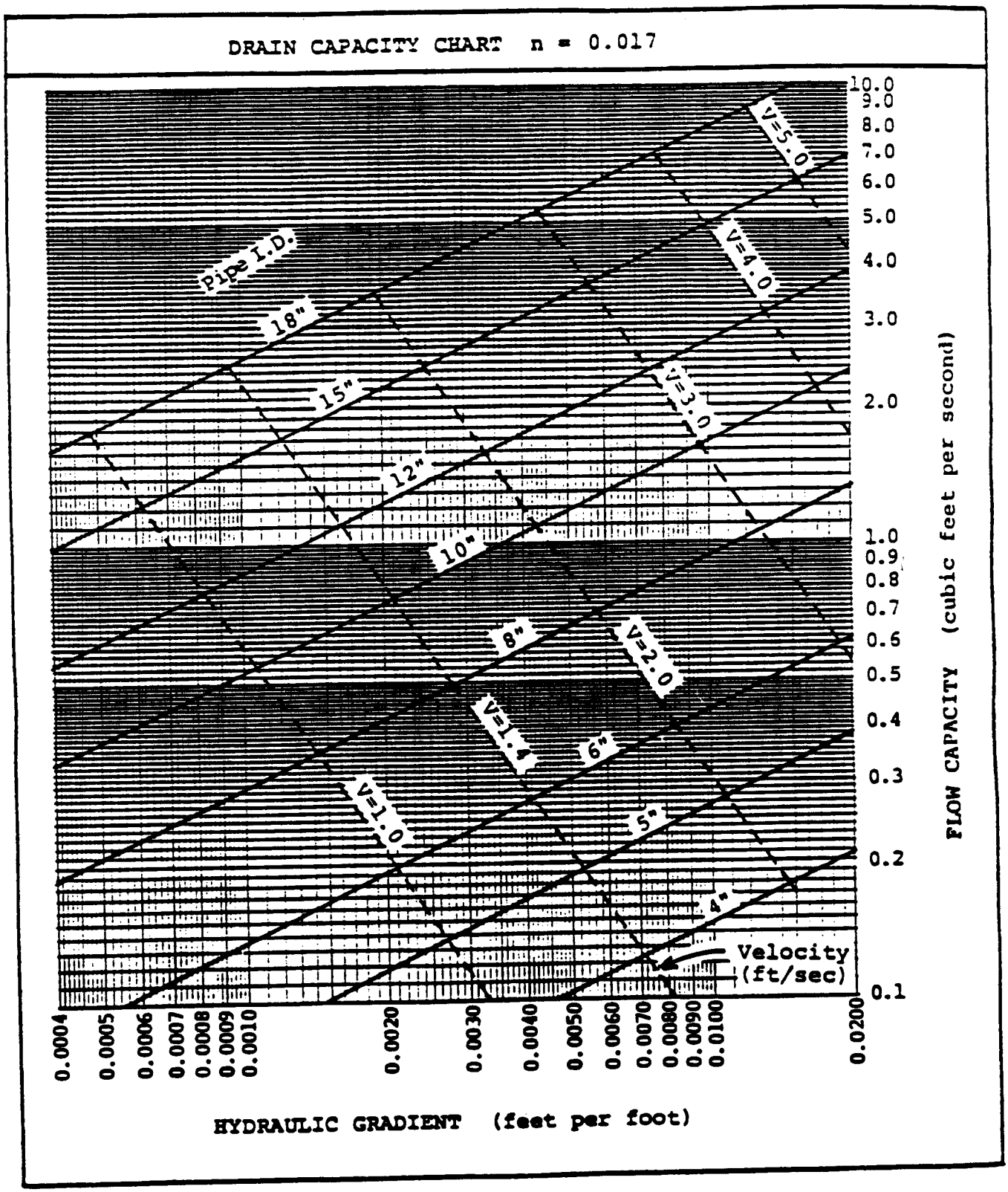
R0071747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Velocity (ft/sec)
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FLOW CAPACITY (cubic feet per second)
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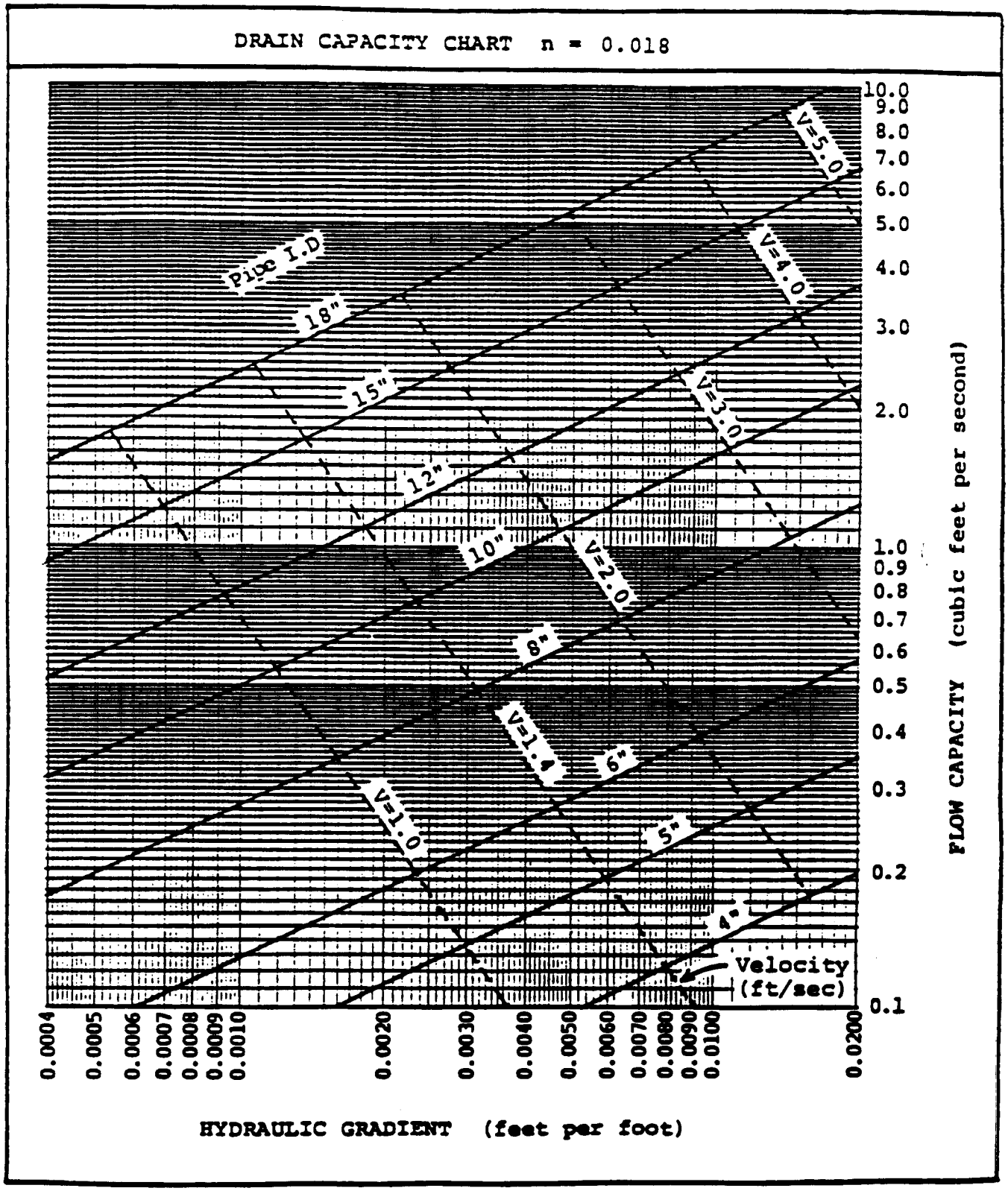
HYDRAULIC GRADIENT (feet per foot)

R0071748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FLOW CAPACITY (cubic feet per second)
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HYDRAULIC GRADIENT (feet per foot)

R0071749

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

CERTIFIED ORIGINAL

TRANSCRIPT OF
PUBLIC MEETING/HEARING
City of Camarillo, Council Chambers
601 Carmen Drive
Camarillo, California
Wednesday, April 22, 1999
9:00 A.M.

REPORTED BY:
Katherine Gale,
CSR 9793
Our File No. 1-54243

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to make everything consistent and then tell us what the inconsistent ones are between the other cases.

MR. COE: Until we have a model.

MR. KESTON: So that we create a model. And the model may change.

MR. NAHAI: With other prospective cases, I don't think it would be right to make the parties wait.

MR. COE: There's a lot of money involved.

MS. LYON: Right.

MR. NAHAI: Shall we break for lunch?

MR. LEON: Return time is 2:45, and the Board, during the lunch hour, will meet in closed session to discuss current litigation cases, including ongoing litigation: Long Beach versus Regional Board, City of Los Angeles, a petition case; City of Thousand Oaks, another petition case; and Malibu Cross Creek, a litigation case.

MR. NAHAI: Going on to No. 16, will you read the statement.

MS. GOODMAN: Sure.

This is a public meeting to consider board action of consideration of recommended best management practices for development planning and

construction for municipal storm water programs in Los Angeles County. Copies of this resolution were sent to the state Water Resources Control Board and other interested agencies, persons, and organizations.

The order of presentation of testimony at this meeting will be: board staff, public agencies, other interested agencies and groups. Anyone so desiring will be heard. If you haven't filled out one of the blue cards located on the table at the back of the room, please raise your hand and we'll get a card for you to fill out.

It would be appreciated if all persons appearing before the Board today will leave written copies of their testimony, if available. The Board will consider all testimony. However, in the interest of time, it is requested that all repetitive and redundant statements be avoided.

The setting of time limits for the presentation of evidence is at the discretion of the Board.

The hearing will now be open.

MR. NAHAI: Could each person who's going to give testimony on this item, could you please stand. Could you raise your right hand and

repeat after me.

UNIDENTIFIED SPEAKERS,

having been duly sworn, testified as follows:

MR. NAHAI: With that we'll declare the public hearing open, and could we have staff presentations.

MR. SWAMIKANNU: Mr. Chairman and respected members of the Board, I have the unenviable position of making a staff presentation after you let the public speaker, Dr. Gold, steal my thunder.

But in any case. My name is Xavier Swamikannu. I'm and engineer on Board staff. Today I present for your consideration a draft resolution for approval of best management practices for developing planning and developing construction under the Municipal Storm Water Permit for Los Angeles County.

Best management practices are methods for reducing pollution in storm water in urban runoff. You have been asked today to approve a master list of best management practices for use by municipalities in construction and planning approval programs within their departments.

Now, for some background.

The L.A. County Municipal Storm Water

Permit was adopted by this Board on July 15, 1996. The program or the permit, which is issued under federal and state law, covers 85 cities and the unincorporated areas of L.A. County. The purpose of the permit is to minimize storm water pollution that emanates from urbanized areas.

The permit itself is a program and it has nine components.

The first program management which talks about the legal authority required to enforce the permit by the municipalities. It talks about relationships between the principal permittee and the co-permittees.

The second is component of the permit is illicit connections and elicit discharges elimination. This is to basically control unauthorized discharges to the storm drain system.

The third component is public agency activities. Here we hold municipal operations to the same standard that we hold business and private industry.

The purpose of today's meeting is the next component, development -- planning and development construction.

We also have a public information

participation outreach program. We have a monitoring program in the permit to ensure that we measure the progress as well as determine if our beneficial users are being impaired or is improvement happening.

And finally, we have a compliance requirement which basically requires reporting and evaluation of implementation.

Now, for today's discussion, the Board is being asked to consider BMPs under the planning and construction components, and this is a subset of the requirements that has come to the Board.

Under the planning we have planning priority projects basically setting aside specific requirements for home subdivisions, 10 homes, 100 homes. In addition to that, we have certainly commercial facilities when they're being planned that certain BMPs be considered. These include gas stations and restaurant establishments.

The requirement here is that Urban Storm Water Mitigation Plan be prepared and submitted to the local municipality. Within the Urban Storm Water Mitigation Plans, you will have the BMPs, a broad base of BMPs.

The second component is construction, a priority construction. And under priority

construction for the municipal program, the scrutiny is only for those projects between two and five acres. Five acres and greater are handled under a separate permit program from the State directly.

Under the construction priority projects, what you have is a requirement to prepare a local storm water pollution plan or wet weather erosion control plans.

Within these plans the permittees are required to identify best management practices. As I explained earlier, these are source or structural or treatment control measures to reduce pollutions that -- to reduce pollutants that enter storm water.

What you have in the agenda package is a master list of BMPs, of best management practices, that the cities are to consider for adoption when these plans are brought before them by developers or builders. These BMPs have been taken from the state handbooks, which have been widely used since 1990.

We have received three sets of comments on the -- on the BMPs that are for consideration. The first set of comments is on a clarification on the Standard Storm Water Urban Runoff Mitigation Plan. And that is an issue which is not before you for discussion today.

The Urban Storm Water Mitigation Plans are approved by the executive officer. They will have very specific BMPs when they're presented to him for consideration. It's our intent at that time to solicit public comment.

The second set of comments was submitted by Heal the Bay. And they have requested that we consider additional BMPs that are not presently on the master list. These include source control measures, like maintenance; erosion sediment control measures, like using geotextile masks; treatment control systems, such is as catch basin inserts and other systems.

Finally, I'll go to my recommendation, or staff recommendation, that the Board adopt the draft resolution with the following changes:

Direct staff to supplement the master list with additional BMPs that have been submitted by Heal the Bay as well as the Western States Petroleum Association, and consider favorably the clarification which will be provided by the City of Los Angeles on the use of the best management practices list with discretion on the proper language to be given to the executive officer.

My presentation is concluded.

Questions?

MR. NAHAI: Any questions?

MS. DIAMOND: I have a question: Considering the memo that you got -- we all got from Heal the Bay -- and you've incorporated some of that in this recommendation -- what is your feeling about the recommendation for the brief description of each BMP? And what about the making it more useful by organizing it in a way that will be a little more user-friendly? Would you comment on that.

MR. SWAMIKANNU: Yes. The plans that I talked about, Urban Storm Water Mitigation Plans, will be prepared by the L.A. County; and therefore, they are for each of those sectors, for example, 10-homes subdivision, 100-home subdivision. And we think the details should be in that plan because that's the document that the developer or whoever is going to use.

What you are being asked to act on today is on the broader list of BMPs that ought to be considered for all these projects. The technical details will be handled in the latter -- later document. So certainly I think there is a need for better description and better identity, but that will be handled at the plan level, at the Urban Storm

Water Mitigation Plan level. And it's my understanding that's already being done.

I -- we have not looked at the storm water urban mitigation plans yet, but I've seen a draft copy from one of the permittees. I've also seen a draft from the City, and the intent of the document is to provide more detail.

Does that answer your question?

MS. DIAMOND: Yes, I think.

MR. NAHAI: Any other questions? Thank you.

MR. SWAMIKANNU: Thank you, Mr. Chairman.

MR. NAHAI: I'll move on to calling out the speakers who provided cards, and I won't take this in any particular order.

First, Mr. Charles Gale.

MR. GALE: Good afternoon, Chairman and Board members. My name is Charles Gale. I'm with the Building Industry Association of Southern California. I work in the regional office in Diamond Bar, California.

I have recently passed out some comments to your staff here about the BMPs that are taken from the California Storm Water Best Management

Practice Handbook for Construction Activity, which was published by the California Storm Water Quality Task Force. Our members have been using some of these BMPs since they've been adopted, since is 1993.

My comments today on the resolution are twofold: We're recommending that the Regional Board resolution encourage the permittees to update the BMP list periodically to reflect advances in scientific understanding and BMP developments.

Lastly, we're recommending the permittees to be encouraged to adopt flexible BMP programs that work for our industry. There has been a lot of discussion about what works on the East Coast may not work out here with our climate and soil conditions. So we would like you to, hopefully, add that to your recommendations through the Board resolution today.

Thank you.

MR. NAHAI: Do you -- I had one question.

MR. GALE: Yes.

MR. NAHAI: Do you have specific suggestions that you would like to be added to the BMPs that are going to get adopted today?

MR. GALE: Not to the BMPs but to the

resolution. I'd allow it some flexibility in updating the BMPs by the permittees.

MR. NAHAI: Thank you.

MR. GALE: Thank you.

MR. NAHAI: Mr. Steve Fleischli, please.

MR. FLEISCHLI: Good afternoon, members of the Board. Steve Fleischli, Santa Monica Bay Keeper, P.O. Box 10096, Marina Del Rey 90295.

I want to talk a little bit about why we're doing this, and I'm sure most of you know Section 402P of the Clean Water Act requires, essentially, that a reduction of pollution be achieved to the maximum extent practicable. I think it's good that we are developing a list of BMPs, but what we really need is something that moves forward towards the goals of the Clean Water Act. What we need is the linkages that are necessary.

And today we talked about there's a mitigation plan that's coming later that's going to provide all the technical detail that this Board likely will never see because the executive officer will be reviewing that, and we'll never really know where all these link together.

Our -- one of our main concerns is that

the way this is set out -- and Mark Gold talked about this issue a little bit earlier, and he certainly has been much more involved than I have on these issues.

But so you have a list of BMPs; so what? So what? In our resolution we have that these BMPs may be considered by permittees. So what? In here there's no mention whatsoever of the maximum extent practical. There's no mention whatsoever of the goal of reducing pollution utilizing these BMPs. There's no mandate whatsoever that certain land use practices incorporate treatment, for example. One example that Mark gave was with regard to parking lots and things like that.

There should be something in there that says you have to have some type of treatment at the end of your parking lot. I don't care what type it is. You know, you need the flexibility. I agree with that. But you got to do something. It all should be treated.

Those are the types of issues that we should be addressing, and my concern is that these two documents -- the BMP list and this mitigation plan with the technical information -- are considered separately and that they're not looked at in a holistic approach that we're really going to miss the

boat on why we're doing this at all.

So those are my comments. I'd be happy to provide, you know, more detail if you want me to.

MR. NAHAI: Questions for Mr. Fleischli? Maybe later on.

MR. FLEISCHLI: All right. Thanks.

THE NAHAI: Thank you.

Next Mr. Jim Langley, please.

MR. LANGLEY: Good afternoon, President Nahai and Board members. I'm Jim Langley, assistant director of the Bureau of Sanitation. And I want to thank you for the opportunity to speak very briefly here. I know you've had a lot of testimony today.

The City of L.A. is very supportive and in fact enthusiastic about the storm water program, urban runoff programs, but we also recognize that the BMPs are the heart of the development and construction planning programs. And we are committed to meeting our part of the permit requirements by July 30, 1999.

But as a point of clarification, we request that the BMP's listing be considered more as a menu of potential BMPs. Because we believe that, since the cost and pollution-control benefits were not considered originally in the evaluation for all

of these BMPs because data simply was not available, that this is a very important aspect that we need to cover before these BMPs are actually implemented.

I just distributed copies of our modifications to the resolution already, and I -- those, I think, have been distributed.

Once again, I thank you for the opportunity to speak. Are there any questions?

MR. NAHAI: Any questions of Mr. Langley? Thank you.

MR. LANGLEY: Thanks.

MR. NAHAI: Mr. Michael Kissel, please.

MR. KISSEL: Good afternoon, Mr. Chairman, members of the Board, and staff members. My name is Michael Kissel. I'm the environmental health compliance specialist with CKE Restaurants, dba Carl's Jr. Restaurants.

I'm here today to address issues of the BMP, the seven items that were listed for Restaurant Standard Urban Storm Water Mitigation Plan, for that plan just real briefly, and I've got to consolidate for the sake of time because I promised I will be brief.

Areas regarding design of equipment and accessory wash areas which also translate into

outdoor material storage areas which also -- translate also to properly designed trash storage areas, these are all, as far as quick-service restaurants are concerned, basically are trash enclosures and trash corrals. And they call for a lot of expenses that we feel can somewhat -- we see merit and we understand the necessity for drains in those areas, but for coverings berms and dikes, we feel that the incorporation of BMPs, which we already have in place in our restaurants, would be sufficient.

Areas regarding rooftop, the treatment of that, many of that -- much of that is subject to the hood-cleaning services that we have, and that's something I think we need to discuss with staff.

The control of parking lot runoff, that's a big challenge for us, and that's something we're working on. And again, we would like to work with staff and others on that.

And let's see other areas would be -- well, basically, just providing the proof of ongoing BMP maintenance too. The documentation, we feel, should be minimized because we do have a lot of documentation that we have to do anyway at the restaurants.

I'd like to close by saying that we have always made ourselves available and will continue to to the staff and working with them closely and helping develop BMPs that will work and can work in quick-service restaurants.

Thank you very much.

MR. NAHAI: Questions of Mr. Kissel?

Thank you.

MR. KISSEL: Okay. Thank you.

MR. NAHAI: Mr. Marvin Sachse.

Do we have a Marvin in here?

UNIDENTIFIED SPEAKER: Oh, he had to leave.

MR. NAHAI: Jacqueline Lambrichts, please. It's not written? You don't want to say anything?

MS. LAMBRICHTS: No.

MR. NAHAI: Well, that -- are you sure you don't want to say anything?

MS. LAMBRICHTS: Actually, my executive director should come and speak and tell you all about our adventures.

MR. NAHAI: Shall we wait for your executive director?

MS. LAMBRICHTS: No.

R0071766

MR. NAHAI: All right. Well, that ends cards. Do we have any questions of staff? Dr. Coe.

MR. COE: If I understand the staff recommendation, as in the agenda here, plus the recommendations of Heal the Bay, is that what you were saying?

MR. SWAMIKANNU: Yes. The Heal the Bay letter has a list of best management practices.

MR. COE: The letter of April 9 attached to it. You would adopt this in its entirety?

MR. SWAMIKANNU: The BMPs. But not -- the Heal the Bay letter has two components: The first component is a request for the Board to direct staff to analyze this whole BMPs in a very detailed context as they apply to situations, to set standards in fact for the BMPs themselves.

Second component is that the master list submitted to us by the permittees needs to be expanded, and those are the list of BMPs that we see at the tail end of the letter.

What staff is recommending is that we add those BMPs. We have looked at those BMPs; they're reasonable.

MR. COE: Item No. 4 of the letter.

MR. SWAMIKANNU: Yes.

And we add them to the master list. And that's the recommendation.

MR. COE: Thank you.

MR. NAHAI: I had one question: I'd like you to address Mr. Fleischli's comment, which is that -- I mean, as I understand it, it doesn't matter how many BMPs you add to this thing or who suggested them. Because if the language of your resolution reads that the permittees shall consider these BMPs, does that mean that anybody can consider and reject?

Are we really asking people to do any more than look at the BMPs that are being suggested?

MR. SWAMIKANNU: Let me address that question in two parts. The first part is: There are millions of BMPs out there. We have a California handbook that was put out by the municipalities. There has been no official recognition that those BMPs are actually sanctioned by any board or by a state agency for implementation to control storm water.

So what we have here is we have narrowed those BMPs that are applicable to the situation in the Los Angeles region. And so you have a well-defined list of BMPs that ought to be

considered.

Now, the second issue is: In a particular situation, let's say the BMPs for restaurants might be different than the BMPs for a mall with a large parking structure. And so that's a different situation, and we would like that addressed when the plans for a restaurant or the plans for a large parking lot are brought for consideration.

And so the answer to that is, yes, we have narrowed -- now, we have an officially -- we will have an officially sanctioned menu or list of BMPs for the permittees to consider and for the public to look at.

Now, whether that applies to the situation of a restaurant is the next level of resolution, and that's not before you for consideration today. And what Mr. Fleischli would like, would like that level of detail to be considered by you at this time.

MR. NAHAI: So, then, your response to that is that that level of detail will be considered at sometime, just not yet.

MR. SWAMIKANNU: Yes.

MR. NAHAI: And that when it will be considered in the future, that at that time it will

receive a force and a backing and language that will be a lot stronger than let's consider --

MR. SWAMIKANNU: Yes. I think Mr. Fleischli's issue also is the fact that that level of detail will never come up to you for consideration. It's considered only by the executive officer. That was a conscious decision we made when the permit was adopted, just for processing and saving time.

MR. NAHAI: Thank you. That's clarified.

MS. LYON: But the Board could, at its discretion, pick that up and decide it among itself?

MR. SWAMIKANNU: I'll let Jorge answer that question.

MR. LEON: You know, everybody has a law degree, but I have to take it anyway, huh?

No, you wouldn't be able to do it without amending the permit because the permit is written so that the discretion is given to the executive officer.

It's kind of an interesting question. Just -- and the only analysis I've given it is interpreting the permit. But there's got to be a discretionary call that the Board can always make on

any kind of delegation. So I suppose we could do a quick and dirty sort of a resolution that pulls that specific item back without opening up the whole permit.

MS. LYON: I imagine we could make a recommendation to the executive director.

MR. LEON: Yeah.

MR. DICKERSON: And I think I was going to probably duplicate the comment, and that is, as part of your resolution and motion to direct staff to incorporate additional detail as noted by the Heal the Bay, we would be happy to do that at a future time. If you wanted to give us a time frame even, let's say a year, to do that, that'd be great.

MR. COE: I have the same question that Mr. Nahai came up with. On this resolution -- and this is what we're asked to act on, I guess.

It said that these programs must include -- must include best management practices. But in the action or active part of the resolution, under "Therefore be it resolved," it says, "permittees shall consider the BMPs," which means they can consider them and say, well, they're no good. You know, I won't do anything.

Can we tighten that language up a

little bit to say that they "shall implement BMPs from the approved list, see Exhibit B" or something?

MR. DICKERSON: Well, on No. 3, under "Whereas," perhaps we could say the following: "Unless the BMPs have been evaluated and are considered appropriate practices for utilization by permittees in the development of their respective programs and activity." And then an additional language --

MR. COE: Just refer to that list.

MR. DICKERSON: I'm sorry?

MR. COE: "They shall." "Shall select." The action part of this is the resolve. I think that's a follow-up --

MR. NAHAI: Absolutely. If I understand you correctly, you're saying that it's okay for the permittee to be allowed to select from the various alternative BMPs, but the language, as we have it right now, would give them the option of considering and rejecting it.

MR. DICKERSON: I think it should be selecting part. Where would that go exactly? Do you have a --

MR. COE: Number 2.

MR. NAHAI: Number 2, yes.

MR. DICKERSON: Of the "Whereas"?

MR. NAHAI: No. No.

MR. DICKERSON: Right where I wrote it in.

MR. COE: "The permittee shall implement BMPs from the approved list. See Exhibit A," or something like that.

MR. FLEISCHLI: Mr. Chair, can I respond briefly? I don't believe you closed the poll and maybe you'll let me address that.

So they have to implement something from the list, something from the list. So they choose we're going to sweep. I mean, when you choose language like that, that's the type of scenario you're getting into. They'll choose one BMP on the list and say, okay. I swept my lot, and therefore I've complied with this new resolution.

If you want to amend the resolution, the language should be addressing the maximum extent practicable language and the pollution reduction language along the lines of things like, "any net increase in pollution loading above predevelopment levels is prohibited. In addition, new developments shall achieve pollution reductions to the maximum extent practical." And then maybe you say,

"Utilizing the BMPs and things like that.

And then to go even further, some language that Mark and I discussed, for example, would be, "In approving any new development project, the County in each municipality shall assure that all new developments in the county shall be required to include design practices and storm water treatment controls that will prevent any untreated discharge of storm water from paved areas and parking garages."

And maybe that's farther than you want to go today, but I think the language that's being discussed right now sets a dangerous precedent in terms of completely ignoring what the whole point of this really is. And it's not to have someone just choose one thing from a list be it sweeping or whatever, but it's the link to the water quality goals. And that's why I think it's important that, if the Board is willing to consider this other mitigation plan, that we try to link them together at some point in the future.

MR. NAHAI: When you use the phrase, "to the maximum extent practical" --

MR. FLEISCHLI: Right.

MR. NAHAI: Because I'm looking at a revised resolution that was submitted by the -- by

the City, and it suggests language like, "taking into account cost effectiveness, ease of maintenance, consistency with other environmental mandates, you know, and stuff to that effect.

When you talk about maximum extent practicable, would you count the cost effectiveness of the measure somehow in that?

MR. FLEISCHLI: Well, I think when we -- I think -- that's such a difficult question to answer, and I apologize that I'm standing up here stumbling a little. Because the Clean Water Act clearly provides economics to be considered in certain instances, and that's certainly clear.

And what we want to do is, you know -- I think we're willing to provide some flexibility in terms of what they're willing to do, but it still has to be to the maximum extent practicable. So for one particular facility, $1,000 might kill, you know, some of these guys we saw this morning. And other people, you know, $100,000 is going to be a drop in the bucket for them. And given the level of pollution that's running off the site, I think that's important.

MR. COE: Don't we have Chevrolets on the list in addition to Cadillacs? I mean, can't

they --

MR. FLEISCHLI: I think they can, and I think the appropriate -- I think -- there can be things on the list like that, and there certainly are. And the language that we're proposing in terms of, for example, the paved areas, that they implement that no discharge go untreated when it runs off the site.

We're not saying you have to do the Rolls Royce if in fact you can meet water quality goals without doing the Rolls Royce. We're not mandating that they choose the most expensive one. We're mandating that they treat it somehow, and then we look at the water quality standards, we look at the goals we're trying to achieve, and then we play with it from there.

That's the approach we've always taken, for example, with the auto wrecking facilities. There's a suite of things they can do, and that's sort of an iterative process, and if they don't get there, to the water quality goals, then they do a little bit more.

MR. NAHAI: So if one were to add language to the effect that "to the maximum extent practicable in the light of all surrounding

circumstances including economic considerations"?

MR. COE: As determined by the executive --

MR. FLEISCHLI: I would say maximum extent practical consistent with the requirements of Clean Water Act so that we don't get into debates about where the economics come into play, where they don't.

I think the dischargers try to make economics come into play at every single step of the process, and there are certainly certain steps in the process that are supposed to be purely scientific. And there are other steps in the process where economics are allowed to be considered. And so I would be more comfortable with language like that.

But I still don't -- I mean, I'm not going to sign onto a resolution to that effect without some linkage with why we're doing this for pacific -- specific activities. Excuse me. I'm going to blame it on my cold.

MR. NAHAI: You're doing very well with your cold.

Well, let's hear staff's response to Mr. Fleischli's comments, and let's see if we can move this forward to a resolution.

MR. SWAMIKANNU: I don't necessarily agree with the line of presentation that Mr. Fleischli has taken, but the permit says the best management practices has to come before the Board for consideration, and that's what we are doing today.

The issue of maximum extent practicable is a statutory standard for compliance in the municipal storm water program. That is the standard with which the permit is written and that standard stays for reducing pollution storm water, irrespective of the BMP list that you approved today.

So whether we should put in EMB here should not really be the issue because that is the statutory standard under which compliance will be measured.

Now, the way you do that is, for example, you have a document of plan for restaurants. And in that context you can go to the level of detail where you define the suite of BMPs, and the standard that you set for measuring the broader MEB standard in the act.

But to put MEB here would confuse the issue. It's not "implement to the maximum extent practicable"; it's "reduce pollution to the maximum extent practicable." And the list of BMPs here are

for an entity to select from this suite so that they can demonstrate that they have reduced or they have attempted to reduced pollutants to the maximum extent practicable, not implement a particular BMP to the maximum extent practicable because that does nothing for water quality.

MR. NAHAI: What about Mr. Fleischli's suggestion that we add basically a "whereas" that says that the reason that these BMPs are being adopted is in order to reduce pollutions in the maximum extent practical.

MR. SWAMIKANNU: That's a restatement of -- I don't necessarily disagree, but it's true whether it's in this resolution or not. So --

MR. NAHAI: I think he feels about it that it would provide some context to the resolution.

MR. SWAMIKANNU: And that's the privilege the Board has.

MR. DICKERSON: I would also note that the language that the City offered on cost effectiveness is really a replication of language on cost effectiveness that is already in the permit as well.

Perhaps one advancement on this would be on the resolution No. 2, "The permittees shall

select," perhaps the most effective of the BMPs to utilize those as opposed to others that would be less effective that might be of some language that would be helpful.

MR. COE: The definition and the decision on what's most effective to them or you or --

MR. DICKERSON: Well, ultimately, it would be their choice except for the fact that they are under an obligation to ensure they reduce pollution to the maximum extent practicable. If we find that ABMP has not been selected, which is meeting that standard, we would say, "We haven't gone far enough. We need to do more."

MR. COE: Or it can be stated as a goal under the whereases or something.

MR. DICKERSON: So we're certainly open to language that would add that.

MR. NAHAI: Well, let me make a motion to strike to get this moving then. I would move that we adopt the resolution with the two broad changes: One is to add a section to the whereases stating the purpose for which the resolution is being adopted and the BMP's being adopted.

And secondly, to change the language of

paragraph 2 of the resolution to read that the permittees shall, instead of "consider these, " it would read, "shall select and implement the most effective BMPs from the BMPs approved and attached hereto."

I mean I'm not married to that language.

MR. COE: That gets to what we're talking about, I think.

MR. DICKERSON: And we'll probably need a No. 3, which talks about directing us to incorporate additional detail, what Heal the Bay asked us to do.

MR. NAHAI: Yes.

MR. DICKERSON: And we're happy to do.

MS. DIAMOND: Would that be the selection of No. 4, or would there be more included as well?

MR. DICKERSON: I think it might be better as No. 3, but I'm not sure.

MR. NAHAI: You're saying you would attach an Attachment 3.

MR. DICKERSON: Yes.

MS. DIAMOND: I was referring to the letter from Heal the Bay, No. 4, where they would add

those additional BMPs.

MR. NAHAI: Yeah. They're going to do that but the issue is how to incorporate it. And we could have a new paragraph 1C that would read, "Attachment 3." And in it -- and Attachment 3 would then consist of the section -- the BMPs listed in Section 4, is it, of the Heal the Bay letter?

Now, if we need to add something for the flexibility of updating BMPs in the future, then --

MR. DICKERSON: I would request that we do because otherwise we have to bring it back to the Board for formal approval.

MR. NAHAI: And how would that language be?

MR. DICKERSON: That would be a No. 3, I think, under "Therefore, be it resolved," authorizing the executive officer to modify this list to incorporate additional detail as deemed necessary.

MR. NAHAI: That's fine with me.

MR. GALE: Okay. That's the language as we're looking for it. Our concern would have been that if we decided this is the list that you select and implement from, that we would be limiting technology unless there's some means of updating this

BMP list because there are many new ideas coming out every day that we deal with. So --

MR. NAHAI: Just by standing at the podium you communicated your thoughts to us.

Do we need to read through that resolution again?

MR. DICKERSON: I think I have it down unless you want you to go through it.

MR. NAHAI: Dr. Coe, would you like it read back?

MR. COE: Yes.

MR. DICKERSON: Okay. In the first whereas, we're adding a No. 4 where we would state the purpose of why this resolution's necessary and why BMPs are necessary. And the language for that is, I think, a little open right now. If you'll allow us to fill that in.

MR. COE: Is that the part about achieving maximum --

MR. DICKERSON: Yes.

And then in "Therefore be it resolved," we would have 1C that we would add with Attachment 3, and that would refer to the BMPs from Section 4 of the Heal the Bay letter. And that would be an additional attachment, that list of BMPs.

Number 2 would be modified to state, "The permittees shall select and implement the most effective BMPs from the BMPs approved and established hereto." The remainder of that would be stricken.

MR. NAHAI: "Approved and attached hereto."

MR. DICKERSON: "Approved and attached," yes.

MR. NAHAI: "Attached hereto." And then in order to deal with the next section, I think you should add a parenthesis that would say, "as may hereafter be updated," "as same may hereafter be updated" so that we're not tied into exactly these and we provide a little flexibility.

MR. DICKERSON: And then the remainder of No. 2 would be stricken; correct?

MR. NAHAI: No. Why?

MR. DICKERSON: All right. Keep that in there.

Then No. 3 under the, "Therefore be it resolved," would be to authorize the executive officer to incorporate additional detail to the BMPs as necessary.

MR. NAHAI: Okay. That's the motion. Do we have a second?

MR. COE: The detail -- Dennis, the detail includes some of the things that Heal the Bay were talking about conceptually, but reorganization --

MR. DICKERSON: Yes. The reformatting. And we will take a look at that, and if it works, we'll certainly do it.

MR. SWAMIKANNU: I would add -- you have requested that we add Section 12 from the Heal the Bay letter, BMPs. And the letter from the Western States Petroleum Association, which is the association for gas stations, they had included a list of BMPs as well which went through a state process of consensus. And I don't know if you have that before you. I would like that considered as well as part of their attachment.

MS. NAHAI: Was that in our package? I don't remember seeing it.

MR. SWAMIKANNU: Thought it was in the package. I'm sorry.

MR. COE: It's not in their letter of April 9?

MR. SWAMIKANNU: I think it was attached to the letter. The City of Los Angeles also brought that up.

MR. COE: The letter's at the end of the best management practices, just before -- near the end.

Oh, it's 16-136.

MR. DICKERSON: It's this additional material that was provided?

MR. COE: No. This was in the original --

MR. SWAMIKANNU: What was sent to you was a fax. That's what happened. It did not come with the fax. The original of that letter has that attached, and I must apologize.

MR. NAHAI: I'm sorry. I don't appear to have it in my package or in my supplemental materials so --

MR. DICKERSON: We'll have to pass on that.

If it's necessary, we can certainly bring that back for approval at a later date.

MR. NAHAI: Is that covered under the last paragraph that we've given you about adding more detail?

MR. DICKERSON: Fine. Yes. We'll look out at that one.

MS. LYON: I mean, I would hate to

ignore it since it went through the consensus process at a state organization.

MR. DICKERSON: Sounds good.

MR. NAHAI: Could we have a second?

MS. LYON: Second.

MR. NAHAI: All in favor say aye.

UNIDENTIFIED SPEAKERS: Aye.

MR. NAHAI: Motion carries.

MR. KESTON: I just want the record to note that I abstain from voting on this matter.

MR. NAHAI: Moving on to Agenda No. 17, HR Textron, Inc., Santa Clarita. This is the adoption of a resolution approving a negative debt and to adopt WDRs.

MR. NAHAI: Is this a public hearing? Do we need to administer the oath?

MR. LEON: You don't have to, but it is an action item. I don't anticipate any comments or -- but no.

MR. NAHAI: I don't have any cards on it so --

MR. DICKERSON: Mr. Chairman, I -- if there are no cards or speakers, I would certainly like to give the Board the opportunity to move by consent on this item, if there's no objection.

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SUSMP's

VICE CHAIRMAN KESTON: Motion and second?

CHAIRMAN NAHAI: So we're deferring it to the October 28th meeting?

MR. LEON: Merely continuing.

CHAIRMAN NAHAI: Motion. Do we have a second?

BOARD MEMBER LYON: Second.

CHAIRMAN NAHAI: Any discussion? Hearing none, all in favor?

BOARD MEMBER DIAMOND: Opposed.

CHAIRMAN NAHAI: We have one opposition from Ms. Diamond.

All right. We're going to move on to Item Number 14, which is the report on the Executive Officer's intent to approve the standard urban storm water mitigation plans. And perhaps introductory remarks from Mr. Dickerson.

MR. DICKERSON: Thank you, Mr. Chairman and Members of the Board.

In 1996, this Board adopted a permit for the control of storm water pollution in the greater Los Angeles Region. That permit, the Los Angeles Municipal Storm Water Permit, implements federal law that requires municipalities to address the increasingly serious problem of storm water pollution.

The implementing features of this permit require that model programs be developed to address specific categorical sources of storm water pollution, among them construction sites, municipal facilities and new developments. Within the model program that is called "development planning" are various provisions that address the need to improve our urban environment so there is simply less storm water runoff that has not first been subject to an intervention to remove a portion of the pollutant loading carried by that storm water runoff.

These provisions are called Best Management Practices or BMPs, and they are essentially simple techniques to allow for the retention for a short time of runoff, allowing the removal of some of the pollutants carried within runoff, and ultimately rendering runoff less harmful to our water ways. In April, you approved a list of these for use in address thing problem.

Another element required by the municipal permit is what is called a Standard Urban Storm Water Mitigation Plan or, excuse the acronym, "SUSMP." SUSMPs are more specific storm water management plans for specified categories of development, as Dr. Swamikannu will explain to you shortly.

These plans have been submitted to the Regional Board, and under the terms of the municipal storm

water permit, I am charged with the responsibility of approving these SUSMPs. At our April Board meeting when the BMPs were considered, you had expressed an interest in having discussed before the Board whether the SUSMPs are ready for approval. In response, I added this item to the agenda in keeping with your direction. So, pending my approval, our set of SUSMPs that were submitted by the permittees and additional provisions relating to the American standards for BMP application that Dr. Swamikannu will explain in greater detail.

As you have seen, there is no small amount of interest in the additional provision that has been proposed. And as you will recall, this is the very same issue that was so controversial with the approval of the Long Beach Storm Water Permit.

Given the scope of interest and the nature of the comment that's we have received, it very well may be appropriate for additional time to be given to further develop the basis on which the American standards should be justified. I am open to that approach. This would mean that I am moving forward with approving the consensus submittal made by the permittees while reserving the opportunity to further modify the SUSMPs with respect to the American standard at a and later date.

As we move to Board discussion, I would

very much like your thoughts on that possibility. And I should note parenthetically that I'm hopeful that today's discussion on this matter will provide a factual basis and help illuminate this issue in greater detail at the current time.

So with that introduction I would like to ask Dr. Swamikannu to make the staff presentation.

DR. SWAMIKANNU: Mr. Chairman and Members of the Board, I will report to you on staff recommendation on the Standard Urban Storm Water Mitigation Plans. We have provided you with all comment letters that arrived until yesterday, as well as we've given you some background material. Some went with the agenda that was provided to you, "X" agenda.

Some background on the storm water permit, the Clean Water Act amendments of 1987 required that municipalities address storm water pollution. On that basis, this Regional Board issued the first storm water permit to Los Angeles County and Cities in 1990. We reissued the municipal permit in 1996, and more recently in June, we adopted a separate storm water permit for the City of Long Beach.

The compliance standard provided in the statute for the storm water program, or for the municipal storm water program, is the statutory standard of reducing

pollutants to the maximum extent practicable, commonly known as the MEP standard. In addition, the USEPA General Counsel has ruled that storm water discharges must retain water quality standards as well.

In the program requirement for the storm water permit, we have several elements. One of them is a requirement to address storm water pollution during the development planning stage, and as part of that, we had required that a development planning model be prepared for L.A. County and Cities. Within the model itself are several elements -- one, system for designating project as priority for planning purposes. There is also a master list of Best Management Practices that you have already approved. Next, the point of today's discussion, standard urban storm water mitigation plans which have to be approved by the Executive Officer. The models also include guidelines on storm water for CEQA documents and also includes an information program for developers and builders.

So what is a standard urban storm water mitigation plan? It might be defined as a model guidance document for the selection of post-construction BMPs. That's BMPs after the appropriate land use is being implemented or is being conducted. The purpose of the Standard Urban Storm Water Mitigation Plans is to ensure

that potential adverse water quality impacts are addressed during the project planning stage. That is the most efficient stage for putting in BMPs because once construction is complete, any retrofit is going to be expensive.

The manner in which we achieve this objective is to require that municipalities affirmatively review and approve a written plan that is put together by the developers or builders.

A couple of recent Board actions that impinge on the Storm Water Urban Mitigation Plan, the Executive Officer has addressed that, but I'll briefly go over it as well. You approved the Best Management Practices list for municipalities in April and you stated specifically to select from and require implementation.

In addition, when we adopted the separate storm water permit for the City of Long Beach, you prospectively applied the Standard Urban Storm Water Mitigation Plan requirements approved for L.A. County to the Long Beach permit.

These Standard Urban Storm Water Mitigation Plans were submitted to the Executive Officer for approval in July. They were revised to clarify the intent of a numerical measure. They were submitted to us as a consensus document. Basically they had gone through

public review conducted by the County, and they were also reviewed by the Cities, and the appropriate comments were addressed at that level before they were submitted to us.

The Standard Urban Storm Water Mitigation Plans have been developed for seven categories -- home subdivisions, commercial developments, gas stations, restaurant, automotive repair, single family, hillside dwellings. The positive features of the submittal to us require flow management where erosion may occur. They provide guidance on structural and source control Best Management Practices for developers and builders, and it lists treatment control Best Management Practices for home subdivisions and commercial development. By the term "treatment," I mean any (inaudible) that utilize physical or chemical processes for pollutant (inaudible), and these might be filtration settling as options.

The deficiencies, according to staff, that the requirement to consider treatment of BMPs is limited to subdivisions and commercial development. They're not required for gas stations, restaurants, single-family home dwellings and such. Similarly, a numerical mitigation measure for Best Management Practices is not included in the submittal to us.

Staff recommendation number one -- require consideration of treatment control Best Management

Practices for all seven categories; approve for Los Angeles County a numerical mitigation measure that requires application of treatment Best Management Practices to the 85th and lower percentile runoff events based on the American Society of Civil Engineers' water and (inaudible) method of calculation -- these are two national preeminent organizations for Civil Engineers as well as water (inaudible) -- or require application of BMPs to an equivalent rainfall criteria for Los Angeles County of all events up to and including the first three quarters of an inch of rainfall.

Recommendation number three -- many of the commenters had proposed alternative language for certain sections, and staff recommendation is that we review the language that has been provided to us by the commenters, and where they add clarity or otherwise improve the understanding and readability of these documents, we should make those changes.

So how is this criteria applied? How do we see it being applied? The developer will first select source control and structural control Best Management Practices from the guidance document, and these could be like trash containers. Also, select a set of treatment control Best Management Practices from the guide to effect pollutants in the total runoff from the first three

quarters of an inch. Note at this point that we have neither prescribed the Best Management Practice or Practices that should be adopted or the efficiency of the BMPs that they should be adopted.

The developer would then size these Best Management Practices to address the first three quarters of an inch. The plan would then be submitted to the municipality for approval. For example, what are the kinds of BMPs one might consider? One might consider swales to address the three quarters of an inch, for example along parkways and consider infiltration basins at the end of the swale, biofilters around the parking lot, green belt between rear yards of the homes, a detention basin serving as a lake, and some catch basin inserts to address oil, grease and perhaps trash.

Nowhere am I indicating that these are the only BMPs, and nowhere am I showing a preference for one or the other. Recall that these BMPs have been approved by the Board. You took that action in April.

Now I should try to summarize some of the comments that have been submitted to us on key issues.

The first, that we provided inadequate public notice. We provide 30-day notice where none is required, since there was no formal action being taken by the Board on this issue today. We mailed notices to all

interested parties on file. Some of them claim that they did not receive copies of the notice, which we had no way of verifying. We also noticed and conducted a technical workshop on August 10th, prior to the hearing notice, to inform and educate all interested parties on this issue.

Some of the commenters had raised the issue that the three quarters of an inch rainfall criteria is inappropriate. Staff contends that the three quarters of an inch is technically defensible. In addition, we have provided an alternative sizing criteria based on the nationally accepted model which looks at runoff, and you're really trying to control runoff and not rainfall.

The range of criteria or the criteria that we're proposing is well within the range of criteria being used by other communities around the country. The range is from half an inch to two inches -- Austin in Texas, Orlando, Florida; Washington, Maryland; Denver, Colorado.

The numerical criteria is also being used by some communities in the Los Angeles region. For example, Santa Monica has a criteria; City of Calabasas has one; Ventura County has criteria for its program; and three quarters of an inch is being used or being applied in the unincorporated area of Los Angeles County. And three quarters of an inch standard is average for local communities.

What does three quarters of an inch translate? It translates to the fact that over the long-term if you look at the rainfall and took rainfall measurements, 85 percent of the rainfall events would be treated by this BMP. And the 85 percentile can also be justified on the fact that if you increase the number or the amount of rainfall that you want to treat, you really don't get that much additional percentage of overall event. It's a cost efficient point. And as I mentioned before, the criterion is an average for local communities.

Now for the runoff model that I will briefly go over. This is the model that has been included with the manual of practice. It was done through more than five, six years of research, and the formula basically says that once you decide the amount of runoff you want to capture, there are several coefficients. For example, if you want to maximize the volume, the first coefficient to be concerned about is how much of the runoff do you want to treat, what percentage; and then the kind of area the BMPs are going to be in, whether it's a highly built-out area or it's a more developing area. And that means some storm precipitation volumes, which again are regionally specific. Based on that for the range in coastal California, the 85 percent annual runoff treatment is .12 inches to .86 inches, not determined by whether

you're well built-out or you're a new community.

This graph I would like to explain to you a little bit. On the vertical axis you have the volume of runoff. On the horizontal axis you have the rainfall depth, the number of inches. If you look at the amount of volume that has been generated by the different depths of rainfall. The graph indicates that the highest volumes are associated with the smallest amount of rainfall, and so three quarters of an inch is right in there.

What this criteria then does is promote Best Management Practices applications to smaller, more frequent. And if you look at pollutant loads, we are all concerned about the total maximum daily loads at this time. And this is actually data for Ballona Creek in a storm that happened in March 1998.

On the vertical axis, you have total copper, the loading. Horizontal axis, you have time, time of flow in the creek. If you look at the graph, three quarters of an inch or one inch would only address the rising portion. By this, what I'm trying to demonstrate is this is just a starting point. We are not trying to solve the total copper pollutant load issue. It's just a starting point, and that's what the criterion does at this point.

Some of the commenters had indicated that

perhaps this criterion would force the use of ineffective Best Management Practices. The effectiveness of any one Best Management Practice is totally distinct from the mitigation measures. The mitigation measures are broad standards for sizing. Recall also that the Regional Board resolution requires implementation of the most effective Best Management Practices. Effectiveness always is dependent on the proper application of the Best Management Practices.

And for those that are concerned there is not enough information out there on the effectiveness of Best Management Practices for development and planning, the USEPA went through considerable effort and put that in a database. This database is currently available online and on CD and it's constantly updated.

Some in the building community expressed a concern that the numerical measure mandates the capture of storm water. I wish to clarify that the intent of the measure is that a certain set of treatment Best Management Practices be applied to a definite quantity of rainfall or runoff. Storm water capture is itself only one type of application of a treatment Best Management Practice whose use may not be appropriate where space is limited. We recognize that. We will offer modifying language to clarify this intent.

Some municipalities expressed a concern that Best Management Practices maintenance would be costly, bun the maintenance of BMPs is essential, and maintenance depends on the type of BMP as well as cost depends on the type of BMP. The next is a recent journal article brought to our attention. It says, "When Best Management Practices become Worst Management Practices." The article itself was focussed on inappropriate Best Management Practices during construction, but this particular phrase holds true for BMPs when they are not properly maintained.

To summarize the numerical criteria and what does it do, it's a starting point to remove pollutants of concern in storm water. I discussed the example of copper before. A definite criterion facilitates Best Management Practice sizing and design. Pollutant load is reduced, and pollutant concentrations associated with the early peaks and early runoff events, called the first flush, is reduced as well. And ultimately the BMP effectiveness will determine actual removal.

Some commenters expressed a concern that no economic analysis had been done before we proposed this mitigation measure. I submit that none is required when implementing a federal regulation. But even so, when we

compared this numerical criterion to other storm water standards that had been in use for the last 50 years, it's reasonable.

For example, if you look at the next chart, you have vertical bars, axis, you have gradient going from 0 to 6. The highest bar is for flood control. That's a hundred-year design standard. That's the level of cost it might take for a comparable BMP. Suppose you were addressing feed lot operations. There's a requirement that you contain a 25-year storm. That bar represents that criteria.

The next threshold is for sediment removal. If you design sediment basins, you use 10-year standard. And the second bar from the left represents an equivalent criteria used in the State of Washington. And the reason it's so much higher than the criterion we're proposing is because the State of Washington is in a wetter climate regime, and given the fact we have fewer storms, we have a lower threshold.

Some commenters from the environmental community, as well as one city, expressed the concern that by limiting the Standard Urban Storm Water Mitigation Plans to seven categories, that we were being overly restrictive. I would submit that for phase one industrial facilities, these are facilities required to have separate

permits for industrial storm water. These are not listed as priority categories that we have in the permit issue. Also, commercial and state and federal facilities are not listed as priority categories in these permits as well.

On the issue of ecologically sensitive areas, the requirements in the Standard Urban Storm Water Mitigation Plan for ecologically sensitive areas, that requirement occurs or exists in the permit for the City of Long Beach. It does not exist in the permit for Los Angeles County and Cities. And so we would visit that issue when we discuss the reissuance of the permit for Los Angeles County and Cities.

One comment from the environmental community was that the antidegradation policy prohibits new development of any kind. We would say that storm water permits are a means of attaining that total maximum daily loads for impaired waters, and NPDES permits authorize conditions on new development but do not require prohibition on new development.

So I will conclude with the question, why now? Why are we proposing a mitigation measure at this point in time? And there are a few reasons.

The first, nearly a decade has gone by since we issued the Storm Water Program and we have gone far enough to look at treatment issues. There is intense

public and media awareness on the issue of storm water requirements and storm water problems as a whole. Seas of articles in local newspapers recently discussed the public perception, as well as a perception perhaps Southern California is behind the rest of the country.

The science has definitely progressed. Five years ago I could not have proposed a nationally (inaudible) number to you. Now the science is there and the basis seems reasonable. In addition, a numerical mitigation measure adds specifically and aids in Best Management Practice sizing and design. It also gives effect to the Best Management Practices list that you adopted in April, and permit frankly requires implementation now. There's an absolute deadline of July 30th, 1999 in the Los Angeles permit, and we've gone past that point.

That concludes my presentation. Jorge will address a couple of legal issues, questions that came up in the comment letters.

Thank you.

CHAIRMAN NAHAI: Thank you.

Any questions of Dr. Swamikannu?

Thank you very much.

DR. SWAMIKANNU: Thank you.

MR. LEON: Mr. Chairman and Board Members,

thank you. The comments that I have are fairly brief.

One of the comments that came up had to do with authority of the Board staff to propose the program that is before you. Basically the concern is that the Regional Board doesn't have the authority to make an interpretation that the Clean Water Act gives us the right to come up with numerical mandates in the remainder of the program. But in fact, the Clean Water Act is very broad, as we've discovered during our review of the permit that was issued to the County and as was tested to some extent.

Of course you recognize that the Long Beach mitigation was settled, but that of course wasn't one of the issues that was raised. There we argued in response to the litigation that the Board actually has the authority to require controls to reduce the discharge of pollutants and such other provisions as it determines appropriate. That's language directly out of 33 USC 342 PB iii. And in addition to that, there is an EPA interim permitting policy that authorizes more specific conditions or limitations to be incorporated into storm water permits as necessary and appropriate, and that statement can be found at 61 Federal Register 43761.

In addition to those specific regulations or -- I'm sorry -- statutes and interpretations, there's numerous court decisions that hold that administrative

agencies are entitled to discretion to a wide latitude in their interpretations of their own regulations and the laws that they implement. One such case is Chevron versus NRDC, 1984, 467 US at page 837.

It's my belief that the Board is on solid ground in considering and approving the program that is recommended by the staff.

Really quickly now, there was another comment that we also had to deal with in the Long Beach litigation, and that is by adopting the program that's before you, that the Board is creating another unfunded mandate. However, we, I think, prevail there have been cases that determine that the unfunded mandates provision that otherwise requires the states provide funding, doesn't apply to permits that are issued by the Board when it is imposing federal requirements. And it's also true that the Board is exempt from having to deal with the unfunded mandate provision where the statute implemented is a federal law and regulation and results in (inaudible).

CHAIRMAN NAHAI: Thank you. Well, with that we can move on to hearing from the audience. I have here 20 or 25 cards. We do have a three-minute limitation, and I would request that speakers strictly adhere to that time limitation. 22 cards actually.

And let's -- if I don't read your handwriting too terribly well, please forgive me. The first one I have is from a Mr. Gail or Ms. Gail from the home building industry. Going once, twice.

The second one I have is from Mr. Stan Thalenberg.

MR. WATSON: Excuse me. May we trade order in there? I had turned in my card early. Maybe it's now on the bottom of the stack, but I would like to speak first from the building industry, if I may.

CHAIRMAN NAHAI: Sure. What's your name?

MR. WATSON: My name is Richard Watson.

CHAIRMAN NAHAI: Okay.

MR. WATSON: I'm a member of the Building Industry Association of Southern California, and I've been involved in storm water quality issues since about 1990, also a member of the Executive Committee Storm Water Quality Task Force and Ventura's TMDO Water Shed Management Committee, also a member of CDIA's Water Resources Committee. I am now a consultant, but before that I spent 15 years with a major developer and builder in southern California and gained quite a bit of experience in this area.

My comments are based on a SUSMPs and the proposed changes. One of the reasons for that is I was

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one of those people who did not receive the notice, although my name is on the list to be notified. I was faxed a copy last week after BIA received a copy of the notice from the Regional Board.

There are several letters I think that have been sent into Dennis Dickerson within the last couple of days which were not in the packet that came out to you. Dennis Dickerson said they may have been added subsequently, but there are several letters that you should have from various members of the association.

I'm here today to both support and question. I support the adoption of the mitigation plans as guides to municipalities in implementing their regional or area wide permit. There are words like "every" and "all" that bother me quite a bit, and the area of source control seems to have been left out. Overall, they appear to be workable.

The major problem is the staff proposal to add numerical mitigation measures. As you know, that's why most of us are here today. I won't go through the quote of that and save a little bit of time. The environmental community basically got the County to agree to a set of numerical mitigation language terms, I guess I would say, under duress of litigation. Now what they want is for this Board, through its Executive Officer, to

impose those same or modified standards on the cities through the process of approving the SUSMPs.

As far as I know, most of the real parties of interest were not at the table during these negotiations. Other municipalities weren't there, the developers and the other business interests who were the target of this process were not there. The members of the Building Industry Association are willing to do our fair share, but we don't want to be looked upon as the low hanging fruit. We want equitable treatment based on good sites. We expect pro rata expenditures based on pro rata contribution of pollutants of concern. We don't want to waste money attacking the wrong problems with the wrong tools. Just because we got caught up in it, we have to do something.

As you know, housing addresses a major social need in the region, providing accommodation for here, and the imposition of new cost in regulations will increase the cost of housing and make it less affordable. Tradeoffs have to be concerned, and I think the unintended consequences of regulations must be evaluated. We don't really know what the cost nor the benefits of the proposed regulations will be. And we're not sure the staff does either.

I agree with what the Executive Advisory

Committee said about imposition of this without sound information being before public policy. It's not clear how the proposal is really going to help maintain or improve beneficial uses, and I have a written statement and I'll elaborate on that a little bit more.

CHAIRMAN NAHAI: Mr. Watson, I have to stop you there. Forgive me.

MR. WATSON: I would like to conclude with a request for 30 seconds. I would like to request the Board support the Executive Officer's idea of deferring the numerical mitigations, and I would further like to request that he convene a working group to thoroughly review these proposals and that be composed of people from the municipalities, the development community, the environmental community, vector control people, all sorts of interested parties, so that we could come to agreement on this.

Thank you.

CHAIRMAN NAHAI: Do we need to take a break? Five minutes.

(Brief recess taken)

CHAIRMAN NAHAI: The next speaker card that I have is Rose Collins.

Ms. Rose Collins.

MS. COLLINS: Good afternoon, Chairman and

Board Members. I'm Rose Collins with the City of Long Beach. The City of Long Beach is in agreement with cities such as Los Angeles, those represented by San Gabriel and Gateway City Cox, as well as the Executive Advisory Committee and with the County Board of Supervisors. All these agencies oppose a setting of a .75 runoff limit for a variety of reasons that differ from city to city as each of us have unique environmental charges and concerns.

As you know, we worked why partnership with the Regional Board staff and the environmental groups in developing the language for our permit issued June 30th of this year. Many positive innovative storm water programs are part of that permit. I won't enumerate all of them. I'm sure everybody's familiar with them. In fact, some cities opposed them, but I think they're pretty good. All are known to improve storm water quality.

The only issue unresolved was the SUSMP issue, as the impacts of a.75-inch mitigation standard were and still are unknown for our area. We have concerns with that issue as outlined in our letter to Dennis Dickerson. I would like to present that letter and request that it be entered as part of the public record. Tom, could you please bring that up for me?

Rather than speak on each item, as some are similar for all of the cities, I would like to highlight

the ones that are most of concern to our City. Site-specific scientific studies are needed to determine the long-range impacts of the .75 runoff mitigation on water tables, soils, and other environmental impacts. Specifically, Long Beach has sandy soil. How will mitigation through filtration affect groundwater contamination in Long Beach? Long Beach obtains 50 percent of its drinking water from groundwater wells annually. This is a big concern to us as in the summertime, our reliance on groundwater is 90 percent.

How will infiltration affect liquifaction and building codes requiring buildings to be earthquake safe? How will the .75 retention really affect the receiving waters and the beneficial uses in L.A. County?

During our permit negotiations, we asked for time to study and determine the answers to some of these, what we think to be, reasonable questions. Unfortunately, we reached an impasse and hope through this process that these studies will be conducted.

If this standard is proven without causing other environmental problems such as groundwater contamination, then we will be willing to adhere to this standard. Although we have limited data on other parts of the nation in a meeting by the Regional Board staff on August 10th of this year, we have no concrete, local L.A.

County data that supports the implementation of that standard.

We believe in and fully support scientifically based clean water programs and storm water pollutant reduction based on programs that result in real water quality improvements without significant unnecessarily expenditures. I would like to read an excerpt from the County Board of Supervisors letter which pretty much sums up our request for SUSMP implementation. In that letter, last paragraph says, "Although many cities share the same storm water quality issues, their approach to solving problems varies based on a wide range of issues within each city. Therefore, we support the City's approach to implementing the SUSMPs, thus allowing flexibility for each city to determine what is responsible, practical, within its own jurisdiction." Excuse me the words "reasonable" and "practical" within their own jurisdiction.

CHAIRMAN NAHAI: Can I stop you there, please.

MS. COLLINS: Yes.

CHAIRMAN NAHAI: Thank you.

MS. COLLINS: If I might say one last thing.

CHAIRMAN NAHAI: If everybody has one last

thing to say, we'll never get through this. Really, please.

MS. COLLINS: Thank you.

CHAIRMAN NAHAI: I hate to interrupt people. It's not in my nature. So when you force me to do that --

MS. COLLINS: Thank you.

CHAIRMAN NAHAI: Thank you so much.

The next speaker is Mr. Rufus Young from Burke, Williams. Going once, twice.

MR. YOUNG: I'm coming.

CHAIRMAN NAHAI: Okay.

MR. YOUNG: When your name is "Young," you get accustomed to sitting in the back of the room.

My name is Rufus C. Young, Junior. I'm a partner with the law firm of Burke, Williams and Sorenson. We are proud to represent a number of cities as City Attorney, among them the City of Alhambra, on whose behalf I appear here today to address and strongly support Recommendation Number 3, which is to review the comments and to consider adoption of some of those comments and rewording.

I invite your attention to the SUSMPs. In the background section of each one of them, there is a description of what they're about and how they do it. If

I may quote from the third full paragraph under "background," "Discretionary projects as defined by CEQA that fall into one of the seven categories will need to implement the appropriate SUSMP requirements." Turning to the section under "requirements" in the respective SUSMPs, you find in each case a requirement to provide storm drain systems stenciling and signage. That's all well and good, but the question is just where and by whom.

The first bullet under each of those is to provide all storm drain inlets and catch basins must be stenciled with prohibitive language and/or graphical icons to discourage illegal dumping. That's a fine requirement in concept, but is this to be done by each new gas station, each new automotive repair shop, each new restaurant. And for which storm drain inlets -- the ones on the premises of the new gas station, the ones into which storm water from the new gas station might flow, all of them in the city, all of them between the city and the ocean?

A similar issue I would raise with respect to the requirement for signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks. Again, the issue is by whom, which creeks, upstream as well as down stream, down stream all the way to the ocean?

Cerritos area without paying for potentially unnecessarily structural controls that make part of the property undevelopable."

Number two, "The groundwater table in Cerritos is very high. Potential basins or swales have the potential for causing pollutants and contaminate the groundwater.

And the third, "Cerritos prides itself on the clean and attractive appearance of our city. However, we do not have the staff experience or budget to support the maintenance required with the structural controls that have been suggested for use in complying with these imposed numerical limits."

"Cerritos supports a study of the effectiveness of these controls, as well as a plan to monitor the pollutants found in our storm water in our city. Unless the effectiveness and economic viability of this proposal can be demonstrated, Cerritos will oppose the blanket requirement for all cities in Los Angeles County to retain and treat .75 inches of storm water during a 24-hour event."

And I do have a copy of this letter that I can submit for the public record.

Thank you.

CHAIRMAN NAHAI: Thank you very much. Next

Ms. Terri Grant.

MS. GRANT: Good afternoon. My name is Terri Grant. I'm speaking as Vice Chair of the Executive Advisory Committee of the Los Angeles County Municipal Storm Water Permit. I'm speaking on behalf of Desi Alvarez, the Chair, who had to leave for a meeting and on behalf of the EAC itself.

The EAC is a committee comprised of various permittees from each of the six water sheds. The committee meets monthly to discuss broad issues that impact all the permittees. The EAC contends the permittees did its job as called for and in compliance with the permit by developing the program that was submitted to the Regional Board for approval, or the Executive Officer for approval.

The program was developed through a committee of permittees and consultants. It was submitted for extensive review and comment where permittees and interested parties were allowed to provide input. The EAC contends that when a program is submitted to the Executive Officer under the permit, the Executive Officer has the option to accept or reject the program, and that unilateral changes should not be made after the program is submitted.

The EAC is opposed to the inclusion of the

numerical standard in the Standard Urban Storm Water Mitigation Plans for four primary reasons.

There's insufficient information about the levels of relevant pollutants in the receiving waters to justify and require the expensive treatment control BMPs. There's insufficient storm water monitoring data available to demonstrate that the types of activities regulated by the SUSMPs are actually causing negative impact to the receiving waters. Applying numerical standards to the approved treatment control BMPs constitutes a requirement without in-depth analysis of its costs and implications.

And fourth, a set of numerical standards which may be applicable for certain developments in one area may not be applicable for similar developments in another area.

The EAC feels the imposition of numerical limits and costs that will result from these limits without supporting information is poor public policy. The Regional Board, County, and eighty-four cities that are party to the permit exist to serve the health, safety and well being of the public. We need to work together to gather and analyze the information that is needed to implement efficient and cost effective programs to improve water quality on their behalf. The EAC submitted a letter to this effect to Dennis Dickerson.

That concludes my testimony.

CHAIRMAN NAHAI: Thank you very much.

Mr. Abasadi, please.

MR. GONZALES: Good afternoon. I'm Nasa Gonzales representing the City of Azusa.

We are opposed to the numerical limits for two main reasons. There is really no hard data behind those limits, and we've talked about cost benefits. We feel that the cost benefit study needs to be done to support such drastic requirements.

Finally, since Counties of Orange and Riverside do have not to contend with these limits, we feel that these numeric limits will (inaudible) an inherent regional inequity to Southern California.

Thank you.

CHAIRMAN NAHAI: Thank you very much. Mr. Scott Pomeron.

MR. POMERON: Good afternoon, Chairman and Members of the Board. I'm Scott Pomeron with the City of Lakewood and the Chairman of the San Gabriel Valley River Water Shed.

I would like to submit a resolution that the Council of Lakewood adopted Tuesday night for the record. I would also like to read a letter on behalf of the Water Shed. On behalf of the majority of the 29

cities that comprise the San Gabriel River Water Shed Committee, I would like to express opposition to the incorporation of numeric mitigation measures into the Standard Urban Storm Water Mitigation Plans.

Although many cities have expressed individual opposition through letters and resolutions, the members of the San Gabriel River Water Shed Committee, a recognized body under the current NPDES permit, collectively oppose the proposed numeric mitigation measures.

For the sake of brevity, I will not restate the numerous reasons for this opposition, but rather reiterate the need for more studies and research before such mandates are imposed on local governments.

In light of the fact the Executive Officer is under pressure to approve the SUSMPs, and given the concern raised by many local officials, officials entrusted with protecting the economic health of the jurisdictions they represent, the San Gabriel Valley River Water Shed Committee supports the approval of the SUSMPs as originally submitted by Los Angeles County without the problematic numeric measures.

On behalf of the Water Shed, I would like to thank the Regional Board and staff for their hard work and willingness to understand how and why local

governments are very concerned with imposing such mandates, mandates that are not based on regional specific studies and not justified by any cost benefit analysis.

Thank you.

CHAIRMAN NAHAI: Thank you very much.

The next four names would be Mr. Dean Paradise, Mr. Jay Michael -- and I cannot read the last name but representing the City of Diamond Bar, Mayor Dee Hardison from the City of Torrance, and Mr. Ron Wilkins.

Mr. Paradise.

Mr. Stan Thalenberg, I did call your name out, you know. You decided you did not want to speak at that time.

MR. THALENBERG: I got bumped. I'm with the Los Angeles County Sanitation District, and I've just been asked to say a few words about storm water discharges to the sanitary sewer.

The Sanitation District's wastewater ordinance prohibits discharging storm water into the sanitary sewer and there's a simple reason for that. The system wasn't designed to be able to handle those flows. In those specific cases where storm water needs to be discharged in the sanitary sewer, these need to be evaluated on a case-by-case basis, and I want to emphasize they also need to be approved in writing by the Sanitation

District. That's about it.

Thank you.

CHAIRMAN NAHAI: Thank you very much. Mr. Dean Paradise.

Mr. Jay Michael from the City of Diamond Bar.

MR. HOLTZ: Thank you very much. Jay Michael Holtz, and I am representing the City of Diamond Bar, and we are in opposition to the numerical standards as documented in the letter that was provided by staff.

I did want to make five additional points. First of all, economic analysis may not be required, but we would like to know where does it state in the regulations that it cannot be done in the interest of economic justice for our less affluent communities within southern California.

The research that was identified today in the staff presentation, we feel this should have been shared with the regulated communities before today. We feel that we should avoid knee jerk reactions to media publicity, but I think that was something else that was identified in the presentation, that lately have focussed on storm water as a source of viruses and other types of offensive material.

The City wholeheartedly supports the SUSMPs

as submitted, not as advised. We feel that there is definitely a need to conduct some additional research into this, and we feel as a city that your Executive Director's direction that you provide additional time to study this matter, that would be supported.

Thank you very much.

CHAIRMAN NAHAI: Thank you. Mayor Dee Hardison.

MS. HARDISON: I'm Dee Hardison. I'm the Mayor of the City of Torrance. I'm also the immediate past Chair of the South Bay Cities Councils of Governments, and I'm representing that organization today.

I had the privilege to appear before the Board some three years ago when you also adopted the storm water permit, and I have to say this is a much nicer room than the other one, and we spent many more hours there, as I remember.

You know, we came a long way. As I know, many of us cities were very -- South Bay Cities represents 15 cities in the South Bay area. We were very disappointed. We thought we got something kind of shoved upon us. But we went back and we became the cities, the part of those committees, those Water Shed Committees, and we worked over the past two, nearly three, years to make this work for you, make this work for the cities. And

we've come a long way.

I think we would be taking a definite step backwards if something that had been agreed upon without the numerical standard was then adopted. Then we're stepping backwards. We've got to continue to work together as cities here in Los Angeles County to solve water problems.

So from the South Bay Cities' perspective, we would ask you not to include at this point the numerical standards -- and the numerical standard. And again, whether it takes another group, additional time, whatever as was suggested by the Director, let's continue to work and come to consensus together so that we solve that problem.

Thank you so much.

CHAIRMAN NAHAI: Thank you.

Mr. Ron Wilkins.

MR. WILKINS: Good afternoon, Mr. Chairman and Members of the Board. My name is Ron Wilkins. I'm with the Western States Petroleum Association, with the Trade Association for the Oil Industry in the Western United States.

When I appeared before your Board in August on the City of Long Beach permit, I told that you we had participated in the development of a storm water BMP guide

for retail gasoline outlets. This was published in 1997 by the California Storm Water Quality Task Force and we incorporated those requirements into the permit.

We're now faced with another and substantially different set of proposed storm water requirements. Regretfully, in this case, industry has been effectively been precluded from participating.

It seems to be the assertion that these SUSMPs are necessary to carry out the objectives of the Clean Water Act. Background discussion of the SUSMP for RGOs -- again, Retail Gasoline Outlets -- states the two primary objectives of the Clean Water Act is to reduce discharge pollutants to the maximum extent practical. MEP means, and I quote, "To the maximum extent possible taking into account equitable considerations of synergistic added to the competing factors of but not limited to the gravity of the problem, physical feasibility, public health risks, societal concerns, and social benefits." The proposed SUSMP, particularly the numerical limit, has failed to address these criteria.

First, the gravity of the problem -- there has been no data that runoff from a well-maintained service station is resulting in the impairment of the beneficial use of any body of water.

With respect to physical feasibility, there

has, in my view, been a lack of any specificity regarding the types of improvements that would be necessary to comply with these requirements. Thus, there's been no assessment of cost, and consequently there's been no assessment at all regarding the physical feasibility.

With respect to public health risks and the like, I have heard two ideas as to what a service station might do to comply with these requirements, both of them highly, highly inadvisable. One is the use of porous pavement, grassy swales and the like. The other might be installation of an underground tank or sump.

Retail Gasoline Outlets go to great lengths to protect the subsurface environment, and even more, it might be necessary. The general philosophy is to eliminate pathways for contaminants to enter the soil. One example is the use of impervious pavement, in direct opposition to the conventional wisdom of the use of porous pavement, grassy swales and the like purposefully create direct pathways for pollutants to enter the subsurface environment.

Apparently another possibility is the use of an underground tank. Several problems associated with this, not the least of which is the public safety concern of having a large tank full of air with the possibility of a small amount of gasoline vapor.

Further, there are questions about applicability of UST requirements, double containment monitoring, and so forth, and questions about how to handle the rain water that might be collected in such a tank.

Mr. Chairman and Members of the Board, I respectfully submit that this set of proposals has major shortcomings, and I think that this needs to be brought back before your Board. I would be happy to participate in a discussion effort, and I should note for the record that I was also one of the parties that did not receive notification of this hearing.

CHAIRMAN NAHAI: Thank you very much.

MR. WILKINS: I do have a copy of my testimony, which I can leave with the clerk if you so desire.

CHAIRMAN NAHAI: Thank you.

The next four names are Mr. Rick Sausay, Mr. Gary D. Moore, Mr. Marvin Saxy and Mr. Ray Pearl.

MR. SAUSAY: Thank you, Mr. Chairman, Members of the Board. When I see myself up there, I want to -- I get this uncontrollable urge to say, "Hi, mom." My name --

(Laughter)

CHAIRMAN NAHAI: You could give yourself an

autograph or something.

(Laughter)

MR. SAUSAY: My name is Rick Sausay. I am a Staff Engineer of the Main San Gabriel Basin Water Master. Our agency is a court-appointed agency responsible for the quantity and quality of the groundwater in the Main San Gabriel Basin. Our basin provides 80 to 90 percent of the water supply for over a million people in San Gabriel Valley.

I'm here today representing Water Master because we are concerned about SUSMP and some of the concepts in there. We were not notified of this -- or were not aware of this plan being implemented until just last Monday, and so we're not real familiar with what's going on. But one of our big concerns is that the retention of storm water on an individual site, because what we fear is there will be unintended sequences.

As the low flows come down and you put in porous pavement, you put in leech fields, these various trenches, it will bring in contaminants into these trenches because of the low flows, and your subsequent large storms will come and they could possibly drive those pollutants into the groundwater. So we're very concerned about that.

Another thing is that it could be easily

like MTBE, there was a request to clear up the air quality, and then the unintended consequence was that we have contamination by MTBE, not in San Gabriel, but we know it's in Santa Monica. So we don't want this kind of thing to recur.

We're concerned also that engineers at the cities and whoever is going to implement this might just go through that recipe of Best Management Practice and say, "Okay. This one is acceptable." Well, we don't know the identification of the contaminants and the fate of those contaminants. Some contaminants are not that important to us. Some are very important to us. We would rather see the contaminants go in the streets and go down the storm drain and let the County get caught.

(Laughter)

MR. SAUSAY: What we don't want -- what we don't want is that water, that contaminant, to go into the ground, get into our water supply, and we find it in our drinking water well. That is our big concern.

So when I heard the BIA guy talking up here, he's listing all these people, and yet he did not mention the water supplier. They are the ones that are going to be impacted. And we had not been a part of the committees, we had not -- maybe we were invited, but it was not made clear to us the impacts of this thing.

And hopefully you will not tell my mother what I've said today.

(Laughter)

MR. SAUSAY: Thank you, Mr. Chairman and Members of the Board.

CHAIRMAN NAHAI: Thank you.

Mr. Gary D. Moore.

MR. MOORE: Gary Moore with the City of Los Angeles. I want to thank the Board for taking the time to hear this very important subject. As you're aware, the City is a leader in the fight against storm water pollution. This fiscal year, the City is spending over $20 million on this fight. The City has gone beyond the permit minimums and is spending over $4 million on pollution abatement capital projects.

The City supports storm water pollution reduction programs. We are mindful that such programs need to be cost efficient and result in real water quality benefits.

Simply, we cannot accept the SUSMPs as proposed nor the staff recommendations here today. I would like to point out a couple of reasons why. And Mr. Chairman, if you could give me a 30-second notice so I can stay in the three minutes, I would appreciate it.

Section 2(i)(i).a.1 of the permit specifies

that permittees develop guidance to be used when evaluating a permitting priority and exempt projects. The permit -- and I emphasize -- does not specify which projects, which BMPs are mandated for each of the projects, but states rather that the SUSMPs must incorporate the appropriate elements of the recommended BMPs. Therefore, the mandatory language that's presented in the SUSMPs goes well beyond the requirements of the permit, and as such, should not be imposed on the development project.

The establishment of a numerical limit as proposed by staff is equivalent to establishing effluent guidelines that USEPA is presently undertaking. Such a process requires the limit to be technically and economically feasible and justified based on adequate and appropriate data and subject to public review and comment. It's premature for the Los Angeles region to move forward with numerical design criteria without adequate technical and economic information to ensure informed database decision making.

What we would recommend is instead that -- instead of being labeled requirements, BMPs contained in the SUSMPs be set forth as guidance for permittees. Secondly, in determining design criteria, it should remain a local agency responsibility which is established during

the land development process based on site-specific conditions and water quality consideration and not a requirement established by the Board.

CHAIRMAN NAHAI: 30 seconds.

MR. MOORE: Okay. The City, in revising the discussion in the proof of the BMP maintenance in the current Section 8, to remove the specificity on how to prove maintenance is to be obtained and simply referred to the need of the permittee to ensure maintenance through its only legal authorities.

We've submitted two letters, August 26th and September 2nd, and we have extra copies here we'll give to the clerk. We look forward to working as part of a committee to help better write SUSMPs that I think we can all support and will help reduce storm water pollution.

Thank you very much.

CHAIRMAN NAHAI: Thank you.

VICE CHAIRMAN KESTON: Mr. Chairman, can I make a comment? Quick one. I would like to compliment the City of Los Angeles, and in particular their letter of September the 2nd from Edith Wilson. I think we received a tremendous number of letters, and this one was detailed and specific. It contained some revisions and suggestions for the Standard Urban Water Mitigation Plan for the

10-plus unit subdivision. I think they really spent a lot of time and effort putting this together, and I would like to compliment you on it because I think it's very well thought out.

MR. MOORE: Thank you very much.

CHAIRMAN NAHAI: Mr. Marvin Saxy.

MR. SAXY: Mr. Chairman, Board Members, thank you for your time. My name is Marvin Saxy. I'm a State Licensed Engineer. I have a Master's Degree in Environmental and Industrial Engineering. I am representing ADASAC, Southern California Automotive Recyclers and Baker Automotive Dismantling Recycling Associations serving over 300 Southern California recyclers in this Water Shed.

As a group we wish to place before the Board our concerns over treatment control BMPs. The SUSMPs for Retail Gasoline Outlets and auto repair shops do not mention treatment methodologies, but emphasize Best Management Practices, BMPs, for pollution prevention. From a technical perspective, we consider treatment to be an ineffective methodology for managing storm water runoff.

The Clean Water Act and General Industrial Water Permit emphasizes two elements in storm water management programs. The first is the elimination of

contamination through pollution prevention measures. The second is cost effectiveness of Best Management Practices. Neither of which is treatment. State Water Board benchmarks for water quality standards have been obtained in vast numbers of auto recycling sampling over the last few years except for zinc. Zinc is in the background and we have to address that issue separately.

Treatment control is typically associated with media filters. The Crash Industry submitted a September 9th letter to the Executive Officer describing why media filtration is technically not feasible. Sufficient time does not exist to review this document, but media filtration is not designed to remove metal ions, oil and grease, alterconductivity, change PH or remove nonsettlable solids.

Media filters with the capacity to treat .75 inches of water running off of a one-acre site will require a storage volume of over 20,000 gallons and take ten hours to treat the storm water. This is not economically feasible for most small to midsize businesses. Moreover, we have seen no evidence to indicate that storm water runoff from Retail Gasoline Outlets and auto repair facilities actually require treatment and is a concern of ADASAC and VADRA that all pollution prevention measures that have been implemented

in its present auto recycling facilities will be dispensed with in favor of treatment.

As previously stated, we feel treatment will represent an extreme expense, not improve the quality of storm water runoff, creating a permitting and regulatory nightmare for all small to midsize businesses, with little improvement to the environment and little chance of lowering risk to the human health.

Thank you for your time.

CHAIRMAN NAHAI: Thank you very much.

Mr. Ray Pearl.

MR. PEARL: Good afternoon, Chairman and Members of the Board. My name is Ray Pearl. I'm Deputy Director of Government Affairs for the Los Angeles-Ventura Building Industry Association.

I would first like to thank Richard Watson for his testimony earlier. Our chapter supports every single word that he said. Secondly, I would like to thank the numerous members of the building community who are in the audience -- builders, developers, and engineers, as well as the 20 or so that could not make it today but sent letters within the last couple of days to Mr. Dickerson.

I am here representing those companies and another 350 companies that represent our association. We, along with the other groups you've heard from today, are

opposed to the numerical mitigation measures.

I didn't realize today that we were going to do all opposed and all for this, so I'm sure that Heal The Bay and NRDC and others haven't disappeared on us. So I hope that when you consider the testimony you've heard today, that you will consider it in its entirety and not just the last word you've heard.

Mr. Dickerson started off by asking for a discussion today of sound science, and I think what you've heard so far -- and I don't think my mind will be changed in the next half hour -- we simply aren't there yet. The cost is unknown. There's no detailed analysis, and as the City of Diamond Bar stated, no, it's not a requirement, but why not. The cost is going to be significant, and we hope that that will be taken into consideration.

.75, contrary to the letter that NRDC wrote, it was a negotiated settlement with the County of Los Angeles. There was a number presented by the County, a number presented by NRDC, and they met somewhere in the middle. This was stated at the workshop in August.

Another issue was maintenance after installation, how is it going to be maintained, who is going to be maintaining it, the cost of that maintenance. These are all questions that have yet to have been answered.

It is difficult for me to assess all the ramifications of this because everything at this point is so vague. In the letter that Heal The Bay submitted to you, one of the things they mentioned was being careful about existing habitat when implementing BMPs. We would like you to not forget existing human habitat. In these type of discussions, that is so often forgotten.

We, the builders, live in Southern California. We call this home. We drink the water. We swim in the oceans as well. It's important that we be reasonable and cost effective without ignoring the water quality.

There simply is not enough information for you, Mr. Dickerson, to act. And I hope the Board will reaffirm that. I like the way you started off by saying we would approve the SUSMPs and talk about numerical mitigation at another time. I think that's eminently appropriate. Let's get answers to these questions. Let's sit down and have a discussion. Let's work together. Let's not do this backwards.

Thank you.

CHAIRMAN NAHAI: Thank you.

The next four speakers would be Mr. John Hunter, Mr. Enrique Jimenez, Mr. Ray Tahere, and Mr. Ted Morton.

Now, with respect to Mr. Tahere, he's representing more than one city here and I've agreed to provide him with a five-minute time.

So Mr. John Hunter, please.

MR. HUNTER: I'm John Hunter. I'm here representing the Los Angeles River Management Committee, a group that is comprised of about 38 cities, all draining to the Los Angeles River.

After extensive discussion and review, the committee has voted to oppose the inclusion of any numerical standards in the SUSMPs. This opposition is based on several factors -- a lack of information regarding the concentration of pollutants in the receiving waters, the monitoring data that has been collected to date does not satisfactorily demonstrate that the types of activities the numerical limits have been developed for are actually going to be of benefit to the environment, the oils and greases has not been -- I guess let me back up just one moment.

The BMPs that are -- I'm going to have do compose myself here. The numerical limits that are being imposed have not been demonstrated that they will have a positive impact on reducing the pollutants of concern. I know the words "we don't know" if a vegetative swale will reduce oil and grease to a satisfactory level. In fact,

we don't even know what that satisfactory level is going to be.

In the absence of this kind of technical data, we just don't feel that the expense of installing BMPs to meet numerical limits is going to be justified. In addition, the SUSMP, as submitted by the co-permittees, we have not been notified by the Board that they are insufficient. And as far as we know, the Board has not made a determination that the SUSMPs without the numerical limits are indeed sufficient. And we wonder, does the Board or Board staff have the authority to impose these limits.

The limits should not be imposed without expensive co-permittee involvement. We've spent probably two years, maybe more, developing the model programs with the SUSMPs, and to relatively suddenly be faced with numerical limits, we don't feel is proper. The co-permittees need a considerable amount of more time to work with this so that we can indeed see that these will work.

We do not want to impose any requirements on developers or developments unless we really know that these are going to work.

With that, I'll thank you very much.

CHAIRMAN NAHAI: Thank you.

Mr. Enrique Jimenez.

Mr. Ray Tahere.

MR. TAHERE: Mr. Chairman, Board Members, staff, good afternoon. To begin with, I would like to introduce into the public record the following cities that have written letters opposing inclusion of numerical limits into the SUSMPs. They include the cities of Whittier, San Gabriel, Montebello and Lomita. These and other cities are opposed to numerical limits for a number of reasons.

First of all, bringing in imposed numerical limits would require infiltration-type pollution controls such as porous pavement, infiltration basins, infiltration trenches and other controls that remove pollutants by discharging them into the ground. As noted in a USEPA guidance document, which I would also like to enter into the public record as part of this testimony, it says as follows: "Infiltration systems may not be appropriate where groundwater requires protection. Restrictions may also apply to infiltration systems located above sole-source drinking water aquifers. Where such designs are selected, they should be incorporated with a recognition that periodic maintenance is necessary for these areas. Long-term effectiveness in most cases will depend on proper operation and maintenance of the entire

system," end of quote.

Although the development planning model program in the SUSMPs developed by the County of L.A. reference this infiltration-type controls, neither of these documents warns of their potential for groundwater contamination. I believe this is a concern shared not only by the Main San Gabriel Water Master, but the San Gabriel Basin Water Quality Authority as well, both of which are charged with water quality protection in the San Gabriel Basin.

Although other states have numeric limits, such as the 80 percent total suspended solids removal requirement, they are not inflexible as the numeric limits now being considered by the Regional Board staff. These states give municipalities the maximum extent practicable provision discretion to consider not only controls that pose other environmental problems, but are cost ineffective as well.

In contrast, the numeric limits that are being considered would hold cities feet to the fire in meeting them no matter what. In other words, the number becomes more important than the pollutant issue. Furthermore, if the numeric limits are adopted today, cities will be pushed into a mad rush to require developers to comply.

However, neither developers nor cities have experience in the proper design or maintenance of the treatment controls required to meet the proposed numerical limits. This could produce catastrophic results as experienced by a number of municipalities throughout the country.

In consideration of the foregoing, the following is proposed. Approve the SUSMPs absent numeric limits as recommended by the Executive Advisory Committee and the seven Water Shed Management Committees. The SUSMPs, by the way, include structural controls for subject new developments. Defer the issue of numeric limits for consideration during discussion of the next permit scheduled to take place a few months from now.

Direct staff to compound a committee to discuss numeric limits and other methods for controlling pollutants from new developments. The committee should be chaired by the Regional Board staff and represented by impacted stakeholders including members of the environmental community, cities, elected officials, building industry and water producers, and water quality management agencies. The purpose of this committee would provide the Regional Board with a set of options on how to control pollutant discharges from new developments in the most cost effective and sensible way possible.

Thank you very much for your time and patience.

CHAIRMAN NAHAI: Thank you, Mr. Tahere.

I've been told that six of the environmental groups that are here today have decided to pool their time and have four speakers represent them and take about five minutes each. But I'm not sure which are the environmental groups and who the four speakers are going to be. Could somebody enlighten me on that?

MR. BECKMAN: Mr. Chairman, David Beckman, Natural Resources Defense Council. We worked out with staff to have a joint presentation on behalf of NRDC, Heal The Bay, Santa Monica Baykeeper, American Oceans Campaign, Friends of the L.A. River. And one other stakeholder and myself, Alex Halprin, and Steve Fleischli are going to do one presentation which we prepared on Power Point for you.

CHAIRMAN NAHAI: So that means that we won't hear from Mr. Ted Morrison --

MR. BECKMAN: Right.

CHAIRMAN NAHAI: -- and we won't hear from Ms. Jacqueline Ambriz?

MR. BECKMAN: Correct.

CHAIRMAN NAHAI: And I have -- Mr. Beckman, before we do that, I have a card from Mr. Charles Gail --

MR. BECKMAN: Okay.

However, neither developers nor cities have experience in the proper design or maintenance of the treatment controls required to meet the proposed numerical limits. This could produce catastrophic results as experienced by a number of municipalities throughout the country.

In consideration of the foregoing, the following is proposed. Approve the SUSMPs absent numeric limits as recommended by the Executive Advisory Committee and the seven Water Shed Management Committees. The SUSMPs, by the way, include structural controls for subject new developments. Defer the issue of numeric limits for consideration during discussion of the next permit scheduled to take place a few months from now.

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water in a 24-hour rain event. I think that's very important to talk and look at the amount of water we're looking at capturing and treating.

I'm just going to leave the comments at that at this point. Thank you.

CHAIRMAN NAHAI: Thank you.

MR. GAIL: But in closing, I want to mention that the deal you're striking with the environmental group right now is not fair. Other people in this room, cities and our industry, could have asked for the same thing. We did not know that was negotiable at this time that we could pool our resources.

(Applause)

MR. GAIL: I wish for consideration, if we're going to do this in the future, that you set the rules prior to the hearing.

Thank you.

CHAIRMAN NAHAI: I'll tell what you we'll do so you don't feel that way. Once the presentations are over, if anybody feel that's there is a point that hasn't already been made that they want to make, I would be more than happy to hear from them. I think with respect to the Building Industry Association, Mr. Gail, I think you're now the third speaker to be speaking for that industry.

MR. GAIL: Mr. Chairman, with all due

respect, you cut off our first speaker of our association this morning, a gentleman that has given his time and effort on this issue for our industry and our members. You cut him off.

Thank you.

CHAIRMAN NAHAI: I think it's been fair for everybody. Thank you.

Mr. Beckman.

MR. BECKMAN: Good afternoon, Mr. Chairman. I'll attempt first just to respond to what we've heard because it's so totally outrageous and disappointing. It seems like a lot of the cities have no understanding of the Clean Water Act, no understanding of the studies that have been done around the country for ten years, no understanding of the proven treatment technologies that have recommended, and worse yet, no understanding of the SUSMP structure which allows them the discretion to pick and choose among BMPs so that the most effective from cost perspective and environmental perspective can be selected, and problems like infiltration where water tables are high, which is a problem, can be avoided.

It's a bunch of denying, deflecting, and defending storm water programs which have yet to do the trick and which have led to a really outrageous polluted

situation in Southern California.

Let me briefly tell you what we're going to tell you so that you can track it. I'm going to cover first why we need this standard, the severe storm water pollution problem that we have, and the role of new development and redevelopment in creating the problem. Then we're going to go into the discussion of the numeric standard, why it is consistent with what's being done around the country, it's nothing new, and how it is tailored by the foremost expert in the country on storm water to local conditions.

The next slide shows two other sections. First or second -- I guess it's third on there, we want to talk to you briefly about the legal foundation for this standard because we think it's well supported, and finally which want to suggest changes to make the standard stronger, to expand the scope, and also point out to you that this is a performance standard, this is not a quality-based effluent limit, and those may also be appropriate given the fact that nearly half of the water bodies in the L.A. region are listed as polluted on the State's 303(d) list.

Go to the next slide. The one after, actually. L.A. waters, Members of the Board, are extremely polluted. 50 percent, as I indicated earlier,

are listed on your own 303(d) list. That's not the environmental community's list, it's your own. That's half of the waters in the State of California that have been determined to be impaired are in Los Angeles, which is really incredible, if you think about it. The L.A. Times, as you know, did a story recently in which they pointed out that while the respected experts consider the receiving waters here to be in very troubled states and that storm water pollution is the leading cause.

Go to the next slide. That information is comes not again from the environmental community, but from SCCWR, which has reported recently that storm water pollution is the leading source of water pollution, not only across the state, but in Southern California. And storm water pollution for pollutants of concern has increased between 200 and 700 percent during the last two decades.

We also want to point out to you that it's not just our opinion, but the EPA said and was quoted in the Los Angeles Times story, pointing out that the L.A. region lacks behind virtually every place in the nation when it comes to reducing storm water pollution. This is all relevant to whether you should move forward with a standard that will help it.

Go to the next slide. Actually, I've

already covered that. The reason that this is such an efficient way to deal with the problem has to do with the role of new development and redevelopment creating the problem, and I would like to briefly go over that.

Storm water pollution, as many of you know, has two main causal components, volume and velocity. And those are related to concentration. Development contributes directly to both factors. That's essential to understand. And in particular, by creating impervious surface often where there was none before, development has dramatic effects on increasing the quantity and quality of storm water runoffs.

Now the next set of slides show you what this is about. If you compare first of all a one-inch rain storm on a natural meadow, you get about 200 cubic feet of runoff. If you compare that to a one-acre parking lot, you can see that there's 16 times the amount of runoff or 3400 cubic feet of runoff. That's a dramatic difference, and that's why this is such an efficient and effective way of getting at the problem as part of the suite of BMPs which we think are necessary. It's not the only one, but it's an important part of the mix.

Municipalities would essentially take back a useful tool out of the quiver and say let's do other things. Well, some of the other things haven't worked.

On a larger scale, that comparison that I just showed you, in terms of a 16 times increase in runoff is even greater.

And for example, when some studies were done of an Illinois water shed, it was determined that there was approximately 200 times more runoff when you compared pre- and post-development. That's water shed-wide. And the reason the numbers are different is because the implications are magnified, and take one and magnify if over the course of a water shed and you get a much worse problem even in that one-acre comparison.

The next section Alex Halprin is going to discuss, and he's also going to discuss Section 3, which is where we are talking about the legal basis for the standard.

So with that, I'll have Alex step up and he'll be followed by Mark Owen and Steve Fleischli.

MR. HALPRIN: Chairman and Members of the Board, I just want to talk briefly first about the need for this standard and then also talk about the incredible breadth of support that this standard has in other municipalities around the country, as well as the extensive scientific basis for the standard because there seems to be a lack of understanding of those issues.

First of all, the National Center for Water Shed Protection in Washington, D.C. conducted a four-year

study on waste reduced pollutant loads. The study was not targeted for development planning, but their conclusion was that a fundamentally different approach toward development was needed to (inaudible) protect (inaudible) and aquatic sources. In addition, the Urban Runoff Quality Management, which is a book that many people have cited here today. It's a very well respected kind of leading book on this topic, has stated that structural Best Management Practices for storm water quality enhancement is the cornerstone of storm water management in newly developed and redeveloped urban areas.

This is really the key method that we're going to be able to get at the pervasive problem of storm water pollution.

Storm water BMPs have been thoroughly tested. There have been dozens and dozens of studies all over the country that are determined to be highly effective. Common storm water treatment methods, such as you can see, extended detention ponds, oil separators, vegetative swales, some of these things are simple, cost effective practices. It's a simple matter to redirect gutters toward vegetated areas, infiltration practices, other media filters, can catch as much as 75 to 90 percent of solids and lead, copper and zinc reductions of half or more. Infiltration can stop the discharge 95 percent of

solids, metals and bacteria. That gives you an idea of how effective these practices are and how much they're needed.

I want to just mention some of the other areas around the country because there's the impression, I think, being created that the Board is being asked to do some so dramatic. In fact, many other cities and municipalities around the country are doing things much more aggressive than the compromise that's been submitted by the staff today. The State of Virginia has a zero additional pollution loading standard. Montgomery County, Maryland, one-inch storm. We're talking about a three-quarter-of-an-inch storm. Here in Los Angeles County, City of Santa Monica requires that a one-inch storm be captured, a one-inch storm in 24 hours for parking lots. And as you know, the County of Los Angeles itself has adopted a .75-inch standard and has adopted it for a much broader scope of projects that are in issue here. So the County's program itself is more aggressive.

The standard that's being proposed by staff today has been developed. It's not something that came out of the blue. It's not just a negotiated position or a halfway point between two positions that were staked out there.

There are several bases for the standard.

It did come out of a consent decree and the subsequent work between NRDC and Bay Keeper and Los Angeles County. It was the standard that was supported by two of the country's foremost storm water experts, one of which is Dr. Richard Horner, a national storm water expert. We submitted his CV with our papers. He's written over a hundred technical reports, studies and books on the issue of storm water control.

Also, it's my understanding that Dr. Michael Stenstrom from UCLA, who is the Chair of the Department of Civil and Environmental Engineering, also one of the other foremost experts on storm water control, supports the standard that the staff is recommending today.

We have independent experts from Camdress and McKee (phonetic) who came and spoke at the August 10th workshop, who stated that the alternative standard recommended by Dr. Swamikannu of the 85th percentile capture ratio issue was also an appropriate, legitimate standard. And imperical data from California's own BMP handbooks that we cited in our comment letter also support the 85th percentile or .75-inch mitigation standard.

So the idea that this is a number that has come out of the blue, that there haven't been any studies or any support for it is completely hellacious.

Just so that we're clear, it is true that it's not even the standard that's recommended by the experts at NRDC has consulted with. And finally, the proposed standard is less stringent than the standard adopted by the County, again, because the County's program is much broader.

I guess I want to make one more point before I get on to this third section here, which is what this standard is, because there seems again to be some confusion about what exactly it is that we're talking about here.

Several of the cities have stated concerns about what might be an appropriate BMP for a certain situation or have expressed some concern about dangers that might be imposed by certain Best Management Practices. Those things are not at issue here today. There is nothing in staff's proposal that in any way limits the discretion of the municipalities or the developers to choose the Best Management Practices that are best suited for an individual developing a site.

As Dr. Swamikannu stated, what's at issue here is a number for already approved BMPs, BMPs that this Board has already stated are appropriate, just so that it's clear how much -- what volume of water those BMPs have to treat. And again, that number was reported by

extensive studies and experts.

One other thing that I think was stated was that this was an effluent numerical limit. I don't know where that comes from. This is not a numerical limit of any sort. Again, it's just the volume that's going to be treated by BMPs that you've already approved.

Another concern was expressed by the City of Los Angeles and others, that there might not be sufficient legal authority for the Board to adopt this standard. So I want to talk just a minute about what the legal standard is.

First of all, the Clean Water Act itself and the federal EPA regulations specifically contemplate structural controls. The (inaudible) standard places the burden on the dischargers to implement BMPs unless they can show it unnecessary. This is the language from the Federal Court with jurisdiction over this area in a suit against CalTrans which is regulated by the same municipal storm water provisions of the Clean Water Act as are the municipalities at issue here today. And the Court's interpretation of the Clean Water Act was that the maximum extent practical standard, the discharger will partly have the burden of showing the maximum extent practicable standard has been met.

The other area that people have looked at

to try to convince the Board that the Board does not have authority to adopt this standard is the permit itself, so I just want to address the permit briefly.

First of all, the permit says that SUSMPs and guidelines for their preparation must be developed. That's a mandatory duty. Secondly, it says that at the minimum, the SUSMPs and guidelines shall be prepared for the following development categories, and it lists the seven that were in the County's proposal. So this is the very minimum set of -- types of development for which these programs are to be -- the SUSMPs are going to implemented and SUSMPs are to apply. And finally, it states that all permittees must implement a program for planning measures consistent with the SUSMPs.

So there is mandatory language with respect to these SUSMPs and the Board is perfectly justified in adopting this standard under the permit.

With that, I'm going to turn it over to Steve Fleischli to address the next topic.

MR. BECKMAN: What I would like to address first of all before I hand it back to Steve is basically that the staff's proposal would apply to a narrow set of projects, the seven that were stated earlier.

And one in particular is very disturbing to the environmental community is how there could have been

an omission of SUSMP for environmentally sensitive areas is just beyond us, to think that it's going to be acceptable to put developments right on top of environmentally sensitive areas. Everyone is familiar with the problems in the Santa Monica mountains and knows how totally out control that has been over the last decade or more. It's just absolutely reprehensible.

So clearly that needs to be added. It was added within the Long Beach permit. If you want consistency across the board, it needs to be added here as well, and we were very disappointed that that was not included within there. And also within the permit itself, it calls for permittees in their project characterization system to actually consider the location of a project with respect to designated ESAs. So for that not to be here is also inconsistent with the permit.

In addition, Heal The Bay and others who supported that have stated that on the hundred-foot buffer zone for development adjacent to an ESA is needed as well because of the problems that we've been talking about for and some of the many problems the Regional Board has talked about.

The County of Los Angeles, as was stated earlier by Alex, the standards apply to a wide variety of development projects. I'm not going to go into all of

them. Suffice to say the list is more than twice as long than what's on here right now. Most notable that's on the County list that's not on here are parking lots with 24 or more parking spaces. And we've all heard about parking lots and the contributions to metals pollution as well as PAH pollution, as well as ESAs. And so it's a much, much longer list with the County that's included right here.

So clearly what we're supporting in the staff recommendations is we want it to be much stronger than what is already on there right now.

With that, let me hand it over to Steve.

MR. FLEISCHLI: I just want to touch briefly on two issues with relation to water quality standards.

We've heard a lot today from the dischargers about L.A. County being under the duress of litigation and that's why they've come to the .75 standard. Quite frankly, it's been ten years that the environmental community has been under duress of foot dragging, avoidance, and in some instances incompetence by the dischargers. It's very frustrating and that's why we move forward with these lawsuits.

We even heard Alhambra today criticizing stenciling of storm drains. To me it's just absurd that we're having debates about that sort of thing. Heal The

Bay has done 70,000 storm drains. They can do it. The cities can do it. They have 18 people on staff for every single program they do.

I want to talk about where we really should be with all of this and to show you that the .75 is really a negotiated standard. The environmental community believes we should be a lot farther than that, but we were not able to achieve that in our litigation. And we believe that the .75 standard indicates reasonable further progress towards achieving our goals.

We do believe that water quality base standards would be appropriate in this instance. As was mentioned, this is an effluent. This is not an effluent limit. This is a technology-based limit that we're talking about today, .75 treatment. It's not water quality-based at all. It doesn't talk about issues like antidegradation, which for the last couple of months, I've been talking a lot about in front of you folks.

The EPA has recognized that storm drain runoff from point and non-point sources is not exempt from antidegradation sources requirements, and that would say that actions covered by -- they say that actions covered by antidegradation include the issuance of urban permits, urban runoff permits.

Under that provision, the municipalities,

the new development projects, may not add any new pollution unless they meet certain conditions, and where it's a 303(d) listed water body, they may not add any at all, no exception at all.

Xavier made the statement this morning on his slides -- excuse me, this afternoon -- that the environmental community said no new development where 303(d) listed water bodies occur. That's not what our position is. Our position is that you might not have additional pollution loading from new development. That's where we should be heading in the long-run. We should be adding language in that says storm water runoff from new development shall not increase pollution loading above predevelopment levels. That's where we're supposed to be heading.

.75 is less than that. It's a negotiated position and the municipalities seem to think that we're here today to say that .75 is a starting point. It's not a starting point. .75 is reasonable for the progress for today. We should be moving a lot further along.

With that, I'm going to turn it back over to Mark.

MR. OWEN: The environmental community has commented on all draft versions of the EAC model SUSMP. Needless to say, nearly all of our comments were ignored

in each of the drafts, and in fact, the drafts got weaker over time, even eliminating a rain event performance standard, which is what you're hearing everyone object to today. It was in a previous draft, I think two different versions.

Perhaps the EAC's efforts to avoid controlling runoff pollution are best exemplified by the language included in the model SUSMP, which I might add is still in the model before you today. Quote, "Should any conflict be discovered with the new guidelines and any preexisting regulation, the preexisting regulation shall prevail." The poisoned pill makes the SUSMPs meaningless by ensuring antiquated regulations that degrade the environment will prevail over new guidelines designed to protect the County's aquatic resources.

Please delete this offensive language. To date, the approved model programs have been late -- including this one -- short on details, impossible to enforce, and largely ineffectual except for the public education model program. We are done with the "fox guarding the chicken coop" approach to model program writing.

Six months ago, this Board approved a BMP list to abate runoff pollution from new and redevelopment. We brought up the need for numeric performance standards

to ensure the BMP would be implemented effectively. We were told the Board would address this at a later date.

Two months ago, we brought this issue again during the Long Beach storm water permit. At that time, the Board took extraordinary measure of deferring the new and redevelopment performance standard within that permit for today's discussion on the SUSMPs. Again, nothing was done during that day.

On Long Beach, just to let you know a side, we were shocked to see them testify because as part of our negotiation, they said they would not come back and testify in opposition to this particular thing, so we think that's actually a direct breach of faith.

The Board needs to make it clear that a numeric performance standard for new and redevelopment must be adopted to ensure the protection of aquatic resources. We're not talking about policy retrofits. We're talking about the most far-reaching, cost effective way to reduce storm water pollution today and in the future.

The current situation of unsafe beaches, toxic creeks and streams, contaminated sediment hot spots and beaches that look like landfills after every single rain is absolutely unacceptable. We strongly --

CHAIRMAN NAHAI: Can we stop?

MR. OWEN: Okay.

CHAIRMAN NAHAI: Thank you. Mr. Don May and Ms. Joan Greenwood.

MR. MAY: My name is Don May. I'm a resident of Lakewood and what the very first speaker referred to, I'm a real party of interest. One of those folks that's a swimmer and a fisherman on the water, one of the people that Clean Water Act talked about when they wanted to make the waters of the country fishable and swimable in ten years. That was 30 years ago.

Surely in ten years if we can put a man on the moon, we can make our waters fishable and swimable. We're still trying.

I wanted to talk to you because I received a letter from my city, Lakewood, that I am totally in disagreement with, with the exception of the part where it talks about how Long Beach basically showed the cities how it is, through a program of coercion and litigation, that they can defeat the efforts of this Board to bring about the changes required to enforce the Clean Water Act and make our waters fishable and swimable, particularly with ESAJs.

With Long Beach with the wetlands that are down there, they require particular protection, and I would point out that under the Bolsa Chica decision, Bolsa

Chica Land Trust versus Coastal Commission, ESAJs are protected. And we urge you to look at that decision and that language.

This region indeed is the worst in the nation. And one of the things that's happened as a result of that, not only is the efforts of Long Beach used around the country as a model in how to evade doing something about storm water runoff, but that has produced ever worsening positions.

My family -- my parents, my grandparents, and seven out of eight great grandparents met the protein needs of their families through fishing through the depression through the big war. In the '60s, we saw the fish disappearing because of storm water runoff. Saw several species of black croaker, one of the China croakers that was a mainstay, disappear. And the '70s, birds having problems. In the '80s epidemics among the seals and so forth. And now we find bacteria, intercoccus viruses.

The problem from storm water runoff, it's clearly linked back to human health and this interdiction, these BMPs, is how you solve the problem.

I'd like to change a hat. I'm also a medical device manufacturer. And those of you in business who think regulation is tough should try dealing with the

FDA. The cornerstone of making medical devices safe, cornerstone of regulation by the FDA is BMPs. And the two parts of BMPs that are most important and result in safe medical devices are monitoring and numerical limits. Without numerical limits, you can't have effective BMPs. And I would point out that my medical devices, which happen to be catheters, catheters have a better medical record in terms of getting people sick, infected and dying than our beaches do. And when it comes to a point that putting one of my devices in your chest during open heart surgery poses less of a risk than going for a swim in the ocean, I think it's time to look seriously at these BMPs and the pollutant situation.

Thank you.

CHAIRMAN NAHAI: Thank you.

Ms. Greenwood.

MS. GREENWOOD: My name is Joan Greenwood. I'm a resident of the City of Long Beach, California. I am the Environmental Chair for the Wrigley Association. The Wrigley District of Long Beach is an area between Pacific Coast Highway and the 405 freeway. Our western boundary is the Los Angeles River. We are extremely concerned about the issues that have been brought to the Board today.

The City of Long Beach, in preparing it's

new strategic plan for the first time appointed an environmental task force. Four members of that 18-person task force are residents of the Wrigley District. As part of our recommendations that we'll be going to the City Council within the next month or two, we have made a strong argument for adopting the type of BMPs that are under discussion today with numerical limits and full accounting for the impact of development on the taxpayer down the road.

We already have the commitment from one member of the City Council. To bring this issue back to our new City Council, not the one that was seated when the litigation was initiated years ago, but our newly comprised City Council, there will be workshops, there will be public hearings. And again, we felt this subject was far too complex to enter into it at the time the Long Beach Municipal permit was being discussed within the city to make a change. But we intend to raise the bar, and we will raise the bar so that the City of Long Beach, when it adopts a sustainable city program within the next quarter -- and we now have the support of the other four task force on this issue -- we will be raising the bar on the storm water permits for this city.

So I did want to let you know that the people who live in Long Beach, because with all our public

testimony on this issue, the open forums, not once have we had a resident object to anything that has been put forward by your staff in terms of BMPs.

Thank you.

CHAIRMAN NAHAI: Thank you, Ms. Greenwood.

I have a final card from Chris Bertelli representing the Building Industry Association.

MR. BERTELLI: Thank you, Mr. Chairman. Thank you, Board. Building Industry Association of Southern California does represent approximately 1800 members throughout Southern California, but I will not ask for three minutes for each one of them at this point in time.

(Laughter)

MR. BERTELLI: A lot of discussion up here has been about the numerical limitation standards, and the reason we are discussing and debating about them is because they are not required under any legislation or under regulatory requirement at this point.

Our friends in the environmental community made a very nice presentation, and it included several municipalities that already have numerical mitigation standards in practice, but from what we have been able to garner from the record currently compiled by staff and

compiled by the Board, there are no results and no costs, no result or cost analysis of any of those mitigation standards.

If they're already in place in other parts of the country, we should be able to quantify those costs and those benefits and the effectiveness of those programs before proceeding on a gigantic scale here in L.A. County.

If I may just say one more comment directed toward Mr. Dickerson. You have a responsibility that none of us here, I think, envy. There are very few individuals, I would say, either in the country or in the world who can with one decision impose millions upon millions upon millions of dollars of cost upon municipalities, upon builders, and upon landowners. So I would hope the Board at this time would direct Mr. Dickerson to postpone action on this item for today so that we may all be able to sit down together and discuss this issue.

Thank you.

CHAIRMAN NAHAI: Thank you. With that, we'll ask for a response from staff.

VICE CHAIRMAN KESTON: Mr. Chairman, can we ask any of the members who spoke some questions?

CHAIRMAN NAHAI: Of course we can. We first want to hear from our staff?

VICE CHAIRMAN KESTON: Whichever you --

CHAIRMAN NAHAI: Do you have comments to add or shall we go straight into asking questions?

MR. DICKERSON: I would prefer to go with the questions at this point.

VICE CHAIRMAN KESTON: Mr. Chairman, I have some questions, one for Mr. Gold and one for Mr. Beckman. And again, everybody here sounds like a participant at the debates and discussions on water going from the north to the south. There seems to be quite a difference here.

But first as to Mark Gold, your comment about development within environmentally sensitive areas is a fairly significant one. I don't think anybody wants to destroy environmentally sensitive areas. The procedure in all municipalities for SEAs generally are very severe and stripped. If you go into L.A. County or any county, they have a CEQA document, and you have to come up with mitigations if you're going to develop at all within an SEA, but there isn't a prohibition.

I don't know if you're suggesting there should be a prohibition in its entirety or that the CEQA document be followed, and within the CEQA document, storm water requirements should be looked at.

MR. GOLD: Not even that. That's actually clearly stated within the permit. What I'm suggesting is

that as an additional category to the seven categories, is that the eighth category would be any development in an SEA. So that would also have to meet a .75-inch standard, nothing more than that. We're not trying to prohibit any development, just SEAs.

VICE CHAIRMAN KESTON: Thank you very much.

And David, my question to you is whether we go to numerical limits or not, a lot of the comments here dealt with site-specific problems. Obviously if you have a site and you have a high water table, nobody would want to put a detention basin in there.

So how do you feel about the issue of not looking at each specific site, but perhaps looking at multiple sites? If there were specific limits, numeric or otherwise, it should be across an area, five sites or whatever, so that the City retains flexibility to deal with issues where each site can be looked upon differently, but overall they're solving the issue and the problem you're dealing with.

MR. BECKMAN: Well, I think that the standard and the proposal that's in front of you accomplishes that. One of the things you might not realize in listening to the majority of the testimony is that there is not a particular BMP that's prescribed for each situation, nor is there a particular suite of BMPs

that have to be selected, nor are there untested BMPs that are being forced upon anybody. BMPs, as was stated by Mr. Halprin, are already approved, and they can be mixed and matched and implemented and designed in a way that is most effective for site-specific conditions and --

VICE CHAIRMAN KESTON: But if one site can't meet a requirement of .75 inches because it is a parking lot, that's all it is.

MR. BECKMAN: Right.

VICE CHAIRMAN KESTON: How do you feel about taking the surrounding areas and say this one exceeds it by four times, but the other ones are half, and therefore you're meeting the requirement?

MR. BECKMAN: Like a trading concept is really what you're suggesting. I think -- NRDC's position is that we're not against the concept but we've never seen one that we think makes sense specifically. I think that would introduce many of the bureaucratic issues which the cities are raising, I think inappropriately, in the context of the current proposal. Then you have to figure out well, what is the precise contribution of one place versus another place. You would have to get into monitoring issues which are not part of this proposal. There are not numeric effluent limits being proposed here.

So in a certain sense I think that might go

beyond what you're even proposing because you have to introduce some kind of numeric effluent concept in order to accomplish it. I think that's very complicated, and I would not suggest that the Board go in that direction because of the reasons I've just stated.

VICE CHAIRMAN KESTON: So you think each site needs to be dealt with --

MR. BECKMAN: That's right.

VICE CHAIRMAN KESTON: -- and have its own limit?

MR. BECKMAN: I think the evidence in the literature suggests that sites can be mitigated because it's a proportional standard. It has to do with the size of the site, obviously, and for those reasons a small site will need smaller BMPs, a bigger site may need bigger BMPs.

MR. OWEN: Just to add one thing, because there has been some real world experience here locally on this for the last seven years in the City of Santa Monica, which has instituted their one-inch standard for parking lots. In that case, obviously from the standpoint of retention and how it's actually written in this case is you can either do treatment or infiltration, which I think is a keep point. But there were some areas in Santa Monica, some areas in Malibu, when they had an

ordinance which was stronger than what we were talking about today. Where Malibu you had some geologic hazard issues of landslide, and in Santa Monica you had some requirements of a promenade they had dealt with in that circumstance with an in-lieu fee. Rather than the pollutant trading concept, if someone is building a huge baby gap on the promenade, they have to retrofit a parking lot somewhere else in the city.

VICE CHAIRMAN KESTON: I see.

CHAIRMAN NAHAI: Any other questions for any of the speakers? I had a question for Ms. Rose Collins, City of Long Beach, if she's still here. I wonder if you would help me out with something.

I remember when we were dealing with the Long Beach permit and this issue was being discussed. One of the persuasive arguments that was made by the representative of the City was don't do this to the City of Long Beach now because we have to compete with our neighboring cities for developments to come in, we need to build up our tax base, and if you do this now, it wouldn't be an equal playing field. But at such time as you're going to adopt a county-wide standard, then we'll all have an equal playing field and we won't have this issue of competition. But then what happens is you try to adopt a county-wide standard and it's good and well, but what

about Orange County and after that it could be what about Nevada or neighboring states or Canada. Or we're in a global economy, and they don't have these kinds of standards in South America.

It would appear to me at first brush, anyway, that municipalities would welcome a regulation that would set a uniform standard for everybody so that they wouldn't be put in the position of having to compete with one another. How do you respond to that?

MS. COLLINS: I agree with what you're saying. We do want a uniform standard, and we are not opposed to numeric limits per se. If people have a different impression, they've gotten the wrong impression. What we're saying is and what we said during our negotiations was if the numeric limits, if we have the scientific data that says they are going to improve our beneficial uses in our receiving waters, we will go full force ahead. We believe in these programs. As you know, Long Beach is surrounded by water. Our residents enjoy it. Tourists come in. We want clean waters.

But we want to make sure that what we're doing is correct. We want to make sure that we don't get the cart before the horse, that we have a solution before we truly identify the problem, and we want to make sure that those dollars that have been identified by some of

the building associations here today, that they are appropriate. If they're appropriate, then let's do it. And if that's the cost, that's the cost.

It's true that if you have something in L.A. County and it's not in Orange County or Ventura or whatever, that there will be a problem because those on the fringes may go to another county to do their development. But it's my understanding that the Regional Board, once they start adopting these, whether they're working on L.A. County or Ventura County or the various counties, that they're going to try to this as uniform as possible. And I'm sure statewide would work with the other counties as well, because what makes sense in one county would make sense in another.

There is a dig difference between rural and urban developments, and that's one of the reasons in some cases, in the examples that you've seen earlier, have worked because they have the land to do it. And perhaps in Santa Monica with the waiver, something along that nature, could work for us as well, but we don't know, we haven't gotten into it, and I think that's one of the reasons the cities are so apprehensive about it.

They just want to make sure that this is the right thing and we're not asking developers to spend money that's not directly contributing to the mitigation

of pollutants going into our receiving waters and affecting beneficial uses.

CHAIRMAN NAHAI: Thank you.

MS. COLLINS: Thank you.

CHAIRMAN NAHAI: Do you have any additional comments?

BOARD MEMBER COE: I have questions.

DR. SWAMIKANNU: Just a comment, Mr. Chairman and Members of the Board.

On the issue of threshold of evidence, in terms of having site-specific impacts, I think the federal regulations themselves based on long-term study nationwide are including sites in California. It's been clearly established that pollution is associated with urbanization. That's related to population as well as traffic and things like that. And the point here is that we see exceedances of metals, for example, and organics in storm water in the Los Angeles region.

We have been monitoring for at least four years now, and water quality standards are being exceeded. So the issue in new development is that we are trying to at least -- trying to obtain water quality in some of these cases or at least prevent further exceedances or higher exceedances.

So for us to require that every single

situation be justified on the basis of site-specific data is simply, to me, wasteful and probably not anticipated by the act itself. There was a broad basis for these regulations. There is a broad basis for the permits, and we have to take the next step.

Thank you.

CHAIRMAN NAHAI: Dr. Coe.

BOARD MEMBER COE: Question. This probably should be addressed to the cities, but let me ask you a question. Apparently we need these numbers -- .75-inch, 24-hour period or 85 percent tile -- so engineers can design facilities. It's a design standard. It tells you how big that you're going to build something. It tells you how much volume of runoff you're going to be able to handle. If you don't have that, then every city could be have a different design standard in handling a little runoff over here, in another city, a lot of runoff over here. In other words, one city would be improving the water quality a lot and another city not or very little.

Is that the reason we have to have a design standard and some numbers here?

DR. SWAMIKANNU: Mr. Coe, the issue previously has been certainly that we have to be consistent in the region, we have to be consistent statewide, and sometimes you might want to have different

standards for different regions. But it makes no sense to have that kind of variation within the Los Angeles area. Perhaps L.A. County and Ventura County are different in some sense and we can justify a slightly different standard for Ventura County, which is still developing as opposed to Los Angeles.

The purpose of this clearly is to level the playing field for this region, and the number is based on reasonable justification that is recommended by preeminent national associations which have gone through this process. They have these rating charts for around the country, and so the time is now.

But the second issue is given the fact that for Los Angeles County in the unincorporated area, whether we adopt a numerical mitigation measure or not, there is going to be a performance standard, and the performance standard is going to be three quarters of an inch. As part of that L.A. County Department of Public Works is going to develop design standards for the separate BMPs they're talking about -- how large they ought to be, what dimensions, and that that could then be used for all the cities. Otherwise, the whole effort is limited to just the unincorporated area. The cost efficiencies associated with that kind of a broad use of a standard as being adopted by one municipality in this region, and --

BOARD MEMBER COE: Wouldn't there be an unfair economic advantage if one city is using a less stringent standard than another?

DR. SWAMIKANNU: The question is a difficult one, what is fair and unfair. I think cities are inherently different. I think as an agency, given the fact we cannot separate the pollution problem in this region, we don't know which city it's coming from, we don't know what the relative contributes are, we would then basically be reasonable and saying everybody make the same effort to solve the problem simply because we cannot allocate the relative contribution of pollution from each of the cities.

BOARD MEMBER COE: And we're providing the necessary flexibility among the cities to take care of on-site differences through the array of Best Management Practices they can pick and choose.

DR. SWAMIKANNU: Yes, Mr. Coe. If you look at the BMP list we adopted, it's a whole selection of BMPs. Nowhere do we designate a particular BMP as being preferred over another. So we primarily have the responsibility and the opportunity to identify the BMPs that work best in the situation in which the particular site is subject to.

BOARD MEMBER COE: Thank you.

CHAIRMAN NAHAI: Let me see if I can place this in perspective for myself, if I might.

As I understand the testimony that's been presented here today, nobody quarrels with the fact that SUSMPs are appropriate and that the BMPs are appropriate and everybody is wanting to go forward on that basis.

As I understand it, the only argument is that what is being proposed is that storm water runoff from storms in 24 hours, three quarters of an inch, that BMPs need to specifically address that so that one city isn't able to say I would only regulate storm water up to, you know, a tenth of an inch, whereas another one might opt for three quarters of an inch for L.A. County being three quarters of an inch, Calabasas being an inch; is that right? Am I correct in terms of characterizing what it is that we're talking about here?

DR. SWAMIKANNU: Mr. Chairman, I think there are probably a couple of issues that you clearly state the one interpretation of the comments that I've heard today, and that is the fact that there's no flexibility from city to city. But I think the larger issue also is that once we establish mitigation measure, then there's only one standard. The BMPs have to be designed for that. So the question is the standard that's being proposed, is it reasonable? Does it actually reduce

pollution in storm water runoff?

And an additional question is, is it reasonable? Is it economic in some sense so you're not being asked to treat the hundred-year storm, which you would be more concerned about human safety at that point. And our submission to you is the fact that we have had nine years. We started with public education and started with all the other components, things that the cities are already doing to elicit connection, elicit discharge elimination, those programs have been ongoing.

Here is an area that took us time to get there. It's new development that suddenly issues associated with that. What we are saying is this is a first step. We can consider pollution prevention Best Management Practices as somebody pointed out, but also engineers will tell you in some of the situations, many of the situations, you actually have to do treatment. Three quarters of an inch, based on the historical record, is 85 percent rainfall over 24 hours. And so by implementing the BMPs, we will be able to affect a large number of events in the future. And so the standard itself is not burdensome except for the fact that some haven't had the chance to analyze it. The fact that (inaudible) applied in other parts of the country as well as (inaudible) said that it's a reasonable and optimal, and there's a point in

time when you have to make a decision. Policy makers like you always have that difficult task. Do we wait for all the (inaudible) to come in, which it never does, or do we make the best decision we can at this point in time based on the information we have? And I think that is a charge that both staff and you face in this particular aspect of the program.

CHAIRMAN NAHAI: How do you respond to the contention that as of this moment there, isn't enough science on the effectiveness of this, that we simply don't know enough? Your contention would be that we've had nine years and had a whole bunch of studies, and that this is a justifiable and reasonable and cost effective step to take at this point.

DR. SWAMIKANNU: I would modify what you just said to the fact that BMPs, the effectiveness of BMPs, are not really region specific. They might relate to the rainfall and the sizing, but they're not rating specific. So if BMP works in Maryland for parking lots, it will probably work here. That kind of information has been put together in a database by the USEPA to answer the simple question of saying we don't know right now how effective BMPs are. And the whole purpose is to make municipal planners and engineers go to that database, to look at the information there, to see how effective these

BMPs are, but for the particular circumstances that the particular development is located in. So that information is out there.

What we are probably hearing is that these BMPs have not been tested in the Los Angeles region. Even to that I would say many of these BMPs are being applied. They probably don't have, except for anecdotal evidence, any monitoring evidence to say that these are functioning within certain ranges. We might have that.

Look at the other issue. Ventura County comes within our region. They have BMPs and they have monitored the effect of them. So there's information out there which might not be apparent to many of us simply because it's not been compiled for this region.

CHAIRMAN NAHAI: And you're saying that information, that you've analyzed that information and have come to the conclusion that the three quarters of an inch numeric standard is a reasonable and justified standard.

DR. SWAMIKANNU: There's some confusion here. The two aspects to it, Mr. Coe pointed out. One is simply the sizing of BMPs, how much volume do I address, not whether BMP is effective or not. Effective means removing pollutants. Different BMPs will remove different pollutants. The standard here we're talking

about is simply how big do I need to make these things. It's like I was telling somebody, if you look at the Federal Transportation Safety Administration, they would say you have to design ways to protect public safety, but they will also tell you what that safety design is based on. They would say driving at 30 miles per hour for maybe a hundred yards, and the occupants should be able to survive that impact. So they establish a standard. Otherwise, manufacturers would have no idea how to design the vehicles, and what we are proposing here is that kind of design standard, not really saying what -- whether it's a car or it's a van or it's a truck.

VICE CHAIRMAN KESTON: Mr. Chairman, I have a couple of thoughts that I would like to express.

First of all, Xavier, I think a federal design standard for highways where a highway is a highway and it's pavement, is very different than a standard for storm water where each site is different. It drains differently, it looks differently, it's a different size.

To make one standard fit a half-acre property or a seven tenths of an acre property that we heard this morning in -- next to a Boeing plant, and have that same requirement apply to a 2,000-acre pristine property up in the mountains just doesn't -- and some are urban and some are suburban -- doesn't seem to make sense

to me.

I can understand that you look at a region or a water shed as we do today. We say that water shed has to be at a certain level, but I find it very difficult to deal with taking a two-acre property, a half-an-acre property, a 50-acre property, and say they all should have the same standard because it isn't a car, it isn't a highway. It's a very, very specific thing.

And I think that's what most of the cities are saying. They're saying the issue here is whether we're suggesting that the BMPs are guidance to a city and we let the city decide how best to deal with each specific site, we say here's your umbrella, and you've got to deal with this. This is what we want you to do. Then if we come back and say you're not doing enough, we have that responsibility. Or we go and put a straitjacket around the city and say every specific site has to be dealt with in exactly the same standard, regardless of where it is in its structure, or whatever.

So I'm really kind of bothered by that kind of a standard, and I think Mayor Hardison from Torrance really said don't shove it down our throats. Give us some time to understand each other's position and work it out. And I think that's probably the appropriate thing to do. You may wind up at the same place some months from now,

but I think everybody needs to sit down -- it's obvious that there's a misunderstanding or a tremendous difference of opinion here. I think you want to get everybody together to deal with the issues, to deal with the specifics. And before we do what we might -- what we did under the NPDES permit where perhaps we didn't give people enough time to talk, I very much suggest we give a lot of time for people to deal with this issue.

I think approval of the SUSMPs by Dennis would be appropriate, but I would defer the numerical limits until after we have stakeholders meetings, and I would identify the BMPs as guidelines and today not as a requirement because that gets back to the same question of whatever. So that would be my suggestion, Mr. Chairman.

DR. SWAMIKANNU: Can I comment on what Mr. Keston said?

Basically on the BMPs there is a choice of BMPs, and all we are saying to approving the SUSMPs is where treatment controls are appropriate and where you designed them, you designed them for a particular site. So the flexibility is there. The other issue, you talked about regional BMPs as opposed to site by site. That certainly is an alternative that could be considered in certain situations where it might not be practical to address it at the location.

BOARD MEMBER COE: What effect would a delay in a decision not made today have on the program of implementing BMPs? I probably should know this, but there must be some kind of schedule and we don't want, I don't believe, the cities all started going out and constructing something that will be in violation of the standard later on.

DR. SWAMIKANNU: The attorney, Jorge Leon, is not here, but I'll try and answer that question.

There is a deadline on the permit, in the L.A. permit where we talked about implementing all requirements by this default deadline, which is July 30th, 1999. It's gone past that. We have approved some elements of development planning, for example, we've developed for the education component, identified priority projects and such. So the issue now is suppose we do approve the Standard Urban Storm Water Mitigation Plans. They would be able to look at source control BMPs, treatment control BMPs, construction controlled BMPs. But what wouldn't be there is for anybody looking to see how do I want to design treatment control BMPs.

BOARD MEMBER COE: Let me get some clarification, if I can, on what you said just before I asked my question.

Did you say that it's an opportunity in the

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permit as stated now or it could be added that a waiver could be approved by the Executive Officer, perhaps, if additions warranted different numbers than .75 and so on?

DR. SWAMIKANNU: That's a modification that Dennis might be able to make to the Standard Urban Storm Water Mitigation plans before he approves them. That possibility is not preclude by the permit itself.

BOARD MEMBER COE: It's provided in the permit, but it's not precluded.

DR. SWAMIKANNU: It is not specifically provided in the permit.

CHAIRMAN NAHAI: How do you respond to Dr. Gold's comments about environmentally sensitive areas?

DR. SWAMIKANNU: We -- when we worked out the Los Angeles County permit, the environmental community and other representatives in municipalities worked on it together, and that was an opportunity then to work out the language, which we did, and we established it to these seven categories.

Now for us to reopen the permit and add this environmentally sensitive areas would require a reopener, which is again almost like reissuing a permit. For us to say that what was submitted to us, which is the Urban Storm Water Mitigation Plans, is limited to these seven categories and not the eight that Dr. Gold would

like, for us to call it efficient is not within the terms of the permit.

I think it's an appropriate issue to look at when we reissue the permit, which is not that far away, couple of years. We should have included it perhaps in 1996, but we just missed it. It's not right to change the scope of the program midstream.

CHAIRMAN NAHAI: So you are saying that would have to be dealt with when the permits comes up?

DR. SWAMIKANNU: That would be the appropriate time.

CHAIRMAN NAHAI: Mr. Dickerson, do you have comments for us?

MR. DICKERSON: I wanted to make sure something is understood by the Board.

AUDIENCE MEMBER: Just when are we getting a chance to respond to the environmental community?

CHAIRMAN NAHAI: We've heard all of you, and I assure you that we haven't forgotten the testimony that was presented at the beginning of the hearing. It doesn't matter if testimony is presented at the beginning or at the end. Plus we have analyzed, digested, and read through umpteen letters and this much in materials regarding both sides of the equation.

I promise you we're used to doing this and

there is no need for rebuttal.

BOARD MEMBER LYON: Mr. Chairman, I need to interject something. This was not noticed as an action item.

CHAIRMAN NAHAI: It's not. It's an informational item.

BOARD MEMBER LYON: I would like to ensure the audience that no action is going to take place today.

CHAIRMAN NAHAI: The Board is not going to take a vote today. It's not an action item. If there is a point to be made that we haven't heard before, we'll entertain it for the sake of absolute completeness.

MR. YOUNG: Mr. Chair, thank you very much again. Rufus C. Young, Junior.

A point that I had not heard before is that apparently the several representatives of NRDC and the municipalities are in agreement on something, and that point is -- and I believe this is very close to a quote, if not an exact quote, nothing in the SUSMPs limits the discretion of the municipalities to choose the method. That is not what is in the SUSMP, and I trust that there is now agreement as a result of the Board process changing the sentence in the SUSMPs that say the SUSMP outlines the necessary BMPs which must, mandatory word, be incorporated. If that is changed to discretionary, I

think we have the case of at least one municipality in agreement with the NRDC.

There is one remaining point that should be crystal clear. No one should leave this room with the view that the City of Alhambra opposes stenciling or signage.

(Laughter)

MR. YOUNG: My question was to use the book of Mica, 6-8, "What does the Lord require of thee but to do justice, have mercy and walk humbly with thy God?"

I would paraphrase that. Alhambra asks, "What does the Board -- what do you, the Regional Board, require of the cities to in turn require of the developers?" And that's our point. It's not opposition, it's how do we implement.

Thank you very much.

CHAIRMAN NAHAI: You're all going to make me regret this, aren't you. It's this lady and that's it.

AUDIENCE MEMBER: I just wanted to say that, and what we meant to say and I think what we did say, is that nothing limits the discretion of the cities within that suite of BMPs that have been provided to meet the standard. That's not to say they don't have to meet the standard or don't have to do some or one or a combination, but that there's not a prescribed BMP or a

prescribed situation, as Mr. Keston was concerned about, provided in this proposal.

VICE CHAIRMAN KESTON: Could they use others outside this list if something is better?

AUDIENCE MEMBER: I think -- I'd have to look at the text. I think the list that's provided is broad enough that virtually anything they would want to do is in there.

VICE CHAIRMAN KESTON: It's not just what's in that list, it's anything that would solve the same purpose.

AUDIENCE MEMBER: I think that the list was intended -- the reason you approved the list was to narrow from the universe of possibilities to those which you believed were appropriate, but there's a number of those that are appropriate for different situations in the list.

CHAIRMAN NAHAI: That's the list we've already approved.

AUDIENCE MEMBER: That's right.

MS. CLOSE: My name is Barbara Close. I'm with U.S. Grinder Woodward Plied, and our firm and other consulting firms have worked with the permittees in what has been submitted to the Board. I do want to make sure the Board understands that these Standard Urban Storm Water Mitigation Plans are not the only plans the

permittees have to deal with.

The Standard Urban Storm Water Mitigation Plans are not the only way development is regulated. The seven were picked because they're very broad categories of development. Mr. Gold has a concern that environmentally sensitive areas will somehow be overlooked.

Every city, in complying with the permit, has to identify priority projects in the development process. Each one of those development projects, whether it's been identified as priority, even if it's not one of these seven, have to submit an Urban Storm Water Mitigation Plan. So just because it's not one of these seven does not mean it's not going to be regulated.

I just want to make sure the Board understands that this isn't just something that's very narrowly focused on those seven categories.

Thank you.

CHAIRMAN NAHAI: Thank you.

No, no, no. I said you're going to make me regret this. We have to stop at some point. That's it. You've already spoken five minutes.

AUDIENCE MEMBER: Just ten seconds.

CHAIRMAN NAHAI: No. Thank you.

MR. DICKERSON: I want to thank the Board very much for sharing the burden that was imposed upon me

by that permit, and it's clearly something I appreciate very much. Thank you.

I do want to thank Xavier very much for his efforts in trying to explain this very complicated issue today. It's very appreciated. Thank you, Xavier.

The first comment is I just want to apologize to anyone who did not receive adequate notice regarding this. We did have a workshop on August 10th. We discussed this in detail. We did, at that time, indicate that we would be here today. So there was at least constructive notice, if not actual to some of the individuals. And there have been a number of individuals here today who we've not seen before, and I would ask that they be sure to provide their business card to our clerk so that we can be sure to ensure they are on our list to the proceeding in future notice.

Several points come out today that I think are very important. One is the clarifying language of what is specifically proposed in the SUSMPs, both what has been proposed to us and also what has been proposed by us. It seems that some additional work in that area might be very beneficial.

It's also very clear that a very solid record needs to be developed, probably beyond what we have already, with regard to this proposal in order to ensure

that it can withstand the scrutiny of subsequent legal action. I have a sense, no one has said that directly today, but I at least have a sense it could be the source of some controversy down the road if it were to be approved. I do have a concern about that.

As I noted at the beginning, at least given the controversy, the depth of the feeling and certainly I would echo Mr. Keston's comments about the desirability about having additional discussion, and it may be that through that some approaches might rise to the top that suggest that there's great unanimity on some suggested fairly quickly, while others perhaps need more in-depth discussion. So I would be very much open, as I suggested earlier, and would happily take this matter for further consideration.

With the benefit of this discussion today, I would ask the Board whether or not, given that opportunity for additional review, whether or not you would want to hear this again. I'm more than willing to take the burden from this point and finalize a proposal that I could then approve at some point in the future.

Thank you.

CHAIRMAN NAHAI: Well, do we have questions of Mr. Dickerson?

BOARD MEMBER DIAMOND: I do have one

question. How much -- you mentioned you were concerned about legal issues in the future. What about the fact that we are behind the eight ball right now already having the deadline of July 30th, I believe. Having passed, what kind of ramifications does that have?

MR. DICKERSON: We do have a permit that says that the development planning elements of -- well, actually there's a number of different model programs, five model programs, and they all have to be in place by the 30th of July. Each of those are in place at this point in time, and storm water planning, the implementation of Storm Water Management Plans, should be ongoing at this point among of the all the permittees in the county, so a lot of work is going on. I don't see our co-counsel any longer, and I would actually like to get some guidance from co-counsel with respect to that.

My initial sense is that we could probably, if there's not a legal bar to it, that the extra time might be very well spent.

BOARD MEMBER LYON: I --

CHAIRMAN NAHAI: Go ahead.

BOARD MEMBER LYON: I just wanted to say that as one Board Member, I would like to help you in your decision making process. I would have to defer to the rest of the Board as to whether they want it to come back

to this type of meeting again, but I don't think we should leave you adrift out there in your decision making process. I think the Board should aid you in direction as you meet with the stakeholders on this. So that's just my opinion.

CHAIRMAN NAHAI: I also agree with what Marilyn is saying. I don't think it's right or fair that we not share this burden with you. I think the issue is -- and if your recommendation is that more time be spent on building the record, then I would concede to -- if that is your recommendation, as it appears to be. But I would be very concerned about time and how much more time and at what stage are we going to bite this bullet and deal with the non-point source problem that so plagues us.

And I would just say to the municipalities that are here, at some point we're all going to have to bite this bullet together, and at some point we're all going to have to make sacrifices -- I will as a taxpayer, just with the rest of all of you -- to try to deal with the pollution of our waterways, and I would just plead with you that at some point where you come to realize, as a citizen of this area, that there is sufficient evidence there to adopt these standards, that we don't do it just for the sake of short. We don't reject it just for the

sake of short-side considerations, and we think about what's going to happen to the future of our region.

So with that, I will ask you how much more time?

MR. DICKERSON: I would not want to go beyond the end of the year. That would probably be an adequate time to at least vent the issue somewhat more.

BOARD MEMBER LYON: That would give the regulated community an opportunity to analyze the recommendations again, the three quarters of an inch. I think the cities, they've been here today, they've listened this and they can go back and ask their public works director what it's going to mean to our city cost-wise, can we do this, what kind of charges are going to be involved.

The cities are limited and they can't just raise taxes any longer. That ability has been taken away from them. So they need to go away from here and think about it and bring that back.

BOARD MEMBER COE: Mr. Chairman.

When does the permit come up for renewal?

MR. DICKERSON: The permit will be before the Board again in July of 2001. New applications are required to us by January 1 of 2001.

BOARD MEMBER COE: So this gives staff and

the Board and the permittees an opportunity to thoroughly reevaluate their experience with this permit and make any changes that are required.

MR. DICKERSON: Certainly within the next permit.

CHAIRMAN NAHAI: So your suggestion is that we have another delightful gathering like this --

(Laughter)

CHAIRMAN NAHAI: -- at our December meeting where we can revisit with old friends?

(Laughter)

MR. DICKERSON: Once again, thank you for sharing the burden.

Perhaps given the fact that we probably will have -- we may very well have a crowded agenda, we may want to set a special meeting time for consideration of the final proposal. Would that be acceptable to the Board?

BOARD MEMBER LYON: Yes.

CHAIRMAN NAHAI: I think it's an issue of tremendous importance.

MR. DICKERSON: And this is subject, of course, to making sure that our counsel says that that's okay to do.

CHAIRMAN NAHAI: I see our counsel nodding

his head and her head.

MR. DICKERSON: Thank you.

CHAIRMAN NAHAI: Thank you.

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

PUBLIC MEETING/HEARING

TRANSCRIPT OF MORNING PROCEEDINGS

January 26, 2000

9:15 A.M.

Holiday Inn
303 East Cordova Avenue
Pasadena, California

REPORTED BY:

Caroline Jetter,
CSR No. 11568
Our File No. 1-62540

APPEARANCES:

BOARD MEMBERS:

CHAIRMAN H. DAVID NAHAI
MARYLYN LYON, VICE CHAIRMAN
JACK J. COE
SUSAN CLOKE
FRANCINE DIAMOND
TIM SHAHEEN
ROBERT MILLER

ALSO PRESENT:

DENNIS DICKERSON
JORGE LEON
DR. XAVIER SWAMIKANNU
ROBYN GOODMAN

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CHAIRMAN NAHAI: Good morning, ladies and gentlemen. We have a quorum of the board present and so since it's about 9:15, let's get the proceedings underway.

We'll start with the pledge of allegiance. And I would like to ask Dr. Jack Coe to lead us in the pledge.

(Pledge of allegiance.)

CHAIRMAN NAHAI: Could we have the roll call, please.

MS. GOODMAN: Ms. Cloke?

MS. CLOKE: Present.

MS. GOODMAN: Mr. Coe?

MR. COE: Present.

MS. GOODMAN: Ms. Diamond?

MS. DIAMOND: Present.

MS. GOODMAN: Ms. Lyon?

(No response.)

MS. GOODMAN: Mr. Miller?

(No response.)

MS. GOODMAN: Mr. Nahai?

CHAIRMAN NAHAI: Present.

MS. GOODMAN: Mr. Shaheen.

R0071904

MR. SHAHEEN: Present.

CHAIRMAN NAHAI: We'd like to ask the executive officer if there are any changes to the agenda.

MR. DICKERSON: Good morning, Mr. Chairman.

Thank you. With regard to changes in the agenda, we are continuing item 3, which is the approval of the minutes from the December 9 and December 20th board meeting until the January 31 board meeting. We will have that available at that time.

Continuing items 9.4, Golden West refining company and 10.1, Carrier Corporation, until future board meeting. There are several issues that still remain on those permits that need to be addressed.

We are continuing item No. 12 Sun Coast Calamari, ACL until future board meeting. We are in discussions with that particular company to ascertain some specific facts surrounding that ACL.

We're continuing item 13 WDR in the TSO county of L.A. Trancas sewer treatment facility until a future board meeting. We have a request from the county to delay consideration of that. We will hear it, though, in the very near future, the board meeting.

Removing Ojai Valley Sanitation District ACL, that's item 14. The matter has been resolved. The sanitary district has made their penalty in full.

Continuing item 15, L.A. Turf Club ACL. This matter is going to be brought back for further consideration of -- for the board. There is a settlement offer that they wish to bring to the board, and we will have that for you at the next board meeting. Actually, it's March 2 board meeting if that's the one you got.

MS. CLOKE: That's number 15?

MR. DICKERSON: I'm sorry? Number 15, yes. And those are the changes for today.

CHAIRMAN NAHAI: We don't need to vote on it. The next item then on the agenda is item No. 4, which is the report of the nominating committee on the election of officers for the coming year. Dr. Coe?

MR. COE: Thank you, Mr. Chairman. The nominating committee this year consisted of Francine Diamond and Susan Cloke and me. The Porter-Cologne Act requires that the board elect officers the first meeting of the year. And so we're doing that.

The nominating committee after not too much deliberation and in view of the excellent leadership this past year, the unanimously nominating continuation of the present leadership with David Nahai as chairman and Marilyn Lyon as vice chairman, and we so nominate that slate of officers.

MS. CLOKE: We need a second for that. I'd like to second that.

CHAIRMAN NAHAI: All in favor?

BOARD MEMBERS: Aye.

CHAIRMAN NAHAI: So carried. I have to tell you by "excellent leadership," Dr. Coe means that they couldn't find anybody else to do it. So but thank you very much for that.

Going on the next item on the agenda is the consideration of the 2000 board meeting schedule. So we're all yours.

MS. GOODMAN: You just have to make a motion to adopt the schedule as presented.

CHAIRMAN NAHAI: Do I have a motion to adopt?

MS. DIAMOND: So moved.

CHAIRMAN NAHAI: We have a second. All in favor?

BOARD MEMBERS: Aye.

CHAIRMAN NAHAI: Any opposed? Carried.

Next item on the agenda is the board member ex parte communication disclosure item. Does any board member have any ex parte communication to report?

MR. COE: Mr. Chairman, I received a call yesterday from Paul Schoenberger of the West Coast Central Basin Municipal Water District discussing item 9.2 on our agenda, the Wheelabrator Norwalk Energy Company permit.

The problem that they have is apparently the energy company, which provides energy to the Metropolitan Hospital, will not buy recycled water from the water districts if the board approves the effluent limits as suggested by the staff.

The alternative as presented in our agenda is the use of potable water from the city supply for the cooling water, and its two sets of effluent limits. One for each supply water for cooling.

Now, we're talking about 200 acre feet that's involved, and I know the board's very much

interested in conservation and recycling of water in this Southern California.

And as I understand it, the representative of the water districts will be here today to comment on that.

CHAIRMAN NAHAI: All right. I have one item to report. I have received a call from the principal of a company called Charles Company. The gentleman had some questions to ask me about enforcement procedures with respect to a matter that is being handled at the staff level.

I answered his questions as to general procedural issues but told him that I couldn't comment at all with respect to the substance of any issue, and I just want the record to reflect that I did receive that call.

With no other items, let's move on to item No. 7, which is the uncontested items calendar. Are there any changes here, Mr. Dickerson?

MR. DICKERSON: Mr. Chairman, I would ask that the consent calendar be approved items 9.1 through 9.3, 9.5 and 9.6, 10.2 through 10.10 and item 16.

CHAIRMAN NAHAI: Do we have motion for approval?

BOARD MEMBERS: So moved.

MR. COE: Does that mean 9.2 is still on the consent calendar, Dennis?

MR. DICKERSON: Yes.

R0071908

MR. COE: If it's no problem with the discharging then.

MS. CLOKE: I'd like to second that, and I'd also like to just point out for the record and for people in the public that item No. 16, which is on our consent calendar, is a resolution in support of the safe neighborhoods parks, clean water, clean air and coastal protection.

COURT REPORTER: Can you move it just a little closer?

MS. CLOKE: I am seconding the consent calendar and pointing out for both the record and the members of the audience present today that item No. 16 on the consent calendar is a resolution in support of the Safe Neighborhood Parks, Clean Water, Clean Air and Coastal Protection Bond Act of 2000 and the Safe Drinking Water, Clean Water, Watershed Protection and Flood Protection Act.

And I wanted our support for that measure to be very publicly noted.

MR. COE: Mr. Chairman, next on the consent calendar I will abstain from 9.3.

CHAIRMAN NAHAI: Okay. Any other comments with respect to any consent calendar item?

All right. I'd just like to add to Ms. Cloke's comments the support of the board for item No. 16. And please vote for it when you get the chance.

MS. DIAMOND: Would you please note what

those proposition numbers are since we're asking people to vote for them.

CHAIRMAN NAHAI: I don't have the proposition numbers here unfortunately.

MS. DIAMOND: I think it's 13 and 12. Propositions 13 and 12.

CHAIRMAN NAHAI: Going on the next agenda item is the public forum. I have two cards. The first is from Mr. Richard Lambros.

MR. LAMBROS: Good morning, Mr. Chairman, members of the board. My name is Rich Lambros. I'm with the Building Industry Association of Southern California. I rise during this part of your agenda today to reenforce a letter that we had sent over the board staff yesterday afternoon.

It arrived late. So in the event that you have not received it, I've additional copies that I would be happy to hand over to whoever would be appropriate at this time.

Robyn, if you don't mind. **R0071910**

The letter comments on a number of concerns we have regarding another item on your agenda today and that being 11, the SUSMP proposal.

Our concerns are in regard to the public access in the way in which the public comment in the particular section of today's agenda has been arranged. And our letter makes a request that the board consider modifying your plan to have two, 30-minute presentations

to include a third 30-minute presentation.

The two presentations you're allowing for today were set up to allow for the pro and con side of this argument.

But I think if you've been reading the numerous letters that have arrived on this subject, it's pretty clear that the arguments do not neatly fall into pro and con.

They fall into, we argue, three distinct categories: The position of the permittees, the position of the environmental community and the position of the regulated community.

You've allowed time for the permittees to address you today. The other half-hour you've allowed time for the environmental community to address you today. They have a half hour, do not allow the half hour of time for the regulated community, and we would very much appreciate that opportunity on your agenda today.

We have the speakers here today. If the time were allotted, we think we could put together an effective presentation.

R0071911

CHAIRMAN NAHAI: Thank you.

MS. CLOKE: How much time did you have in mind?

MR. LAMBROS: Excuse me?

MS. CLOKE: How much time did you have in mind?

MR. LAMBROS: We were hopeful for an

equivalent amount of time as the other two components of this complicated issue. So we're requesting a half hour of time as well.

CHAIRMAN NAHAI: Do you have ten speakers here today?

MR. LAMBROS: Yes, we do.

CHAIRMAN NAHAI: Well, then, after the two half-hour segments are over, every -- I hope that everybody in this room who wants to speak will get a chance to speak. If you have ten speakers, they'll get their three minutes each.

MR. LAMBROS: Mr. Chairman, we appreciate that. Our concern is that in fairness to the complexity of the issue, you're hearing from two of the key components, but you're not allowing an equal presentation for the third components.

Under your rules, our presenters will be interrupted by someone from the other side, not allowing for a cohesive presentation of what we think is a comprehensive report.

CHAIRMAN NAHAI: Let me just respond to you. I think your comments should have really been part of item No. 11, and we should have heard them at that point.

But what we've attempted to do is to come up with a procedure that -- that hears both sides of the issue to the extent that there are two sides and enables every person who wants to make a comment to do that.

This is the procedure we came up with. This is what's been disseminated. We think it's as impartial and fair as we could get it.

It should also be understood that this is not by any means the first hearing on this issue. We had an all day hearing September 16 where many members of the organizations appeared and spoke, made their points clear.

There was an all day workshop, I think, in August. There have been many other meetings and discussions regarding this. Just for this meeting, the members of this board have reviewed something like four folders of documents with the members of your industry being very well-represented and points being very succinctly and clearly made in repetitive and great detail.

I think we -- we reviewed something like two or three inches of documents before the September meeting, again, with those points very widely made. So I think we've decided on our procedure, and it's as fair as we could do it. It's as impartial as we could do it.

And at this point in time, while I appreciate your comments, that procedure is not going to get changed.

MR. LAMBROS: May I respond at all, Mr. Chairman?

CHAIRMAN NAHAI: It's the decision. So -- go ahead. Of course.

MR. LAMBROS: Well, Mr. Chairman, as you know, the memo that came out for this procedure said that the board in fairness was going to allow some time on the pro side and some time on the con side.

The fact of the matter is, though, that you designated one individual from the EAC and one individual from NRDC, that being the permittees and the environmental community to coordinate that time.

We called both sides in this equation and requested inclusion in their 30 minutes. We feel as if time was allotted to those two components of this equation, the time was not allowed to the regulated community.

We're the ones who are going to live with this regulation. We think it's important that you allow an equal amount of time for us to present a competent presentation today.

CHAIRMAN NAHAI: I understand. And I'll tell you what. Once all of your members have spoken during the segment that they'll speak at, if at the very end of the day there is time left, after everybody has had a chance to speak on the issue and members of your organization feel that there is a point that hasn't been made, then I'd be more than happy to hear from you so that you can make sure that any point that you think that this board should take account of which hasn't already been included in the speeches during the day in the four folders of documents and the two inches of materials

before the September 16 meeting and the arguments that are going to be presented today, if at the end of the day there really is a point that hasn't been made, then I'll hear from you at that time.

MR. LAMBROS: Well, Mr. Chairman, I appreciate that. Our hope was that we could cover those points on the front end and not have to wait at the end of the day. Thank you.

MR. LEON: Mr. Chairman, it escaped my knowledge that we didn't take a vote on the consent decree. I wonder if we can have a -- I'm sorry. Not the consent decree but the consent calendar.

CHAIRMAN NAHAI: I think we have --

MR. LEON: Did they have an actual vote?

MS. CLOKE: I think -- want to vote again?

CHAIRMAN NAHAI: We'll vote again. Can I have a motion for approval of the consent calendar.

MS. LYON: I'll move.

MS. CLOKE: It was seconded by me about my comments about the --

CHAIRMAN NAHAI: About items --

MS. CLOKE: About 12 and 13 of the --

CHAIRMAN NAHAI: Thank you.

MS. CLOKE: -- proposition.

CHAIRMAN NAHAI: Just so Jorge is happy, all in favor?

BOARD MEMBERS: Aye.

CHAIRMAN NAHAI: Any opposed?

The next card I have is from a Mr. Paul Schoenberger, and I would ask that, if these comments are about item No. 11, let's leave it until we get to item No. 11.

MR. SCHOENBERGER: Thank you. Good morning, Board members. My name is Paul Schoenberger. I'm the chief of engineering and operations for the Central Basin and Municipal Water District.

And Central Basin Municipal Water District, we have the task of wholesaling imported water to an area of Los Angeles county that covers more than 1 million people.

And one of the cornerstones of the water resources management that we've been doing for the last ten years, is our recycled water system where we've been developing sources of recycled water, constructing distribution systems and finding users for this resource to stretch the water resources in our area.

And so with that, we are a very large supporter of recycled water. I know the board is a supporter of trying to increase the use of recycled water as most of the community in California, the water community in California is.

I just would like to point out that an item on the consent calendar which we support, which is item 9.2., the Wheelabrator Permit. That item has -- is in regard to a discharge. And in that what the -- the point I want to come out and discuss today is that recycled

water is treated very differently than potable water in this permit and to an extent that would exclude its use.

And in that permit, there are two different limits placed upon the discharger depending upon whether they use potable water or recycled water.

And in our view, the recycled water limits are extremely strict to the level that no source water, whether it was state water, Colorado River water, groundwater or recycled water, could meet those limits. So effectively excluding recycled water as a use.

I don't want anything that I say today to dissuade the board here from passing that permit. I just want to point that out and that I think it's really contrary to the board and our districts and the state's goal of trying to increase the usage of recycled water in the area.

This particular use is a very large user, and they represent a potential 5 to 7 percent increase in our total reclaimed water system. We've already spent to date about $50 million in this system, and it's just unfortunate that the recycled water is being inhibited from being used in this case.

And the recycled water that we would be able to serve this user really is not very different than potable water. It meets all the drinking water MCLs. It's -- you know, you can distinguish it from potable water but just marginally.

So we look forward to working with your

staff in the near future to hopefully come up with a revision on the water recycled side of that permit so -- and come back to the board with a modification to the permit. That would allow recycled water to be used in this instance. Thank you very much.

MR. COE: I have a question.

CHAIRMAN NAHAI: Sure.

MR. COE: As I understand this Wheelabrator needs water for cooling, and if they use reclaimed water, then according to the effluence limits here in our proposed permit, they have to monitor and analyze for, looks like, maybe 15 or 20 additional constituents phenols and heavy metals and --

MR. SCHOENBERGER: Yes. Metals --

MR. COE: -- so on. And they're not willing to go to the extra cost of doing that and they would, therefore, not use reclaimed water but use city water; is that correct?

MR. SCHOENBERGER: The cooling tower process concentrates up whatever source water there is and before it's discharged. So with the limits, the additional limits on the recycled water side, there's no source water available to them -- potable, groundwater, you know, state project water, Colorado water or recycled water -- that would be able to meet those limits.

So it precludes them from using the recycled water.

R0071918

MR. COE: As I understand it, you met with

staff more than once to discuss this.

MR. SCHOENBERGER: Correct.

MR. COE: Thank you.

CHAIRMAN NAHAI: Thank you, Mr. Schoenberger.

With that, we'll move to number 11, which is the SUSMP public hearing, and I've asked the executive assistant to read the opening statement.

MS. GOODMAN: This is a public meeting to consider board action regarding Standard Urban Storm Water Mitigation Plan which have been submitted to the executive officer pursuant to the requirements of the Los Angeles County Municipal Storm Water Permit order number 96-054.

During this public hearing, staff will provide a report to the board detailing the executive officer's intention to approve the Standard Urban Storm Water Mitigation Plan with changes and ask the board to adopt a resolution expressing the Regional Board's expectations regarding the SUSMP approval.

Copies of the Standard Urban Storm Water Mitigation Plan were sent to the U.S. EPA State Water Resources Control Board and other interested agencies, persons and organizations.

The order of presentation of testimony at this meeting will be announced by the chairman. Anyone so desiring will be heard. If you have not filled out one of the blue speaker cards located on the table at the

back of the room, please raise your hand, and we will get a card for you to fill it out.

It will be appreciated if all persons appearing before the board will leave written copies of their testimony, if available. The board will consider all testimony.

However, in the interest of time, it is requested that all repetitive and redundant statements be avoided. The setting of time limits for the presentation of the evidence is at the discretion of the board.

Mr. Chairman, would you now open the hearing and administer the oath.

CHAIRMAN NAHAI: I shall. Could I ask all of you who are going to give testimony in this matter please stand and take the oath.

(People sworn in.)

CHAIRMAN NAHAI: Let's talk a little bit about the procedures that we're going to follow, which I know Mr. Lambros doesn't like, but it was the fairest way we could divide to hear all of you.

What we're going to do is this: First of all, we'll have the staff presentation. After the staff presentation, there will be two half-hour segments which will be devoted to ten speakers each so that those speakers cannot exceed three minutes per person.

Those two segments will attempt as much as possible to advocate one position or another with respect to the staff proposal that's before us today.

The board members will hold their questions until the end of each of those presentations. In other words, we'll allow the staff to make their presentation. At the end of that presentation, the board members will ask questions, if they wish to.

Then one side for 30 minutes and at the end of that, the board members will pose questions to those speakers, if they wish to. Then the second 30 minutes out with questions, if there are any.

Then once those two 30-minute segments are over -- in other words, once we've heard from those 20 speakers, then it will be opened up to anybody who hasn't spoken and wishes to. And each person will be limited to three minutes each.

I heard that one person had turned in -- I don't know -- a number of cards because he thought that he represented a number of different interests. That's not the way it's going to work. Okay? Three minutes per person.

That's the only way that we can think of doing this so that we can hear from all of you during the day. Now, if at the end of the day we have time left over, I'll open up the podium, again, to anybody who feels that there's, you know, a burning point that hasn't been made during the presentation.

But you may also wish to think as we go along that, you know, we've reviewed a great deal of materials. We've heard many arguments. So if you see

that another speaker has already pointedly and emphatically made the argument that you wish to make, you know, you may wish to decide that it's not necessary to speak. So I'll just leave that up to your discretion.

Now, the three-minute rule is absolutely strict. In order to help you and to help me, we have that flashing thing there. We put it on a box so you can really see it. And when it gets to three minutes, it's going to flash; is that correct? And at that time, please stop.

I don't enjoy, you know, interrupting speakers. I really don't. So I'd really appreciate it if you won't make me do that. So once you see the flashing red lights, we promise you it's been synchronized for the proper three minutes, and please stop speaking. Thank you very much.

With that, I'd like to invite the staff presentations. And it would also be nice, if you have cell phone conversations, please step outside. Thank you. Just as this gentleman is doing.

MR. DICKERSON: Mr. Chairman, members of the board, good morning. It's perhaps fitting that agenda in item 11, Standard Urban Storm Water Mitigation Plans is on the agenda for today, our 50th anniversary as a Regional Board.

At the very least, what the board does today will serve the key point of reference in our quest to meet the mission of the Regional Board, to protect and

restore the water quality of this region.

Before I begin my formal presentation, I would like to take a moment to thank Dr. Xavier Swamikannu for his tireless efforts to manage this permit.

This is one of the most significant storm water permits in the nation and one of the greatest water quality challenges we face as a board. And yet we have only a fraction of one person funded to manage this permit.

I would also like to thank the members of my staff who over the past few weeks and days have been drawn into maelstrom of activity, especially Robyn Goodman and Ronji Harris, who responded to my urgent cry for help with good nature and dedication. Thank you.

And Jorge Leon, who has also been instrumental in developing a legal basis for this action which you have in the staff report. My sincere appreciation to each of you. Thank you.

The notion of a Standard Urban Storm Water Mitigation Plan for SUSMPs, and it's usually in the plural SUSMPs is rooted in the Municipal Storm Water and Urban Runoff Permit issued to the county of Los Angeles and its 85 municipalities in 1996.

The permit requires that SUSMPs be developed for at a minimum several development categories. These include home subdivisions, commercial developments of at least 100,000 square feet in size,

automotive repair shops, retail gasoline outlets, restaurants and single-family homes on hillsides.

Once adopted, the SUSMP would be a set of standards or criteria that developers and architects could use to design their projects in ways that will result to those properties contributing inherently less pollution when it rains.

Cities would use the SUSMPs to adopt their own enforceable ordinances and then apply them in their review and approval of project plans. SUSMP standards only apply to new development or substantial redevelopment projects in the applicable SUSMP categories.

As a consequence, the applicability of SUSMPs is limited, and their consequent effect on storm water quality in our streams will, at first, be relatively small.

As years pass and more and more property is redeveloped, a greater percentage of urban land will be retrofitted with SUSMPs. Eventually much of the L.A. Basin will gain the benefit of some enhanced level of storm water management.

It must be remembered, however, that SUSMPs are only a small part of the 1996 storm water permit requirements. Many other aspects of that permit address other issues and current problems.

R0071924

SUSMPs are simply one long-term approach to address the ubiquitous problem of pollution from storm

water runoff and to address that problem for new development to prevent the problem from getting worse. That problem is pervasive and growing.

Storm Water is the vehicle by which pollution that is deposited on our highways and roads, our curbs and gutters, our yards and alleys, is conveyed to our streams and to the ocean. And we did have some slides which are identifying some of the actual water quality impacts, the very early on, Jack, if they haven't been up yet.

When it rains, the runoff carries amazingly large amounts of pollutants that reach the ocean. It adds to toxic levels of sediments in estuaries which contribute to the deterioration of our aesthetic environment and the degradation of the aquatic environment.

The amounts of these pollutants that reach our streams every year are not measured in ounces but in thousands of pounds. And in the case of water-borne litter, hundreds of tons each year.

The problem is real. And the contribution of these pollutants contributes to many of our streams being listed on the federal 303(d) listing of impaired waters. These are impairments for which total maximum daily loads or TMDLs are required and their requisite load allocations and implementation plans to remove those impairments.

R0071925

Briefly, we are here today to consider what

are the appropriate SUSMPs to apply to categories of the developments in the staff's SUSMP proposal. We began this process with the formal submittal of SUSMPs to the Regional Board by the principal permittee of the 1996 permit. That's the county of Los Angeles.

In reviewing that submittal, staff determined that additional requirements were needed to enhance the SUSMPs submittal. After a public workshop last August, staff proposed the addition of numerical design standard to establish the size of Best Management Practices which are simple and common-sense techniques to reduce the amount of pollution in storm water runoff.

Under the terms of the 1996 permit, the executive officer is vested with the authority to approve the SUSMPs. However, by proposing a significant modification of the SUSMP by including a numerical design standard, I sought Regional Board concurrence with that recommendation.

A hearing was held on September 16 before the Regional Board. The outcome of that hearing was your agreement with my recommendation that a better record was needed and possibly some modifications to the SUSMP proposal were necessary.

The result was a series of discussions with interested parties that led to our publishing a December 7 proposal which is now before you in your binder as pages 11-1 through 11-19.

R0071926

A formal staff report has been developed,

which is dated January 18, and was submitted to you separately. Additionally, a change sheet has been issued and is being augmented today.

The SUSMP before you, the proposal before you, while an extensive document, is really quite simple and much of the language of the proposal is also noncontroversial and carries over from the text of the SUSMP submitted to the Regional Board last August.

Since the September 16 board hearing, some changes have been made to the proposal in an effort to create flexibility and to recognize the problems associated with the implementation of any substantive permit requirements.

Some of these have become the focus of additional controversy adding to the numerical design standard that was a principal point of controversy last September.

The proposal itself is partitioned into several main segments. These are definitions and then requirements applicable to all SUSMP categories. These include a number of specific areas: Peak storm water runoff rates, conservation of national areas, minimization of storm water pollution through use of BMPs, protection of slopes and channels, providing storm drain identification, proper design of outside storage areas, proper design of trash storage areas, establishing proof of long-term BMP maintenance and design standards for treatment controls.

That last item which is applicable to all categories, design standard for treatment controls, is the numerical standard which is the focus of so much controversy.

There are also specific requirements applicable to certain categories. Most of these provisions provide additional BMPs for certain types of development where those are believed necessary to provide additional controls to reduce storm water pollution.

Two additional categories of SUSMPs have been added, parking lots and environmentally sensitive areas which result in additional requirements. To build in some flexibility to the provision, a waiver provision has been included which is carefully defined and limited to certain circumstances.

Some of those are infiltration BMPs may pose a risk to groundwater quality under certain circumstances. So a waiver can be applied at that point.

There also may not be adequate space available to use BMPs. So a waiver option is allowed. And finally, soil conditions may not be suitable for infiltration BMPs. Therefore, allowing a waiver seems appropriate in that circumstance.

Remember the waiver provision is something designed to allow flexibility. The final element is provision for the county and cities to use a professional certification to represent the adequacy of the project plan as meeting the SUSMP requirements rather than having

to review and approve those documents themselves resulting in additional work by city plan review staff

I'm very sensitive having a staff that's already overworked as having to impose more work at other staffs in the cities.

Those are the fundamental elements of the SUSMP proposal. As you move to consider this matter, I would request that you think of it as two distinct proposals. First, the basic SUSMP, which is everything but the numerical standard. And then of course the numerical standard itself as the second major element.

The former is a lot less controversial than the latter. Also keeping them separate will allow you at the end of the day to perhaps provide greater clarity in your direction to staff.

So as you know, we have developed a change sheet. And so the question is what was wrong with the proposal as it was written that requires changes? First, let me talk about the basic SUSMP. To begin, we needed to better state some of the definitions.

We received various comments on a number of points of the proposal. Hillsides were one area where change was felt needed. The definition was not adequate. So in response to comments, we have now added additional clarity to state the hillsides are property located in an area with known erosive soil conditions where the development contemplates grading on any natural slope that is 25 percent or greater.

While we added the definition for parking lots, at the outset we did not make it clear that we were talking about commercial standalone parking lots between 25 and 200 spaces in size. Not all parking areas for commercial facilities and -- rather not all parking for commercial facilities under 100,000 square feet in size.

We also were unclear on setting the threshold for when a redevelopment project would have SUSMPs applied. We now have added a threshold of 50 percent of impervious surface addition or the making of improvements to 50 percent or more of the existing structure as the threshold for SUSMP conditions to apply.

The term environmentally sensitive area means different things to different people and agencies. We've limited our definition to the one adopted by the board for the city of Long Beach storm water permit.

This definition limits the areas to those identified by the county of Los Angeles, the State Water Resources Control Board and the California Resources Agency. Referenced documents have been included.

We have made a number of less significant changes in the document that are identified in the change sheet, and I will address them only if you wish clarification. I probably will have to ask the neighbors surrounding the community to help the matter here as well.

R0071930

As noted above, we have a waiver provision that has sparked opposition. The intention was to add

flexibility and creative mechanism for funding regional projects with the funds that would be saved by not installing BMPs at a given site.

However, the waiver is controversial because it does provide an out from the SUSMP requirements. Ultimately you will need to provide guidance on the propriety and appropriateness of that waiver.

Now, let's turn to the numerical design standards which has been and remains the principal focus of comments. The fundamental notion is that, if you install a BMP as part of a new development, it ought to be of an adequate size that it can be effective. That's the basic concept.

Last April you approved a resolution adopting a set of BMPs that should be used in development activities. You also said that they should be the most effective BMPs. Effectiveness is largely determined by size and degree of maintenance.

If a BMP is large enough, it could manage all the runoff generated from the largest measured storm event, and we certainly are not proposing that today. However, if it is too small, it will be less effective and perhaps ineffective for all but the smallest rain events.

We do not specify the degree to which a BMP should remove pollutants. Rather, we have proposed an amount of rainfall that a BMP should be able to manage

thereby resulting in the removal of a reasonable amount of pollutants.

The 0.75 inch standard is proposed and since will provide coverage by a BMP for 100 percent of the volume of 85 percent of the storm events.

It will rain more than .75 inches. And our proposal will not address the volume of rain that's over that amount. But we do not believe it necessary to do so to effect a considerable reduction in polluted runoff.

Most pollution is picked up in the earliest phase of a rain event. By addressing the first part of runoff, and most of the runoff, most of the time, through BMP sized to that standard, we will make a significant difference in runoff water quality.

As I noted earlier, we are talking about a relatively small amount of land for the early years. While the overall impact will be difficult to notice early on, the payoff is really for the next generation who will have a much more intrinsically cleaner environment.

Think of it as a milestone that the Regional Board in 50 years will mark as the highlight of millennial foresight. The proposal has included two exemptions that we believe are reasonable.

First is the rooftop runoff exemption. The concept here is simple. Runoff from rooftops is less polluting than runoff that traverses streets picking up oil or passing through lawns picking up what people

didn't.

If you don't need to run this cleaner water through a BMP, the BMP that you have can be smaller and cheaper to build and maintain. This rooftop exemption may not work in all cases. Where the roof itself is shown to be inherently polluting, it is excluded.

Where the rooftops has vents or air pollution control systems that may result in a residue on the roof that can then be washed off during a rain, it's excluded. If the runoff from the roof is not channeled away from the ground surface so it can pick up pollutants, there is no exemption.

Finally, if the rooftop runoff is diverted to a stream that is natural, there's no exemption. These criterias seem to make sense. NRDC in their comment letter challenges the rooftop exemption but then cannot cite a study to show that the rooftop runoff would pose a water quality problem. And indeed they acknowledge the studies are indeed underway.

It would be inappropriate to require BMPs for rooftop runoff without a clear showing that the runoff from rooftops is a substantial portion of the storm water pollution problem.

Right now we don't know. And the proposal is flexible enough to allow the numerical standard to apply once a showing is made that there is indeed a problem to be addressed.

R0071933

The other exemption from the 0.75 inch

standard is for restaurants that are less than 5,000 square feet in size. The intent is to preclude applicability of the numerical design criteria to many restaurants that are small businesses in urbanized areas while still applying the basic SUSMP package to them.

Larger standalone restaurants or those located in a commercial complex will generally be covered by exceeding the 5,000 square foot criteria or by their placement in a commercial complex that is larger than 100,000 square feet in size.

While we have proposed a 0.75 inch standard applicable to all the SUSMP development categories, the board may wish to consider some alternative to what staff has proposed. Between the 0.75 standard and no standard, there are many options.

First, the board could impose a more stringent number than 0.75 inches. One inch or more could be imposed. Alternatively, a lesser number could be chosen, for example, 0.5 inches or even a third of an inch.

No numerical standard could be adopted leaving the standard being the most effective BMP, a judgment call rather than a measurable, quantifiable and ultimately verifiable standard. **R0071934**

A standard could be required immediately or phased in over time. The standard could be applied to only a few categories now and applied to more on the basis of more information at a later time. Perhaps tied

in with consideration of the next Municipal Storm Water Permit review which is scheduled for July 2001.

The county of Los Angeles has adopted a 0.75 inch standard as a result of litigation with NRDC. In their letter, the county's letter, of January 11 at page 11-90 in the comment binder, the county argues caution in moving too fast with a SUSMP proposal given their own difficulty in implementation.

The county's cautionary comments suggest that the board should carefully consider their problems, the county's problems, with implementation.

Another issue that we have not yet addressed is that of a cost trigger. By that I mean there is an upper limit as to how much of a project's total cost that should be spent on BMPs. These costs vary substantially based on the BMP selection.

It may be worthwhile for the board to consider some value beyond which additional SUSMP expenditures or BMP expenditures would not be required based on some cost factor expressed perhaps a percentage of the project's total cost.

With this proposal, we have tried to advance the cause of storm water pollution control. I'm confident that, whatever the board's action today, we have already sent a strong message that the time for a concerted effort to address storm water pollution is now.

We have already seen substantial progress by cities to informally apply the 0.75 inch numerical

standard and in other instances to establish storm water management programs that go beyond the basics.

We are on the right track with this proposal although I believe there is ample room to fine tune the proposal to make it either more comprehensive or to instill greater flexibility. Either way, the goal of improving storm water quality will be achieved.

Now, finally I would like to just comment very quickly on the fact that I participated in a hearing yesterday before the city council for the city of Los Angeles.

And I testified on behalf of a resolution that was offered by city councilwoman Ruth Galanter and cosponsored by Mike Fuehr. And that proposal was to support the concept of the numerical standard that the board is considering today.

And in your materials that we provided to you today in the brown envelopes, I believe, at page 11-51 A-6 and 7, you have the resolution, at least a draft of it, that was offered and subsequently approved by the city council for the city of Los Angeles on a unanimous vote.

In addition, the city of West Hollywood recently sent us a letter which identifies -- that's located at 11153, A-8 also supporting the resolution that's before you.

So with that, I would like to turn the podium over to Dr. Xavier Swamikannu, who will comment

briefly on several issues including BMP costs and a bit more detail on how the 0.75 inch numerical was designed and standard is applied.

And he will be followed, I hope, by Jorge Leon, who will comment on a few legal issues. And after that, we'll respond to all comments that you have regarding to staff.

MR. SWAMIKANNU: Thank you, Dennis. Mr. Chairman and members of the board, I'm going to cover the most controversial aspect of the SUSMPs which is the numerical mitigation standard.

Basically, we have provided four approaches for reasons of flexibility. The one that's most known to everyone is a three quarters of an inch over 24 RP. But the primary method is what's called a maximized volume capture which is a recommended method by the American Society of Civil Engineers and the Water Environment Federation.

And what that does is that relates rainfall to runoff. So you're actually addressing runoff, not regular rainfall. The three quarters of an inch standard is focused on rainfall.

If you look at all these four approaches, the variation is 10 percent, which is within the norm. Some commenters have addressed the fact that some of these BMPs might be more sensitive to flow than volume.

Given the fact that we have traditionally looked at water quantity from a flood control

perspective, there is not geographical information or data to really evaluate flow sensitive BMPs at this time. So there's no specific recommendation to address flow sensitive benchmarks and (inaudible).

As I indicated, the primary method is based on the water and volume and federation recommendation. And it relates rainfall to runoff, and the formula I have before you is -- basically includes those variables. For coastal California what does that mean? It means depending on the surface area, that is impervious.

That the range could be anywhere between point one two inch and point eight six inches. So if there's less impervious space, you get the benefit of having to create less runoff. In Los Angeles it might not make that much of a difference because much of the urban area stay there.

The principal of the three quarters of an inch approach is basically the extreme events. That means heavy rainfall events are rare. And if you look over a long-term, that it's the smaller events that really matter.

And on a cumulative basis if you look at the graph, on the left side, as where the peaks are, what that's telling you is that most of the volume of rainfall over a long period is from the smaller rain events.

What does that mean? What does a three quarters of an inch mean? It basically means that we have an average for Los Angeles that, if you raise that

number, the benefit and the costs associated with building larger BMPs is minimal. That 85 percent of rainfall events equal to a less than a three quarters of an inch are addressed.

First flash which EPA indicates generally is half an inch is also addressed. And then if you do a relationship between pollutants loads and this volume that's treated by three quarters of an inch, you tend to address between, I would say, 50 and 85 percent of a pollutant load over a long-term period.

The three quarters of an inch is technically defensible. We did not have the Water Environment Federation recommendation five years ago. We have it now.

The three quarters of an inch is based on local data, and it uses a nationally accepted method to do the translation. Similar criteria are in use by other communities, and the range is anywhere between half an inch and two inches.

And we have similar criteria in this region itself. Santa Monica, Calabasas, Ventura county and unincorporated L.A. County use a similar number.

The issue of cost always comes up. How much would the design standard impose on communities? If the graph before you looks at the relative costs of different BMPs size to address storm water, the highest graph is for flood control and then you have for combined and sewer operations. You have for sediment control

You have a standard from Seattle and then you have one locally.

And if you look at the different ranges, the proposed three quarters of an inch is much less than many of the other criteria that have been used to address storm water.

I work with the city of Los Angeles staff to run through some calculations on an actual project. It's a five acre commercial development project. The project costs 6.5 million. We used a detention basin best management practices and looked at the different costs.

The excavation and hall away from the sediment from the detention basin 12,817. The land cost was during 9,000. Maintenance at one year. Maintaining it once a year $33.00. Total cost at about 42,000. If you relate that to the project cost, that's .6 percent.

Another BMP for the same project. You look at an infiltration trench and a vegetated swale combination. The land cost is minimal because it goes into part of the landscaping. Maintenance, five-year replacement of the vegetated swale as well as the trench.

If you work out the cost, again, this is less than .5 percent. We also looked at cash basin inserts, and that works out to much less. So preliminary analysis on the actual project indicates that the cost is not going to be that much.

R0071940

The numerical center that we have provides

flexibility in the choice of BMPs. You can choose a detention basin or you can choose vegetation swale. The mitigation cost is not likely to exceed environmental mitigation reasonable cost threshold which is usually about 5 percent of the project cost.

And for the BMP choice is to be made on how effective these BMPs are for the particular situation, and definitely the BMP charge maintenance or the ease of maintenance as one of those calculations.

That's the end of my presentation, and Jorge might address some legal questions.

MR. LEON: Mr. Chairman, good morning. Board members, good morning. Jorge Leon, Regional Board counsel with the office of chief counsel. I was just jotting down a couple of notes as Xavier was speaking about some of the issues that you might want to hear about.

What I'm going to propose is to just give you a quick overview of some of the legal issues, and I think it's -- going too fast?

COURT REPORTER: Slow down a little bit.

MR. LEON: For now and then I would propose to follow up on some of the specific legal issues that might arise during the parties' presentations a little bit later.

In other words, I think it would be helpful for you to understand the issues if, as the issues are raised, if I could have a response opportunity during

this staff response. It's up to you. Okay.

For now, I wanted to point out that several of the legal issues that had been raised including the appropriateness of the process that is being followed here today, whether CEQA has been complied with, what limits exist on the Regional Board's authorities and such questions as those in general have been responded to in the staff report and record of decision which is in the agenda of material at section 8 on page 14.

And a couple of other issues that are sort of noteworthy at this point involve the implication of the SUSMP provisions to discretionary versus nondiscretionary projects, and I wanted to talk a little bit about that.

The question is whether the board has or -- rather I guess it should be stated this way. Whether the executive officers' discretion which is at issue in the SUSMP proposal today ought to include discretionary or nondiscretionary projects.

The permit that is the basis of the action today of course is the storm water permit, the municipal permit 96 054. That permit speaks only of nondiscretionary projects. But it also does include some specified enumerated areas where storm controls need to be placed.

So first let me say that it's my belief that, since the permit speaks of the application of the SUSMP proposal to discretionary projects, that we're

stuck. That that's what we ought to interpret today's proposal to apply to, the discretionary projects, not the nondiscretionary projects.

However, where a nondiscretionary project is also a enumerated project, it's my belief that, because the entire philosophy of the permit was to address identified areas and those would be the enumerated areas were actual storm water issues, pollution have been found to be reliably present need to be addressed.

It's my recommendation that you apply the SUSMP proposal to those enumerated activities whether or not they are discretionary or nondiscretionary.

That would apply a more liberalized approach to the interpretation of the SUSMP application. If there are any other specific issues that you would like for me to address, I would like to try to do that now. Otherwise I'll be seated and await your call as the issues arise.

CHAIRMAN NAHAI: I'm sure there will be some legal language changes or questions on the body of the permit and then we'll give that to you.

MR. DICKERSON: Mr. Chairman, that concludes the staff presentation.

CHAIRMAN NAHAI: Do we have any questions from staff?

MS. LYON: Yes, I have. I had some questions about the hearing you went to yesterday at

Los Angeles City Council. How many council members were present?

MR. DICKERSON: I think it was 13.

MS. LYON: Was there a Public Works corrector there?

MR. DICKERSON: There was no one who spoke at the hearing, but there was a Public Works -- well, it's actually the Bureau of Sanitation. Their deputy director was present but did not testify.

MS. LYON: I find it a little hard to believe that those council members were fully informed of everything that was going on before they took their vote. So I'm not putting a whole lot of thought into the resolution.

MS. DIAMOND: I have a question. Some of the definitions are still not entirely clear to me. For example, on -- you describe the parking lot definition and the changes that were made.

Given -- would you give me an example of a parking lot that would be covered and a parking lot that would not be covered?

MR. DICKERSON: Yes. A parking lot -- the concept that we were trying to do by this specific parking lot designation was -- let's take for example a parking lot that was going to be opened up at Burbank Airport, and it's a paid for parking. It's specifically just for parking. That's what the parcel is all about. And it's not associated with a mini-mall, for example.

It's the distinction between parking which is solely for a -- solely on its own versus as part of a development. Because the distinction is that, if you have a 100,000 square foot commercial development, all the parking associated with that is going to be covered.

What we want to do is bring down that level to address strictly parking lot activities for those commercial -- excuse me. For those venues where it's strictly parking only.

MS. DIAMOND: So then it wouldn't cover a parking lot, for example, of a market that had 25 spaces or more people --

MR. DICKERSON: That's correct.

MS. DIAMOND: -- coming in and out all day or that's sort of --

MR. DICKERSON: That's correct. However, I'm certainly -- the whole point of today is really to get direction from the board as to what you think is appropriate to include if you all collectively think that it should be applied more broadly or not at all. I fully intend to follow that direction.

MS. DIAMOND: I have a couple of other questions related to the definitions. For example, retail gasoline outlets. If they're one or two pumps, but perhaps they do something beyond automotive work, they are not covered unless 50 percent or more is related to automotive gasoline repair, et cetera; is that correct? Or is that only the numeric standard?

MR. SWAMIKANNU: The retail gasoline outlet definition is basically defined to include the term what does primary mean? And here we basically use the standard industrial classification which is a federal designation of what the activity is.

And so for gas stations basically are correct. It's the numerical threshold that would not apply where there are less.

MS. DIAMOND: So the BMPs would apply, but the merit would not apply.

MR. SWAMIKANNU: Yes. Correct.

MS. DIAMOND: One other question I have would be about the restaurants. Those restaurants that are under 5,000 square feet, the smaller restaurants, I wonder if there's any way you can tell us how many restaurants in Los Angeles, for example, or in the region would that include?

We have Mc Donald's and Burger King. Lots of small restaurants all over. Is this a majority of the restaurants? Is this a small number of restaurants? It's important for me to know what percentage of restaurants are we not including in this proposal?

MR. SWAMIKANNU: It will be difficult for me to give you that number right now. But I think the 5,000 square feet basically comes from the practice around the country where do they cut out the threshold.

The concept here is that, when it's 5,000 or less, it's a smaller restaurant. And many of the BMPs

that are associated would be sufficient, and the numerical mitigation standard would not be appropriate for the smaller ones. But in terms of what number, I do not know.

MR. DICKERSON: We are --

MS. CLOKE: But they are required to have the BMPs even if they don't have the numerical standards --

MR. DICKERSON: Yes.

MS. CLOKE: -- no matter what size they are.

MR. DICKERSON: Remember the basic SUSMPs apply to all the categories all the time. With regard to the restaurant issue, the -- most restaurants now that are part of new developments are part of major complexes. And so in most cases those are going to be covered through the 100,000 square foot commercial development category.

What we're really trying to avoid here was to impose a requirement on a -- just because it's a restaurant, if they're going through a major redevelopment in an already substantially urbanized area where they would perhaps really have some problems putting in BMPs, that's the typical example that we were trying to avoid and perhaps a standalone kind of restaurant.

But I think we're finding that those are going to be -- most of the development is going to

capture the larger restaurants, I think. The numerical standard is probably going to apply to many is my feeling except for those which we've identified.

MS. DIAMOND: I have one last question, and that was on the rooftops. I know there are exemptions to the rooftop exclusion. But how -- the problem that I have with it is that we're talking about storm water being a problem because of all the paving that we have and the impervious surfaces in the region.

It seems to me that rooftops is another example of paving or impervious surfaces. Doesn't that include -- shouldn't that be considered, and what was the rationale for eliminating that or excluding it?

MR. DICKERSON: If you're talking about pavement, you're talking generally about places where cars are driving, which are dripping oil, which are subject to litter, which are subject to just people generating all different kinds of pollution.

When it rains and flows over that area, you can pick up additional pollutants. If there were no cars, if there were no people and you have paving, you probably have clean water running off even though it was developed or at least to a large degree.

The notion with the runoff from the rooftops is that, if it's running off a roof and there's no added pollutants from that roof, then why mix relatively cleaner water with relatively more polluted water which is just going to require your BMP to be

larger, more costly, more costly to maintain in the long-term, when you have don't have a very substantive solid base of information to include that runoff at this time?

The proposal does allow for a determination at some point in the future when studies come in, and I already see reference studies are underway. If those studies show that aerial deposition, for example, is causing a substantial contribution to the storm water runoff problems, it can be included at that time.

It's really a question of do we have enough evidence about the water quality if you differentiate it from the roof and from what's flowing over, let's say, a parking lot.

Do we have enough information to bifurcate that and to say that one is relatively more polluting than the other. We don't have a lot of good information right now. But we do have common sense that tells you that the rooftop runoff ought to be a lot less polluting if you don't have some of the same activities occurring obviously on the roof as you do on a parking lot. That's in essence the justification.

MR. SWAMIKANNU: Ms. Diamond, I want to correct a statement that I made. You asked me the question on retail gasoline outlets where if the receipts are less than 50 percent, do the other requirements apply.

R0071949

I think the answer is not. Basically what

we are saying the requirements are specific for retail gasoline outlets, and retail gasoline outlets are defined by the primary activity.

So if you have a big mall and there's a small pump on the side, the requirements don't apply. But what we have is in the model program, there's a priority category.

It's not -- we haven't specifically designated a business that -- where gas pumps are a subset of the activities. So the answer to your question is the requirements would not apply in that situation.

MS. DIAMOND: Thank you.

MR. COE: Yes. I have a series of questions, if I could. I'm looking at the plan, page 8, protects slopes and channels. As corrected, it says, "Project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slope channels from eroding" and so on.

It's page 8 on -- well, January 21 edition. Number 4, protects slopes and channels. What if it's not consistent with what the codes and ordinances -- what happens? Does that eliminate the BMPs or --

UNIDENTIFIED: We can't hear you in the back.

MR. COE: My question, was if it's not consistent with local codes and ordinances, one could say that the cities that change the codes and ordinances so they are consistent with BMPs. We're trying to get the

BMPs installed to correct the pollution problem.

MR. SWAMIKANNU: Mr. Coe, our understanding is that once the board approves this SUSMP and Dennis approves it as well, then the cities municipalities here would be required to adopt these through changes to their codes, ordinances. Whatever.

And once that happens, I would think then -- the BMPs that are required to address somewhat would be consistent with the local codes.

MR. COE: Well, I think that needs clarification, the language. I agree with what you just said was the right thing to do.

MR. SWAMIKANNU: And we have that statement somewhere as I can look at it for you.

MR. COE: Okay. Now, on the bottom of that page where we're talking about storm drain system, stenciling and signage, the second barrel, it says that we should have signs that discourage illegal dumping. This is a minor editing.

MS. CLOKE: Prohibiting.

MR. COE: Prohibiting illegal dumping, not discouraging it. We can't discourage murder. On page 10 on the section on maintenance, it's the maintenance actually starts on the bottom of page 9, item A, proper proof of ongoing BMP maintenance. There is -- several letters came in from primarily cities.

They were a little concerned about how this is all going to take place. And we have a very large

paragraph of a concept, but they're afraid that, after the original developer disappears from the scene and sells off the property and the houses, despite the written agreements and so on, that maybe those BMPs won't be maintained properly.

And I think it is a question perhaps for Jorge Leon. Is this the best we can do on maintenance?

MR. LEON: I don't think I have a good answer for that. I'm going to have to ask for Xavier's help. Your question specifically is one of practicability --

MR. COE: Exactly.

MR. LEON: -- of what we're requiring?

MR. COE: Exactly.

MR. LEON: Whether it's practical?

MR. COE: Right. Because if we don't maintain, then pollution will reoccur, and everybody will be looking at each other. It's better to have it very clear at the beginning. And I don't know what the answer is. But from a legal viewpoint, I was asking for your thoughts.

MR. LEON: At some point it does become an issue of enforcement by the municipalities, and maybe that's the answer. We can go so far as --

MR. COE: Take a look at it.

R0071952

MR. LEON: Oh, sure.

MR. COE: Okay. There's a couple weakies in there. I think we've -- in negotiating this we've

stepped back from time to time and weakened our position, and I marked it pink, and I got a lot of pink marks through here.

But I understand that sometimes that's necessary. But for instance, on page 10, Mrs. Cloke was asking it did I bring these out?

MR. LEON: Mr. Coe, these are for the audience's and for my clarification. When you are saying the page number, are you referring to the agenda page number versus the document page number? You see that there's one handwritten and then there's another page that's typed --

MR. COE: I'm looking at the typed page number.

MR. LEON: Thank you.

MR. COE: The 6th line there. This is why I'm a little concerned about this maintenance situation. That part that was added. The condition of transfer may include a provision.

Then on the last line of that paragraph it will also encourage the transfer of this information. I think we should go through and look at things that maybe have been too weakened. I'm on page 11.

CHAIRMAN NAHAI: If I may, Dr. Coe, let me just clarify for the record that what Dr. Coe is referring to is -- is a black line version of the Standard Urban Storm Water Mitigation Plan. At the bottom of it, it's designated final tentative and dated

R0071953

January 21, 2000.

MR. COE: Correct.

CHAIRMAN NAHAI: That is the version that we're looking at.

MS. CLOKE: Actually, it has the wrong date on it.

MR. DICKERSON: We should be using the December 7 version. That's in your binder.

MR. COE: Well, I'm looking at the latest, which is in the lower left hand corner, is dated January 21.

MS. CLOKE: And it says 1909 when it should say 2000 --

MR. DICKERSON: Let me just clarify. We sent a memo to you with that final markup just for your reference only and just so you know the audience does not have that version.

MS. CLOKE: We have no handouts of that in the back?

MR. DICKERSON: We have the December 7 version.

MS. CLOKE: This is what all of us --

MR. DICKERSON: It continues to change -- there's no difference between that -- what you have is everyone has a change sheet and the December 7 version, and it's basically the same.

R0071954

MR. COE: Well, maybe I can make my reference and then you can indicate the other reference

for the audience, if they're following.

MR. DICKERSON: Okay.

MR. COE: This is page 11 under 9-B, D.

MR. LEON: Mr. Coe, I'm sorry. I'm sorry to interrupt. Mr. Chairman, it occurs to me that there's an issue that I want to make sure is real clear in the record before we take it too much further concerning the versions that are out there.

Mr. Dickerson, I'd like to ask for your clarification. Because as I understand it, what we're dealing with here is two versions. The audience has a version that has typewritten pages and handwritten pages.

And it should say in the lower left corner December 7, 1999; is that correct?

MR. DICKERSON: Yes.

MR. LEON: That's the copy that was distributed?

MR. DICKERSON: That's --

MR. LEON: The board members have the version that's dated January 21 in that same location on the lower left, but it contains the identical information --

MR. DICKERSON: It contains the changes.

MR. LEON: -- except for the fact that the changes have been inserted.

MR. DICKERSON: That's correct.

MR. LEON: Those are the only changes.

MR. DICKERSON: That's correct.

R0071955

MR. LEON: Okay. So when you make a page reference, I wonder, Mr. Dickerson, then if you would then, please, refer to the page that the audience has.

MS. CLOKE: Mr. Leon, just to further clarify that ours is a strike-out version so that we can see what was taken out and what was added and --

MR. LEON: Yes. In other words --

MS. CLOKE: -- and ours does have the wrong date on it.

MR. LEON: In other words, yours --

MS. CLOKE: It should be noted that the correct year needs to --

MR. LEON: Oh, it's in '99?

MS. CLOKE: Yes. So that if somebody's looking at this in the record, they should have that information showing what document --

MR. LEON: In other words, the version that the board members have is the compilation of the same version that staff has with the change sheet marked into it.

MR. DICKERSON: Yes.

MR. LEON: And the staff -- I'm sorry. The public has the other version. They should have a change sheet separate from the December 7.

R0071956

MR. DICKERSON: Right.

MR. COE: Third time. You know where I am here on -- on small "D," the storm water conveyance system was not directly discharged to a natural stream or

a channel segment scheduled for restoration.

MR. DICKERSON: Yes. That's on page 9 of 17 of the December 7 version.

MR. COE: Thank you. Why do we have small --

MR. DICKERSON: The notion there is --

MR. COE: (Inaudible.)

MR. DICKERSON: This goes back to -- this goes back to the notion that most of our waterways in Los Angeles county have been channelized. And this is protection for those which are not yet channelized. Because the flow of the erosive quality of a higher velocity of the flow is the issue that we're trying to address there.

MR. COE: Thank you. Page 12, item 3, properly designed vehicle equipment wash areas.

MR. DICKERSON: Yes. That's page 10 and 17 of the December 7 version.

MR. COE: The second sentence says, "To alleviative" -- it's crossed out, I guess. No. I guess that's not -- maybe I crossed out. "To alleviate this problem consider including in the project plans an area" so and so and so and so.

That's one of those areas where I think it's very weak and subject to debate. If they don't do it, they'll say we don't have to do it. I'm on page 14.

MR. DICKERSON: Page 12 of 17 of the December 7 version.

MR. COE: Item E, parking lots.

MR. DICKERSON: Yes.

MR. COE: This has been discussed, but I'm still not clear on -- this has no mention of the 5,000 square foot limit there. It has to be 5,000 square feet or greater before this applies. There's no 5,000 in there, and there is a 5,000 in the resolution which the board will be considering later on.

MR. SWAMIKANNU: Mr. Coe, page 3 of your document basically talks about --

MR. COE: Page 3?

MR. SWAMIKANNU: Of the document that you have. 3 of -- whatever. Page 3 of the version you have.

MR. COE: I'm looking at it.

MR. SWAMIKANNU: If you look at the second paragraph, it says, "Regional Board executive officer has designated two additional categories." And it says, "one is location within environmentally sensitive area." And then the next one parking lots, commercial standalone parking lots 5,000 square feet or more.

MR. COE: Okay.

MR. SWAMIKANNU: So that's where we call out the application of the requirements.

MR. COE: Now, a follow-up question and really an important part of this is -- that seems very small to be -- do I understand that numerical limits don't apply but the best management practices do for parking lots 5,000 square feet?

MR. SWAMIKANNU: The parking lot --

MR. COE: Or somewhere did I see that it's only 5,000 square feet or larger if it's heavily traveled from an industrial activity? I read a lot of documents. But this doesn't have any of that in there, and this is the plan.

MR. SWAMIKANNU: Yes. Basically says 5,000 or more standalone which is where we are right now. Standalone parking lots 5,000 or greater.

MR. COE: I see -- from comments coming in, written comments from the outside, some of the cities believe that's much too small. It would put people out of business and hard to implement BMPs. What's the source of the 5,000?

MR. SWAMIKANNU: In the 1996 L.A. County fund permit issue, we have requirements already for parking lots with 25 spaces or greater. 25 spaces or greater translates to 5,000 square feet.

MR. COE: So you're using what the county has already adopted?

MR. SWAMIKANNU: Not -- the permit that we adopted, the Regional Board adopted for L.A. County in 1996 has requirements for parking lots with 25 spaces or greater. And so we have used the same threshold. 25 spaces translates to 5,000 square feet.

MR. COE: What is our response to the cities that say that's too small?

MR. SWAMIKANNU: We are trying to address

the water pollution issue, and some of the studies that have been conducted by some of our municipalities indicates that the level of pollution from parking lots of that size is a concern.

MR. COE: Okay. My last comment at this point is page 15, limitation on use of the infiltration BMPs.

MR. DICKERSON: Yes. Page 13 of 17 of December 7.

MR. COE: We say in the second paragraph there "A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic."

I believe Ventura county's comment, written comments, indicated that they were a little uncomfortable with that ten feet and recommended we say that infiltration BMP shouldn't be installed over unconfined groundwater basins or aquifers.

They're worried about, of course, contaminating the groundwater supply by having these pollutants infiltrate. I realize ten feet will -- of percolation will -- there is a natural filter and will remove certain things. But can you respond to their concern and perhaps mine?

R0071960

MR. SWAMIKANNU: The ten-feet depth separation comes from studies in Fresno where groundwater is a concern. I realize that, when it's unconfined, that

the language you proposed where infiltration BMP is not being encouraged is a further clarification that we can provide.

MR. COE: I missed the last words.

MR. SWAMIKANNU: For where it is an unconfined aquifer, the infiltration BMPs can be discouraged in that situation. But where it's a confined aquifer, ten feet separation is sufficient for the studies that we've seen.

MR. COE: We don't say that.

MR. SWAMIKANNU: We can add that language, if you want.

MR. COE: Thank you very much. That's the end of my comments. I'll adjourn at this time. Thank you.

CHAIRMAN NAHAI: Mr. Shaheen.

MR. SHAHEEN: Just a follow up to some of the economic examples that you had up on the board. I just wasn't sure of the two examples that you showed for cost to implement were hypothetical or if you have a wide range of data of the actual costs to implement?

MR. SWAMIKANNU: Mr. Shaheen, we basically took a project that was in the pipeline in the city of L.A. and used the three quarters of an inch to look at the different options of BMPs. The first detention basin is a capture option. The second, vegetative swales infiltrations options and then the use catch basin insert, which is a flow over, its option -- treatment

R0071961

option.

And we use basically accepted cost estimates which are normally used to make those judgments.

So it's not a hypothetical case. It's an actual case. The city initially had concerns with the standard and so they worked with me to go over the calculations.

And so those examples indicate that, based on the flexibility we have provided, the range is very reasonable in terms of cost. Less than .1 percent to about .6 percent.

MR. SHAHEEN: Thanks. One other question possibly for Dennis, I guess. Again, I heard the comment earlier about staff recourses and even with registered or licensed people that are implementing this, how do you see staff's role, I guess, from an educational standpoint and from the standpoint if these can be consistently applied to BMPs?

MR. DICKERSON: Well, the issue of implementation is always a critical one. And with regard to our staff being able to provide oversight of what's going on at the municipality level or the county level, it's certainly very limited.

We're able to do an -- an occasional -- and certainly maybe this year not even that -- annual review of what is being done in the cities for the storm water programs. And should this be adopted, we would be

reviewing the implementation of this at that time in the future.

At the city level, the whole notion of that proposal, to have it approved by a certified professional, was to allow the city to have a mechanism by which they would be able to avoid having their own staff or hire new staff to review independently that work but rather to rely upon a professional who is adequately familiar with the information to be able to certify that it does meet that standard.

CHAIRMAN NAHAI: Mr. Miller?

MR. MILLER: Dennis, I have a question.

MR. DICKERSON: Yes.

MR. MILLER: On a single-family tract home project, if you have a detention or retention basin, what do you do after all the houses are sold? Who maintains the basin?

MR. DICKERSON: That would be the -- if you're in a large housing complex, the notion is that you would have some sort of a covenant, set of agreements, homeowners association --

MR. MILLER: What if you don't have one?

MR. DICKERSON: If you don't have one.

MR. MILLER: Most single-family projects don't have one.

MR. DICKERSON: Oh, are -- the single families that would be applied are the hillside, and what other ones, Xavier?

MR. SWAMIKANNU: I think he's talking about developments in the single-family homes.

MR. DICKERSON: Okay. I'm thinking of a distinction between, let's say, once you get up into over, let's say, 25, 50 homes, you're probably beginning to look at some kind of an association.

MR. MILLER: Not necessarily what happens.

MR. SWAMIKANNU: I think the example to look at, Mr. Miller, is Ventura county. Basically given the BMP options that we have provided, you can sort of build it into the landscape like a lake, a detention basin built like a lake, and so it adds value to the whole property.

Ventura county basically has created a fund where the developer puts in a certain amount of money up front for perpetual maintenance. That's possible. We aren't dictating options here. But several communities have done it in different --

MR. MILLER: No. I'm just curious about what happens in a for sale project where there is no association and there never will be which is -- a majority of tract housing is done that way.

R0071964

MR. SWAMIKANNU: I think that -- given the options that we have provided, the municipalities have to find -- find the mechanics. We're trying to address water quality here. So there is a community benefit.

MR. MILLER: Can the municipality then be forced to take over the maintenance of these basins if

necessary if they are community property?

MR. SWAMIKANNU: I don't know if force is the right word. But just like roads that we put in in tract homes ultimately get transferred to the municipality, and so similar mechanisms have been tried because the municipality has a responsibility to the community. We are not dictating options here, but they have --

MR. MILLER: I was just thinking of a way to make it work.

MR. SWAMIKANNU: Right.

MS. LYON: Quick question. When you had your economic examples up there, you might want to refresh my memory again. Did you have any grading costs in there? Those are quite extensive.

MR. SWAMIKANNU: Ms. Lyon, I don't think I included grading costs. The costs were associated with the BMP that structured two to three quarters of an inch. So excavation of the detention basin all the way of the sediment but not the grading of the property which I would consider as part of the project costs.

MS. LYON: Well, only if they have to comply with some of these new rules would that even be necessary. So that is part of the cost of this too. And I would like you to look a little bit further into that.

MR. SWAMIKANNU: Okay. I will.

MS. LYON: Thank you.

R0071965

CHAIRMAN NAHAI: I had a series of

questions to ask. And I'll try not to bore anybody with them, but I do need to ask them. So -- and I'll refer also to the -- the black line, the strike-out version that the board has since that was the most recent one.

I also marked up the other one. This was the most recent one that I had.

So my first question concerns -- appears on page 3, and it has to do with the definition of the 100,000 square foot commercial development. I wanted to make sure that I understand what we mean by a commercial development.

I guess this would exclude hospitals, schools, governmental buildings. It would basically -- this is a reference basically to shopping centers and office buildings?

MR. SWAMIKANNU: Mr. Chairman, my understanding is that commercial is much broader than that. It's not specific to just office buildings or malls.

CHAIRMAN NAHAI: Would it include a hospital?

R0071966

MR. SWAMIKANNU: It should. In my interpretation I wasn't trying to be restrictive in that definition.

MR. DICKERSON: I recognize your point. It's clear that the definition, if it were to apply to those, would certainly need to have greater clarity.

CHAIRMAN NAHAI: Now, hospitals and schools

and other developments, were they listed -- are they listed in the county list of SUSMPs to which the numeric limit applies?

MR. DICKERSON: I believe that's the case although NRDC might be asked that question or the county representative might be asked that. We're getting to an interesting point, though, and that is whether or not the 96 permit has a definition of commercial because that seems to me the key determinate of whether or not we have an issue here.

It does not? Xavier says it does not. So at some point today the board will have to give us some direction as to what's included in a commercial development

CHAIRMAN NAHAI: Or perhaps there may have been some kind of interpretation of the term between 1996 and now in the context of the countywide permit anyway.

MR. DICKERSON: I think it's something that we're going to have to look at. It's a very good point.

CHAIRMAN NAHAI: My next question has to do with the definition of redevelopment on page 4 and does the 50 percent test that's -- that's being applied -- and I was trying to figure out exactly how that's going to work in practice.

Because it could mean, as I read it -- and correct me, please, if I'm wrong as I read it, it could mean that you could have a 300,000 square foot development that could add 140,000 square feet and not

fall subject to the regulations.

On the other hand, you could have, you know, a much smaller development which could fall prey to -- prey is not the right word. Which could -- that's for those of you who oppose it obviously and to show you how balanced we are in the way we look at things.

You know, which could fall subject to it. And yet when you take a look at what we're trying to do, which is to control urban runoff in the pollutant mode, that wouldn't be -- you know, from a policy point of view, it wouldn't work.

So I'm wondering whether it would be appropriate to take a look at this issue and perhaps, rather than have this 50 percent test, perhaps we could talk about the addition of square footage. And that way, if you have a much smaller project that's expanding but which isn't going to have, you know, a deleterious impact, we don't impose the regulations.

If you have a much larger project, that's going to expand substantially and should be part of it. It would, wouldn't that?

MR. DICKERSON: I think that makes a lot of sense. And in fact, my expectation coming into the meeting today is by the end of the day you would provide substantial improvement to this document, and you already are. Thank you.

CHAIRMAN NAHAI: Next question regarded the definition of a restaurant which is defined as a facility

that sells prepared foods and drinks for consumption. Would that include a market?

MR. SWAMIKANNU: By "facility," I would mean a separate entity that's geographically isolated. So to a market with many other functions would not fall under this category.

CHAIRMAN NAHAI: How do you fix that?

MR. SWAMIKANNU: Prepared foods, so not raw vegetables.

CHAIRMAN NAHAI: If I go to my market and I buy a Wolfgang Puck pizza, that's a prepared food. And it's ready to consume. So we say a separate facility? A standalone?

MR. SWAMIKANNU: I agree with that comment.

CHAIRMAN NAHAI: My next question regards -- we've got source BMPs, structural BMPs and treatment BMPs. And in a number of instances, there's a bit of a blurring of the lines between structural BMPs and treatment BMPs, as I understand it; am I right, Xavier?

R0071969

MR. SWAMIKANNU: Yes.

CHAIRMAN NAHAI: When we get into some of the meat of the document -- and I'm looking, for instance, at paragraph 8 and then this is on page 9 and 10. We keep talking about -- in some places we talk about structural or treatment control BMPs and yet in other places we only talk about treatment BMPs.

For instance, at the bottom of my page 9,

it talks about verification would include the developer signed statements accepting responsibility for all structural and treatment control BMPs. That's fine.

Yet when you get to the -- to the next page in the second paragraph, for instance, it talks about -- it says if treatment control BMPs are located within a public area proposed for transfer. And then in the next sentence, again, a reference to treatment control BMPs.

And in paragraph 9, again, a reference only to treatment control BMPs. And in 9-A post construction treatment control BMPs. And should we also view referring to construction BMPs as an alternative or not?

MR. SWAMIKANNU: Yeah. I think we should include both terms at the same time. The issue, as you pointed out, we have source control BMPs which are very clear.

Structural control BMPs, for example, a shed. It's a structure, but that's not a treatment control BMP. A detention basin is also a structural control BMP but also treatment control BMP. And so in order just to be clear, I think, wherever we have treatment, we should also say structural.

R0071970

CHAIRMAN NAHAI: Structural or --

MR. SWAMIKANNU: Or treatment.

CHAIRMAN NAHAI: Jorge, perhaps you would want to take a look at the definition of treatment control BMPs and see whether you can refer -- include a

reference to source control BMPs as somehow part of that definition. Whatever shorthand -- whatever is easier.

The next thing is I couldn't understand the change in 9 A-3, which is on page 10. The way it reads right now, it says, "The volume of runoff produced by a .75 inch storm event."

Now whereas previously it talked about the volume of runoff produced from any storm event up to and including .75. And why was the change made?

MR. SWAMIKANNU: The change was made for clarity, Mr. Chairman. When we're talking about design standards, so when you design something, you design it for a particular size, and it treats everything up to that.

There was no reason to use language even up to and including. But perhaps if you think I'm wrong, then I have to be willing to consider your explanation.

CHAIRMAN NAHAI: No. I'm -- the possibility -- the probability is I'm wrong. But as I read it, this, you know, just strictly it says that post construction treatment control BMP shall be designed to -- and then it says -- mitigate storm water runoff from -- then the volume of runoff produced by a 0.5 inch storm event. Now, storm event is a defined term.

R0071971

MR. SWAMIKANNU: Right.

CHAIRMAN NAHAI: And there has to be a 72 hour --

MR. SWAMIKANNU: 24 hours is how --

CHAIRMAN NAHAI: So but would this mean that, if there was a .5 storm event, for instance, that in that event the BMP -- it says it -- it's there to mitigate storm water runoff from the volume of runoff produced by a .75 inch storm event. What if it's a .65 storm event?

MR. SWAMIKANNU: I understand that comment. My explanation of that would be -- when you design standards, you design for a particular size, and that means everything up to that is treated.

Now, for legal reasons you might want to clarify it because someone might want to circumvent the lowest that -- it's possible that that might happen. So then we would go back to the original definition that is there right now which includes everything.

CHAIRMAN NAHAI: Okay. I understand. And you're saying that the design of the BMP will be designed in such a way as to take care of anything that --

MR. SWAMIKANNU: For example, you design a car for four people. That means three people can fit, two people can fit, one can fit. But in a situation you might -- somebody might design a car for -- I don't know how you design one for four people and not for two.

R0071972

CHAIRMAN NAHAI: Possibilities come to mind. Regarding the difficult issue of implementation and how one passes on, you know, responsibilities and so forth this is how I envision it or how I see it in my

mind's eye.

If there is a large subdivision in which there is a consolidation of the BMPs so there is a set number of BMPs that is setting -- that is serving a number of homes around it, just like there's a tennis court or there's some other kind of common area within the subdivision, then I think legally anything from four lots upwards has to have a homeowners association.

So I think that will -- and if it's not a part of a common subdivision in which there's a common interest subdivision, then in that case there would be individual BMPs on individual lots, and the issue becomes how does that pass on from generation to generation?

And you know, we have municipalities, have devices in terms of recorded covenants. For instance, covenants to hold the property as one parcel or covenants to maintain tandem parking or covenants to maintain clarifiers on properties or various other things.

And those are devices by which, you know, generations of the obligations have passed from owner to owner by virtue of recorded documentation. Of course there is an enforcement aspect that's involved in that. But there's an enforcement aspect in everything that is seen and done including, you know, enforcing the conditions of tentative maps and enforcing the conditions of globing permits and what else have you. **R0071973**

So have you given thought to this device, or has there been discussion with the municipalities

about the device of recorded covenants in order to pass on from buyer to buyer the maintenance aspects of whatever BMP is selected?

MR. DICKERSON: There hasn't been that much discussion. Most of the discussion with the city has really been focused on .75 inch issue, and this particular item, if I recall, is actually language for the most part submitted by the cities to us. And so there hasn't been an awful lot of detailed looking at it.

CHAIRMAN NAHAI: Basically then this would leave it up to the cities to decide what mechanism they want to use for that?

MR. DICKERSON: Yes.

CHAIRMAN NAHAI: I think -- hopefully my final issue, regarding the waiver, I mean I can well understand that there has to be a waiver mechanism because you can't bind everything that's going to happen here in the future.

But with respect to the second waiver, I'm on page 16 in paragraph 11 and in subparagraph "ii's," it talks about unfavorable or unstable soil conditions that --

MR. DICKERSON: You're on page 13 of 17 of December 7.

CHAIRMAN NAHAI: I'm on page 15.

MR. COE: 16.

CHAIRMAN NAHAI: I'm sorry. I'm just concerned about the language because read on its face, it

R0071974

would mean that, if the soil conditions are unsuitable for infiltration, for this -- for this one kind of BMP, that a waiver may be possible for the entire SUSMP requirement.

MR. SWAMIKANNU: The purpose of the waiver, as you indicated, is to provide a parallel option in that situation, but the situation you're describing is just because one BMP is not applicable does not mean you pick up the waiver as the first opportunity.

And so we can provide that clarification to exhaust the various BMP options before you take advantage of the waiver.

CHAIRMAN NAHAI: And then finally regarding this paragraph, this is a question for you then, Dennis. How do you -- do you believe you're going to be inundated with requests for waivers, and is this something that should be brought back before the board or dealt with in another way?

MR. DICKERSON: Everyone tells me that the executive officer position must be a glutton for punishment. So that may indeed be a concern. I think we have some language as well here that has modified that somewhat.

R0071975

MR. SWAMIKANNU: The modification we have suggested is that the petition be submitted by the permittee as opposed to the project proponent. So that sort of limits the burden on the executive officer.

And these petitions can come in during with

the annual report. It doesn't have to be contemporaneous. So I think we can sort of regulate in terms of how they submit it to us.

MR. DICKERSON: The whole notion behind it is really in order to provide additional flexibility so that you wouldn't have to come back and modify the permit to allow that to occur. If it needs work, we can certainly change it.

CHAIRMAN NAHAI: Final question I had was with respect to projects that are already in the pipeline so to speak, that are going through their CEQA process right now. Those are not going to be caught by what we're doing here; is that correct?

MR. DICKERSON: Right. We need some direction from the board as to a specific date at which these are going to come into play. And I had been thinking along the lines of a -- what has to happen to make these really effective is the cities need to go back and adopt ordinances.

And so you need to give a period of time for the cities to adopt that and complete that process and then to have a point in time when plans that are coming in need to meet the standard, and it seems fair that that would be at some point after the ordinances are adopted.

CHAIRMAN NAHAI: How much time do you contemplate for the ordinances to pick up?

R0071976

MR. DICKERSON: No more than six months.

CHAIRMAN NAHAI: And then how long after that for the SUSMP requirements to become effective?

MR. DICKERSON: I wouldn't say that very much time would be needed.

CHAIRMAN NAHAI: Would any time be needed or some time?

MR. DICKERSON: I'm open to testimony on that.

MS. CLOKE: I think I'd like to hear the testimony first, and I have a lot of comments. But I'd like -- maybe some of my questions will be answered as we go through -- I'd like to reserve my questions until I've heard the public testimony.

CHAIRMAN NAHAI: So what we will do now is we'll move onto the two 30-minute segments, and the board will hold its questions until the end of each 30-minute segment. Now, I'm told that we must break at 12:30?

MR. DICKERSON: Yes.

MR. SWAMIKANNU: Mr. Chairman, before you proceed, I seek a clarification from you, Mr. Chairman.

CHAIRMAN NAHAI: Yes.

MR. SWAMIKANNU: And the clarification is on the numerical mitigation standard. You express some concern with the modifications that we have suggested. For example, the volume of runoff produced from three quarters of an inch, that discussion. I didn't get direction from you. Was my explanation sufficient to satisfy your query?

CHAIRMAN NAHAI: You want me to reaffirm my bowing to your superior interpretation?

MR. SWAMIKANNU: No. Not at all. I just want clarification.

CHAIRMAN NAHAI: What you told me is that, if I knew a little bit more about engineering, I would have known that and -- you seem to forget your example of, you know, procedure cards and so forth. I thought I maintained a very dignified silence in response to that.

MR. COE: A love of knowledge is a dangerous thing.

(Paper change.)

CHAIRMAN NAHAI: We're going to move to our 30-minute section. And what I'm going to do is I will call out, you know, four names so that -- or three names so that at all times we'll have three people waiting to speak for ease of movement. And again, are you ready with your magical device there?

MS. CLOKE: Mr. Chair, can I just suggest that perhaps people knowing that in these two, 30-minute segments they may have an order in which they prefer to be called?

R0071978

CHAIRMAN NAHAI: Okay. So the first three would be David Beckman, Alex Helperin and Mark Gold.

MR. BECKMAN: Good morning, Mr. Chairman, members of the board. Thank you very much for allowing us to address you this morning on what we believe to be one of the single most important actions this board has

taken in its 50-year history, and we don't mean that as hyperbole. We mean it quite literally.

I'm going to introduce the presentation from environmental groups. There's a number of groups in addition to NRDC that will address you this morning, and collectively they represent over half a million people and at least 75,000 people in the Los Angeles area.

What I'd like to do, by way of introduction, is to ask and answer five simple questions which address the general points we'd like to begin our presentation with and give you some sense of a context of this proposal.

If we can go to the first slide, the first question is what's at issue, and in our estimation what is at issue, as I indicated, is one of the most critical actions you can take to control storm water pollutions.

Quite literally to cut to the chase storm water pollution in Los Angeles has the region by the tail. You do not as a Regional Water Board have control of the situation, and I hope you don't for a minute think you do.

Storm water pollution is the single largest source of water pollution in this region. That's true nationally, but it's especially bad in Southern California. What can you do? You can take the step of approving the SUSMP proposal but not as proposed by the executive officer today but like it was proposed in the fall before the executive officer inserted almost a dozen

exemptions, exceptions and loopholes that have turned this proposal from a terrific one into Swiss cheese.

There's so many holes in this thing that we don't believe, as it is proposed to you, that it would have much effect at all, much good effect at all.

Go to the next slide, please.

Why is it so important? What is the issue of storm water? As I indicated, it's a huge problem. But let's just look at some facts briefly. EPA has said that the L.A. region has one of the worst storm water problems in the country, not NRDC, not the BayKeeper, not Heal the Bay, but EPA.

Storm Water has increased depending on the pollutant of concern that you focus on between 200 and 700 percent in 20 years. That's out of control, I think, by anybody's estimation.

In L.A., although it's a small portion of the land area of California, has over 50 percent of the officially listed impaired water bodies in the state which is an embarrassing statistic. We hope you agree with that.

The next slide.

What's the role of development? Why are we focused on development? Well, simply put, development is one of the most essential accelerators of storm water pollutions and its denigration of environmental resources.

R0071980

As the next slide shows, the amount of

impervious surface is directly related to runoff and as a consequence to runoff pollution.

If you could just put the next slide up. Thank you.

This is a statistic from NRDC report that was published last year. Some of you saw it a few months ago. But it is very telling. A one-inch rain storm on a one-acre natural setting, produces about 200 cubic feet of runoff. If you just pave that same acre, it's 16 times as much.

That example over all of the acres in Southern California is the answer to the question why do we have such a particularly bad problem? If that amplification of runoff and the pollution that's associated with it in a hardscape. And that's why we're focused on development and redevelopment.

Next slide.

What's the answer? What are we to do about it? Well, what you should do about it, we would suggest, is put in place an effective development planning program that has three components, a description of scope, a list of BMPs to select and a numerical standard.

What's at issue here is one in three. What's the scope and what's the size. Mr. Chairman?

CHAIRMAN NAHAI: You're the first speaker, and you've gone over three minutes. If you can, can you --

R0071981

MR. BECKMAN: Okay. I will conclude.

CHAIRMAN NAHAI: Please.

MR. BECKMAN: The rest of the speakers will get into some of the details and amplify some of the remarks I've made and answer many of the questions that were posed to staff. And again, thank you very much for the opportunity to address you.

CHAIRMAN NAHAI: Thank you.

Mr. Helperin?

MR. HELPERIN: Good morning, Mr. Chairman. Alex Helperin, from the Natural Resources Defense Council as well. I want to just talk about the -- all of the various forms of support that there are for the numerical design standard that's been proposed today.

These sources of support range from experiences in other parts of the country to local experiences and local support, the scientific and technical data as well as the expert support for this standard.

Both EPA and also the California Coastal Commission, I would note, have also stated their support for the standard.

R0071982

Next slide, please.

Just to give you a sense for some of the municipalities around the country and how widespread similar or even more stringent standards are, this is from one study of 32 municipalities around the country. And every one of these municipalities has a standard much more stringent than the one that's being proposed here

today.

Many of these are entire states including hundreds of municipalities in and of themselves. You can see in the bold along the right-hand side all of these are in excess of an inch. And again, this is just from one study.

Next slide, please.

In addition, EPA noted that Phoenix, which has similar hydrology to Los Angeles, which was not in that study -- I would just like to point out -- also has a much more stringent standard than this one.

Some of the standards in different parts of the country are hard to compare because there are different ways to measure these. This just shows you a few also from that same limited study, a few additional municipalities but also have standards that are the vast majority of the time, more stringent than ours or than the one that's being proposed.

Next slide, please.

Here in Los Angeles, as you know, the Los Angeles county has already adopted a program which is more stringent than the one that you're proposing today.

It's broader in scope. There are over 20 different types of projects that are covered. It's not limited to discretionary projects, and the permit does not restrict you to covering discretionary projects. There is discussion of discretionary projects, but there's no such limitation --

COURT REPORTER: Slow down just a little bit.

MR. HELPERIN: -- as NRDC has mentioned in our letter. And furthermore, the county program does not include a host of exceptions that we feel plague this current program.

Next slide.

Just to show you some of the 20 or more than 20 programs that are covered by the county program, you'll see about two thirds of the way down hospitals which you ask about are covered by this program much more extensive than the current proposal.

R0071984

Next slide.

Additionally, there are many local municipalities that support this program. As you can see, I've listed some of them here. Some, for instance, Calabasas are again much stronger. There are many others that supported, as the Regional Board staff has noted, such as Arcadia and Baldwin Park that aren't on this list.

MS. LYON: There's an error on there.

MR. HELPERIN: And since consistency has been brought up as major concern as far back as when the Long Beach permit came up, Long Beach stated that they wanted to wait so that there was consistency in their requirements that applied across the board.

So this is a significant factor in addition to California Coastal Commission that has applied this

standard now throughout the coastal area.

CHAIRMAN NAHAI: Thank you.

MR. HELPERIN: There's just one other slide that you might want to look at.

CHAIRMAN NAHAI: If we need to look at it at the end of the program, show it to us then.

MR. GOLD: Good morning. My name is Mark Gold. I'm executive director of Heal the Bay. One point of clarification, the Coastal Commission actually adopted a very similar standard to apply to all development -- that gets coastal development permits and local coastal plan, local coastal plan amendments and the entire coastal zone of California. So I do want to make a clarification.

I'm going to speak specifically to the exemption and waivers. I'm not going to provide the background that David did already. As he said before, there's a wide open waiver provision. The self-certification program and the insidious addition of the conflicts with local priorities provisions basically creates Swiss cheese, as he said, of the entire provision.

R0071985

One major loophole after another for developers and cities to avoid complying with the numeric design standards requirement is what we have right now.

And remember that -- that the August draft contained no exceptions whatsoever. The focus I'm going to talk about is the rooftop exemption. As a member of

the EPA Urban Storm Water Federal Advisory Committee, I've witnessed nearly every controversial position recommendation on urban runoff.

No one even proposed a rooftop exemption for new and redevelopment. No city, county or state in the entire country has a rooftop exemption. I've seen no journal article mentioning or proposing a rooftop exemption.

EPA is opposed to the rooftop exemption. Why? Because it provides an incentive to bill from lot line to lot line. This is the exact opposite direction that we should be going in and also because dozens of studies contrary to what we've heard before have demonstrated that the percentage of impermeable area is directly related to water quality flow, pollutant loading and the health of the watershed.

The staff report provides no justification whatsoever for a rooftop exemption. Where the heck did this technically and environmentally undefensible standard come from?

Neither the opposing cities the building industry had made this recommendation prior to the December 7 draft SUSMP. Well, this arbitrary standard was created from whole cloth with no substantiation whatsoever by the executive officer.

R0071986

Whether it's the Center for Watershed Protection, academia, storm water engineers or the county's own monitoring program, increases and

impermeability are directly related to increases and flow and poor water quality and ecological health. This has been substantiated time and time again.

The rooftop exemption ignores the impermeability issue altogether. Look at Malibu Creek and lagoon where flow -- which is important as water quality.

Remember, storm water flows transport pollutants to receiving waters. EPA strongly opposes the rooftop exemption. So should you. This is the most important amendment that you can make to protect water quality today. Thank you.

CHAIRMAN NAHAI: Thank you so much for keeping to three minutes. I appreciate it. The next three cards are from Heather Hoecherl, Lisa Boyle and Steve Fleischli.

MS. HOECHERL: My name is Heather Hoecherl. I'm staff attorney with Heal the Bay. In addition to the exceptions noted by Dr. Gold just a second ago, the program scope is also fatally hindered by a host of exemptions and limiting definitions which render the current proposal virtually meaningless.

These exemptions and limiting definitions are arbitrary and overly restrictive. I'd like to highlight a few of these. And just a more reasonable approach, first, we agree with staff counsel's recommendation that the SUSMP requirement should be applied to all enumerated areas in the county permit

whether the program is discretionary or not.

The second, the staff has proposed a list of categories subject to the requirements, and this list is uninclusive of the list used by L.A. county in its storm water management program. For consistency, the board should adopt the same category list used by L.A. county.

Third, several restricted definitions profoundly limit the meaningfulness of coverage for the program. For example, the definition of retail gasoline outlet currently includes only facilities engaged in filling gasoline that drive more than 50 percent of annual gross receipts from the sale of gasoline. This is way too narrow.

The staff has not put forth a good rationale for this limit, and under this definition, if a successful mini-mart or Mc Donald's is attached to a gas station, not only will the design standard or the numerical design standard not apply, but none of the SUSMP requirements would apply.

The definition should be changed to include any commercial facility which includes a pumping station regardless of whether the station has an associated convenience store or fast-food restaurant connected.

Second, the current definition of hillside is unduly restricted.

R0071988

Show us the next slide.

The way it's written in the proposal, all

three of those requirements must exist or those characteristics in order for it to be defined as a hillside.

This is inconsistent with L.A. county program where any one of these three characteristics, if one of them is met, then it would qualify as a hillside. We suggest changing the "and" to an "or" as indicated on the slide.

And again, this definition limitation is troubling because these areas would be exempted from all SUSMP requirements, not just the numerical design requirements.

Third, the proposal currently excludes small restaurants under 5,000 square feet from the BMP sizing standard. However, there is no automatic correlation between the size of the restaurant and the amount of pollution generated. In fact, the small restaurant can produce much greater storm water pollution than a larger one.

We would get rid of that limitation. We would also suggest on the parking lots to get rid of the commercial standalone limitation. The county permit has requirements for all parking lots greater than 5,000 square feet or 25 spaces, and we think that this will be consistent with that and that way nothing will fall through the cracks.

R0071989

Finally, we disagree with the staff's changes to the definition of redevelopment. We urge the

board to drop the threshold triggers which were just added and go with the definition found in the December 7 proposal. Thank you.

CHAIRMAN NAHAI: Thank you very much.

MS. BOYLE: Hello. I'm Lisa Boyle with Heal the Bay. The proposed design standard is cost-effective. BMPs can be very inexpensive. No one can argue that a development would be unduly burdened by the addition of a $500 catch basin filter or a dry well or the direction of rain gutters to permeable surface.

EPA has extensively analyzed the cost of storm water BMPs in the 1999 study, which is part of the record. In this study, using EPA's cost analysis and even assuming 100 percent imperviousness, a one-half acre development would be required to spend between approximately $675 and $8,000 to construct and install a sufficiently sized structural storm water BMP or BMPs.

A ten-acre complex would be required to spend as little as $13,500 or, using the most expensive BMPs, as much as $161,000.

These amounts are very small. They are a very small percentage of the overall costs to develop lots of this size. And I also direct you to the Regional Board's staff report at page 3 which cites that studies on the economic impacts of watershed protection indicate that storm water quality management has a positive or at least neutral economic effect while greatly improving the quality of surface waters.

Implementation of the proposed design standard right here in Los Angeles county or in -- or even more protective standards in municipalities all across the country has proven that development is not impeded by these types of standards.

In fact, some of the fastest growing regions in this country, including the state of Florida and Phoenix, Arizona have found that development can and will flourish in place with these progressive storm water design standards.

BMPs have been proven to be highly effective if they're sized appropriately. There's an incredible wealth of data in professional literature and government studies substantiating the efficiency of BMPs in removing pollutants from storm water.

In fact, the Center for Watershed Protection has concluded that there's enough data to select specific BMP groups on the basis of their comparative ability to remove specific pollutants. But BMPs must be sized correctly to be effective.

For example, oil, water separators can become overwhelmed if they're undersized. Finally, this standard is one of the most cost-effective ways that you can reduce urban runoff.

Incorporating the standard into the design and development stage is so much cheaper than retrofitting or cleaning up away from the source, as we've seen, from costly contaminated sediment cleanups at

the mouths of storm drains.

In fact, contaminated sediment dredging and disposal can cost $100 per cubic yard. So we urge you to remember the cost of not taking this proposal.

CHAIRMAN NAHAI: Mr. Fleischli.

MR. FLEISCHLI: Good morning, Mr. Chairman and members of the board. My name is Steven Fleischli. I'm the executive director at the Santa Monica BayKeeper. I think you all have a general sense of why we're here today.

We're here today because of sufficient -- significant water quality impairments in Los Angeles. But why is this issue before the Regional Board. Why are you the ones who have to deal with this? And the reason is, because under the Federal Clean Water Act, you are required to reduce pollution -- or cities are required under direction from you to reduce pollution to the maximum extent practicable.

And that's what this is all about today. Is this the maximum extent practicable? We would certainly argue that it is. We can actually come up with -- and we have come up with numerous examples that show that there's much, much more that can be done on this.

.75 versus other cities that have done one inch, one, 1.2 inches certainly in terms of maximum extent, this is reasonable in terms of that interpretation. In terms of whether it's practical, I

think the economic information you've heard that's been corroborated by staff, that's been corroborated by experts around country clearly indicates that this is practical.

The record in this case is massive. There is so much support for what you can do today in addition to the MEP standard under the Clean Water Act. You have the authority, and your mission statement in fact is to protect and enhance the water quality in the Los Angeles region.

Protecting this at the source where it starts and enhancing the rivers by preventing this pollution in the first instance is a meaningful step.

In terms of the record, you can do the next -- next slide. Actually, I'm sorry. In terms of the record, again, massive here. We have experts that support this standard from Tom Schueler from the Center for Watershed Protection, Dr. Richard Horner, Dr. Michael Strenstrom.

These people have written more materials on this than I can guarantee you the city is ever going to come up here and oppose this have even bothered to read.

And instead of looking at the evidence that's out there, all they're doing is looking for excuses today.

In terms of what's happening, some people will say that this is an effluent limit. It's not an effluent limit. It's a design standard, and what it does

is allows people and engineers to size these things properly. That's all it does.

An effluent limit would say you can only have .1 milligrams of lead run off your site. That's not what this proposes. But you clearly would have the authority to take that additional step.

The 9th Circuit has upheld that under Friends of the Earth versus Browner. It just came down last fall.

Next slide, please.

I guess the fundamental issue today is -- and for those of you who may have seen the article in the L.A. Times, based on what David Beckman has said this morning, is this is your opportunity to leave the legacy today. You can do that if you take out some of these exemptions.

Rooftop exemptions, it's absurd. You need to think about water quality and water quantity, and the Supreme Court has said in Jefferson County Public Utility District that the Clean Water Act allows you to look at water quantity and the impacts that that had on our waterways.

R0071994

And when you think about the L.A. River, when you think about Ballona Creek and those waterways, it's not just water quality. It's water quantity that has resulted in the paving over those rivers in the first place and the inability of us to meet our flood control requirements. So I will leave it at that. Thank you

very much.

CHAIRMAN NAHAI: Next cards I have are for Andy Lipkis, Beverly Winter and Terry Tamminen.

MR. LIPKIS: Do you have a clock that I'm watching up there?

MS. GOODMAN: The yellow, one minute left and --

MR. LIPKIS: Great. Thanks. My name is Andy Lipkis. I'm president of Tree People, a 15,000, member, 26-year-old local environmental organization.

I'm here to support the proposed and also push to remove the exemptions. What I'm really here to do today is to tell you this is feasible, and it's easy. It's understandable that people are scared because it seems new to Southern California.

But as you've heard, these ideas have been implemented all around the country. Specifically, though, there's an opportunity, as you've heard, to solve water quality issues but other significant issues facing Southern California including water supply, water conservation.

Because of that, Tree People launched a five-year effort, million dollar study, to prove economic feasibility and technical feasibility of doing just this. Actually, we set out not for three quarters of an inch but to trap 130-year storm on each land use in Los Angeles and show that you could retrofit sites, not just do it with new construction and still have it be

economically feasible.

130-year storm is ten inches in 24 hours. Sites can do that. We're not talking about something that's very difficult here. The partnerhsip that we brought together to make this happen included the United States Forest Service, the EPA, the L.A. Department of Water and Power, the city of Los Angeles, county of Los Angeles Public Works, city of Santa Monica, SCAG, Environment Now and numerous other agencies.

What we did was bring together leading engineers, architects, landscape architects, foresters, hydrologists from around the country. They spent four days designing retrofits and BMPs for L.A. sites. We have a book full.

What we did was take one of them, a set of them, and we retrofit a home in South Central Los Angeles. It functioned beautifully. We created a flash flood just recessing the lawns, putting in water capture devices. What it did was enhance the home, made it water safe, flood safe and especially protected the bay.

We also conducted a two-year cost benefit analysis with 200 local agency scientists and economists that backs up our data. We can provide that for you.

In addition to single-family home, we've retrofit schools. We're right now in the construction of two schools. One we're taking and making unpermeable surfaces permeable and handling flood water and storm

water from a parking lot.

Another school near L.A.X. we're putting in a 800,000 gallon cistern collecting, treating the polluted storm water from the whole campus and parking lot and using it to water the campus, replacing portered water.

Volume is a really critical issue, and we urge you to keep rooftop water in the mix because you need those volumes to help justify some of the costs of the BMPs.

You can easily handle entrenching and infiltration BMPs without the rooftop. If you add the rooftop, you add a lot of value that winds up helping the developer, helping the local homeowner because you're adding the water supply.

The results of this project are properties that are more attractive, making this more viable. Go for it.

CHAIRMAN NAHAI: Thank you very much.

MR. LIPKIS: I've got materials you can read.

R0071997

MR. LEON: Real quick housekeeping matter. A lot of the folks have provided slide presentations, just a couple slides they've put up. For the record of this proceeding, I would like for you to instruct the people who have presented slides and those who may present slides, they need to provide a copy for us whether it's a slide that they have now or whether they

can provide a copy in the hard version by the end of the week or something.

We need those things in the record of this matter and --

CHAIRMAN NAHAI: If they want it to be part of the record or they should do it in any event?

MR. LEON: Well, they should do it in any event because by putting it in front of you, you're necessarily going to consider it.

CHAIRMAN NAHAI: Does anybody need me to repeat that? Thank you. Ms. Winter.

MS. WINTER: Chairman, members of the board, my name in Melanie Winter. I'm the executive director of Friends of the Los Angeles River. And we're here to support the proposed plan without amendments and to talk a little bit about taking further from Mr. Lipkis' proposal a specific instance again of a brand new development that we had some experience in working with.

In 1998, Friends of the Los Angeles River entered into a mitigation agreement on a particular site development along the Los Angeles River at Taylor Yard.

This is a large 50-acre parcel that had never been developed. It had been dirt since God. And they were about to put on a large business park on this site. We were concerned not only with the quality from the runoff but water quantity because we're concerned about the river.

Fortunately for us the development company's president is an avid surfer and quickly understood our concerns. We began to work together on how to solve this.

Our consultants work jointly with their engineering staff to develop a drainage plan which ultimately would retain and detain surface water runoff and would remediate the water runoff.

And this plan was designed so as not to increase peak flows of surface water runoff also in a hundred year storm event.

These facilities were designed over a course of several months in working with these engineers. It was a challenging experience because it's a lot of new methods for the engineers, but it was very rewarding.

In the end, the systems were designed to -- we designed a system in the parking lot area largely. We considered a number of BMPs, including rooftop storage.

We chose from a menu of several implementing pieces of each and designed a system that incorporated bioswales, permeable surfaces and 18-inch perforated pipe subdrainage system. And sort of -- we called it BMP and weir system in the parking lot that allowed for greater percolation.

R0071999

Additionally, the storm drain's improvements designed to capture storm water runoff -- a half inch storm every 24 hours and to maintain 100-year

storm on-site. The latter was accomplished through a detention which over time it allowed percolation.

This was a large stop. These measures did not increase their costs. These costs were not increased. They were reallocated, and we all firmly believe that we could have gone for a full-inch event had we not agreed initially to not increase their projected costs at all because of the costs associated with the initial legal discussions and the six-month redesign at the site.

I think much of the resistance of the building industry seems to stem -- the fear seems to stem from the cost increase or that these are changes and that permits will be too hard to gain. We did have some initial hesitation in the permitting process, but these were quickly overcome.

And I think that with each new development, it will be easier and easier. And it's become a new standard. I think that developers need to follow legacy's lead. Change is impossible. It's critical. We need to not only keep the water clean but reduce the volume as well. We can accomplish both here.

MR. TAMMINEN: Good morning, members of the board. My name is Terry Tamminen. I'm the executive director of Environment Now and a board member of the Santa Monica BayKeeper.

R0072000

I had some remarks prepared here that would summarize the presentation you've just heard by the

environmental advocates, and I'm not going to use these because I think you have heard in great detail and much more articulately everything that I could have said to you in summary.

So instead, I'm going to provide you with a little historical context and ask you a question. And the question is this: Is this Regional Water Board prepared to have the heart and the wisdom and the intelligence and the foresight to do what all of its predecessors have failed to do?

That's the basic question. And I put it in this historical context for you because most of you are new, even those of you that have been here a little longer, other than Ms. Lyon and Mr. Coe, have not been here for more than a couple of years and certainly not even our executive officer were here ten years ago when many of us started trying to reduce storm water pollution using Municipal Storm Water Permits and State Industrial Storm Water Permits and construction permits.

And we came in front of the Regional Water Board, and we asked for help, and we got a deaf ear. So instead some of us had to sue some of the cities to establish these standards. Not a happy prospect for any of the participants.

Again, we came back, and we asked for help. When it came to Caltrans, for example, under the Municipal Storm Water Permit and their responsibilities, to the county, especially with regard to the monitoring

components of the Storm Water Municipal Plan, which obviously the monitoring is what tells you whether or not these efforts are working. And again, the Regional Water Board turned a deaf ear.

So again, the advocates had to sue and had to get these standards implemented in other ways. We've done it time and again for everything from auto wrecking junkyards to ports and municipalities. Time and time again come in front of the Regional Board and said, "This is your opportunity to do something to avoid future conflict. Help us." And instead we got a deaf ear.

So we're back today. Now, the previous boards, maybe they had a bit of an excuse because what was their answer time and again? "Well, we haven't tried the cooperative process long enough. We haven't sat around the table long enough. We haven't held hands long enough. We haven't sung Kumbaya loud enough."

But now ten years later, we have done all of that. So I repeat my question to you. Will this water board, the administration of Chairman Nahai, will this water board have the courage and have the wisdom and the foresight to take the actions required to adopt this resolution the way it was proposed in the fall without all the exemptions and the loopholes? R0072002

Make it clear. I got to tell you in every one of the cases, when I've been across the table from a defendant, they all say, "But look. If I do the things you're asking me to do, how do I know that gives me final

peace without numerical standards, without definitive standards, how do I know?"

And my answer is "You know what? You don't know." So this is your opportunity to do something not only for the environment and the environmental advocates standing in front of you here today but for the regulated community. Have the wisdom. Have the courage, and have the heart.

CHAIRMAN NAHAI: We'll go now to posing questions by board members to any of the speakers that just spoke. There are actually nine of them. But Ms. Cloke.

MS. CLOKE: How's that? I'd like -- I'm going to let you decide who answers, but among the three of you. But I'm really interested in the question of what projects -- the supplies that I'm interested in the discretionary question which it doesn't make a lot of sense to me because the new -- the -- the impact of this, as Mr. Dickerson said, is going to take time.

It's going to be cumulative, and we're not going to really see it. So I don't understand what binds us in terms of what we can include and what we can't include. I know, for example, that government buildings often go by their own level of government as to what rule they have to follow.

But it seems to me that, if we're going to impose these rules on developers and cities, that we need to impose them on ourselves as well. So I'd like

somebody to speak to those questions of what are our powers in terms of what could we include? That's question No. 1.

MR. BECKMAN: David Beckman. Let me respond broadly. And if you have specific questions, Alex Helperin may be able to respond to them. But the simple answer to your question is your powers are as broad as any land use in the jurisdiction under which the board has power, which is L.A. county and Ventura county.

You can regulate everything. And one of our fundamental points, and it's amplified by your question, that, what is before you, is a very small segment to begin with.

That was before you in September. What's happened now is the executive officer has pulled more pieces out so that of the landscape that contributes to the problem, all the different types of development projects, including those that were on the slide that Alex showed that we and the county have agreed to work with you are already only using -- only focusing on a small percentage.

The issue about discretionary versus nondiscretionary, that's also a good question. That's one of the most -- that's a purely legal loophole because in CEQA law and in planning law, discretionary projects are usually very few.

They are the really big ones that go before the board. But most of the changes to the urban

landscape are made little bits at a time by projects which do not require the approval of officials like yourself.

And so by constricting this world that you're regulating to discretionary projects, you once again, you know, focus even more minutely on only part of the issue.

So you have all the power today, if you like, to remove the discretionary exemption, which we suggest you do, and to broaden the scope up to and including what the county agreed to or even beyond it.

But certainly if you went to what the county agreed to -- and we can put it up on the slide if you'd like to see specifically what it is -- then you would have within the region, a level playing field within the county, outside the county, unincorporated and incorporated areas.

MR. HELPERIN: I would like to clarify one thing. The limitation to discretionary projects is a misinterpretation of some language in the permit. The only limitation -- this isn't even a limitation. But the only possible limitation you have is the permit that you yourself imposed in 1996.

That permit has a discussion of discretionary projects. But it's a minimum. It's not a limitation. So there's absolutely no reason why you couldn't go beyond discretionary projects and impose a requirement to have certain minimum standard just like

R0072005

any other building code that applies to all projects. That's the appropriate way to a consistent code system.

MS. CLOKE: My next question has to do with these thresholds which are being suggested, the 50 percent thresholds and the 5,000 square foot threshold.

And I'm not sure that -- I'm not sure what the appropriate threshold is. So I would like to ask you for your thoughts on the question of what constitutes, not just the number or the size for the appropriate threshold, but the reason why that's the appropriate threshold.

MR. HELPERIN: Alex Helperin again. When you say the 50 percent threshold, I assume you're referring to the gas -- retail gasoline outlets which --

MS. CLOKE: Remodeling. And I mean --

MR. HELPERIN: And redevelopment. Right. Well, first, let me just address the gas stations. If you have a pumping station and you're pumping gas, you should have these requirements applied.

There's no reason that, if you haven't attached a mini-market that happens to do a little less business, then the requirements apply. And if they do a little more, the requirements don't. Where is the logic in that?

R0072006

If you have a facility like a pumping station which keeps creating these problems, then the requirements should apply. And it shouldn't matter how much income you're getting from some alternative adjunct

facility.

With respect to redevelopment, there is a standard that we applied in the county that the county has applied which is, I believe, 50 percent of the cost -- 50 percent of the price of the total improvements on the land would require if -- let me start again.

Any redevelopment must incorporate the SUSMP requirements with respect to the area of redevelopment.

However, the redevelopment require -- the SUSMP requirements only apply to the entire facility if the improvements constitute -- if the costs of the improvements constitutes 50 percent of the cost of the existing improvements on the site. That was the standard county adopted, and I think it's an appropriate standard here as well.

MR. GOLD: Again, with the 5,000 square feet on the parking lots, on the same example -- I'm sorry. I'm Mark Gold of Heal the Bay.

In the same example that was given before in regards to the restaurants and the gas stations is that, you know, it shouldn't really matter whether it's a standalone parking lot or not on whether or not it's contributing to pollution.

R0072007

It's known that parking lots contribute to pollution. So that's the same sort of thing. As for restaurant sizes, I think we stated quite clearly that was arbitrary as well, and the irony is that basically

the size constraint that might be offered might have the exact opposite effect because it allows probably some of the smaller fast-food restaurants with drive-throughs, et cetera, might be able to squeeze through.

So I mean it's hard to say because the 5,000 is totally arbitrary. Thanks.

MS. CLOKE: I have two more, if I may. On the question of the waivers. If I said to you that I am -- that I think that you have to have some flexibility, I mean I don't think there's any board that can anticipate all circumstance, and people have to be able to make arguments.

But there's always a place where you draw that line. And so -- so if I say to you I think that we have to have some flexibility, but again, I don't know where you would recommend that line to be drawn.

I'm not -- I'm not sure even where -- where -- and I'm not sure what the effect of staff drawing the line, where there would be a line drawn, it has been.

R0072008

I want to be in the place of being as sympathetic to people's projects as I can possibly be and yet at the same time still protecting the water quality.

MR. BECKMAN: Well -- David Beckman, NRDC. Let me begin to answer this, and Alex or Mark may add to it. I think one critical component -- and we understand with the new program and really don't oppose an appropriate mechanism to bring to your attention as board

issues that come up that may not be anticipated today.

And for that reason, we think that one fundamental change that you should make is to have waiver requests come before the board.

Now, if that proves to be an unworkable situation because you have too many or they're too difficult, then you can at your -- whenever you want, you can change that mechanism.

But at least to begin with we think that it's critical that the board maintain control of the program, make sure the policy is being set in the way you want it to be set and work through these issues.

So that's one critical thing. It's not to have it at a staff level and have the executive officer be burdened with having to make the decisions. That's one issue, and I think Alex might have a couple other things to add to that.

MS. CLOKE: You might speak to permittees also being allowed two waivers.

MR. GOLD: Well, I was just going to say, if you recall the August draft, one of the things was it was strictly an 85th percentile capture standard. And one of the things the environmental community even said back there was it should be a capture infiltrator treat standard.

R0072009

And I bring that up because that really provides as much flexibility as is needed in the program because I don't know who's going to state that you can't

put a catch basin filter. And there are some BMPs that are pretty easy to do, redirecting rain gutters, those sorts of things that really doesn't really make much sense.

And where it is right now obviously is completely broad in the way it's laid out.

UNIDENTIFIED: I just wanted to say one quick thing about permittees. We are strongly against permittees granting exemptions, strongly against it. And to be blunt, it's because we don't have faith in a majority of the permittees having any interest in this program working and believe they would be overly liberal in granting exemptions.

And as Mr. Tamminen indicated that that would lead actually to more conflict. I think initially at least the board should control the program. And as it becomes clear when exemptions are appropriate or waivers, I should say, you might be able in the next permit to delegate some of that responsibility but not initially.

UNIDENTIFIED: I'll just add a comment with respect to the current standard that it has been proposed, has substantial problems. Right now it has three articulated situations in which a waiver would be appropriate plus any impracticability.

R0072010

So there's really no limits on the discretion of the executive officer at all to determine what would constitute a situation of impracticability.

Furthermore, two of the three articulated

situations of impracticability have to do with the permeability of the soil which, as you heard before, makes no sense because there are many other options, many other sources of BMPs that can be implemented.

So unless it's a substantial reworking of that language to explain that impermeability is only relevant to a waiver if every other sort of BMP has been ruled out and, as Mark said, that's very unlikely. Two of the three articulated standards that would substantiate a waiver make no sense whatsoever.

MS. CLOKE: Thank you.

CHAIRMAN NAHAI: Any other questions?

MS. DIAMOND: I have two questions. I just want to follow up on the last answer. Are you saying that, if waivers are granted, that it's probably not the case if someone applies to develop something that there are no BMPs that would work, that they may be able to say the soil is impermeable or for whatever reason something is unpracticable? But some of the BMPs should be applicable and practicable for almost any development?

MR. BECKMAN: Yes. Absolutely right. The board have already dealt with this issue last summer. You have selected cafeteria, like, a slate of things you can choose from for different situations.

R0072011

One of the flexible aspects of this proposal, it does not mandate "Thou shalt use a detention basin if" -- you know, instead of conditions. And so we have situations where infiltration may not be

appropriate. Everybody recognizes that. Don't use infiltration. We think you can cover everything.

MS. DIAMOND: One last question on the issue of conflicts with local practices. Do you think there are some situations where using the local practice might work or in all situations they should just use the BMPs that we have in the permit?

UNIDENTIFIED: We think the analog here is the one that applies in the Clean Water Act generally which is more stringent local standards can remain in place of course. But the point of what you're doing today is to set minimum standards that apply everywhere so it's a level playing field and to get away from the situation of judgment calls.

Frankly, you're also trying to change local standards. Local standards haven't worked. And so I think to open up and let anybody come in here and argue that their approach is more or less the same is going to swamp this program immediately with those kinds of comments.

And you know, the Regional Water Board is regional. And so your program should apply regionally.

CHAIRMAN NAHAI: Any other questions? I had a couple of things. I think on two of the things that you've said it's just the matter of clarifying language.

R0072012

For instance, with respect to the local practice issue, we have the language that talks about

defeat or circumvent, and I guess what you're really arguing is saying that the local practice can continue so long as it doesn't incorporate standards that are less stringent than those set forth in this document.

MR. BECKMAN: That's right.

CHAIRMAN NAHAI: The wording defeating or circumvent was supposed to get there, and it may require some clarification. And then on the other issue of the infiltration BMP as opposed to others in the waiver language, that again, is just -- I think the intent of board staff isn't as -- as Xavier testified earlier to say that just because infiltration is inappropriate or impractical, that that will -- therefore, that means that there would be a waiver of all the standards.

MR. BECKMAN: That's right. It needs clarifying. I agree with you that it wasn't the intent, but I think it's the way it reads.

CHAIRMAN NAHAI: Two other issues. First, I would like to see the L.A. county list up again. It went up and down so quickly that -- and you'll say --

MR. BECKMAN: You're telling us to speak quickly, and the court reporter is telling us to speak slow.

COURT REPORTER: Yeah. I do have to get this.

R0072013

CHAIRMAN NAHAI: I knew someone would hear that. That would have to be you, Mr. Beckman.

MS. CLOKE: I think we have to -- did we

also -- didn't I see a copy of that in what you submitted?

MR. BECKMAN: Yes. There is a copy. We made copies of our submittal for each of you but --

MS. CLOKE: I just don't want to look at it in the book. Tell me where it is. Oh, I have it. Nevermind. I found it.

UNIDENTIFIED: It's an exhibit to our letter. So you can see here that the county list begins with the seven types of projects with which you began. But recognizing that that was not a limitation, we and our experts and the county and their experts try to figure out, since we weren't doing this on a strict size basis, but rather we're doing it by project types what other sorts of project types would be problematic?

And you can see that we came up with a substantial list that we thought, if you cover all these, you're probably okay. Many of these the current proposal completely ignores. You mentioned hospitals, car washes.

There are several different -- dry cleaning -- several different categories in here. Nurseries that are simply not addressed.

R0072014

CHAIRMAN NAHAI: But now the part B categories were never included in the SUSMPs proposed by the staff; is that correct?

UNIDENTIFIED: I believe that's correct. I believe that's correct.

MR. GOLD: Except for the parking lots and

what you said.

CHAIRMAN NAHAI: One other question I had was with respect to rooftops. You know, we're getting arguments for both sides that there is not enough data to support, you know, having the rooftop exemption.

And their executive officer says there's no evidence to support, you know, not having a rooftop exemption. Could this be something that could be made subject to a reopener so that once further studies as to the impact of runoff from rooftops are available that one could visit this issue?

MR. GOLD: Well, I think you're saying -- me here answering this question because this is really an area that I've worked on for my entire career, and it's not just myself as a scientist specializing in storm water.

It's basically the top academic scientists throughout the country. It's the EPA. Everything is basically pointing to the fact that all of the problems -- a lot of the problems that we're having is that, when you increase impermeability, which of course rooftop is impermeability, it leads to all these detrimental impacts.

R0072015

I don't think there needs to be any additional studies in regards to this. I mean if we're going to sit down and wait for the aerial deposition study and then fold in the A.Q.M.D., I mean we're never going to get done.

The reality is that we need to face this right now because you're never going to -- I mean literally the body of evidence in this regard is feet tall, and it's clearly what we've seen is over time as impermeability has increased in one monitoring station or another throughout this region you've had increased pollutant loads. You've had increased flows literally by 10 or 20 fold.

Remember the Malibu Creek situation where they throw up flows from the 50's versus the 90's. And so this is basically the issue that we're trying to address, and flows are, of course, going to pick up pollutants and transport them to receiving waters, and we already know about the impaired receiving water problems.

CHAIRMAN NAHAI: So your point there is that, even if it can be established that rooftop runoff doesn't contribute a great deal to pollutant loading, that, nevertheless, in a situation where we have 50 percent of our rainfall get, you know, wasted basically, even if it was absolutely clean, the impermeability it just takes to the ocean, that having the rooftop exemption negatively impacts the ability to capture the rainfall.

R0072016

MR. GOLD: Absolutely. And that's basically it in a crux. And all the things that are associated with it, with all the various different contaminants, erosions, scour, and those sorts of things are going to occur when you fold that out and basically

you're going to have BMPs that don't work and aren't adequately maintained in that situation.

MS. DIAMOND: Can I -- just a question just to clarify. With some of the water from the rooftop in some storms, even if it's clean and pure as can be, eventually get onto the pavement and pick up the other oil and debris that's already there and then continue on its way.

MR. GOLD: Well, absolutely that's the case. And I know there's a small clause within there trying to avoid that, and I'm not going to pretend there isn't. But let's not pretend that once it gets into the M.S. 4 that everything is like all pristine and clean.

I mean this is obviously going to scour out all the pollutants that have accumulated within the catch basins, within the storm drain system and the like that are causing the problems.

I mean there's a reason why in the Caltrans case with the NRDC when they did their catch basin study and found out what was in the catch basin. Low and behold what a shock. You know, you end up finding a lot of contaminants.

That's what's in the storm drain system, and basically increased flow is going to cause that to go into their city waters.

MR. FLEISCHLI: Can I just add something real quickly to that --

COURT REPORTER: What's your name?

MR. FLEISCHLI: Steven Fleishli with BayKeeper. With regard to the proposal that the executive officer has put forth, he's tried to make a distinction to say that "Okay. If you're, like, on a Malibu Creek, then we're not going to allow this exemption to occur."

But if you look at -- and we had a meeting with environmental community with the Army Corps of Engineers very recently with regard to the Los Angeles River, and one of the biggest struggles there is all right.

There are a lot of great projects, Taylor Yard, all these other sorts of things on how we can move forward and try to restore some of the beneficial uses on these rivers. The number 1 problem that every single person there is having is the flow levels and the flooding capacity and capabilities.

How do we deal with that? And if you allow this volume to increase, essentially you're precluding us from restoring that river, the Los Angeles River, Ballona Creek, San Gabriel, and your authority clearly allows you to restore those.

In the Supreme Court, again, you don't need to base this on quality for the rooftop. You can base it solely on quantity and the impacts that quantity has had on places like the Los Angeles River that are already channelized and we would like to see restored.

CHAIRMAN NAHAI: Thank you very much.

R0072018

We need to -- it's now -- what is it? About five past 12:00. And we must break at 12:30, or we don't necessarily have to?

UNIDENTIFIED: We may not. I can check.

CHAIRMAN NAHAI: Well, in that case, I'm going to go ahead and hear from the other --

COURT REPORTER: If we can get a break soon. If you're going to go right through the lunch, then I need my break.

CHAIRMAN NAHAI: Ladies and gentlemen, we'll take a ten-minute break to allow our court reporter to get her fingers back together. And we'll see you in ten minutes.

COURT REPORTER: Thank you.

(A break was taken.)

CHAIRMAN NAHAI: We're going to go now to the second half-hour segment, and the first three speakers are Ms. Margaret Clank.

MS. CLARK: Clark.

CHAIRMAN NAHAI: Clark. I'm sorry. Mr. Bart Doyle and Mr. Desi Alvarez. Three minutes each, please.

MS. CLARK: Mr. Chairman and Regional Board members, my name is Margaret Clark. I'm the mayor protem in the city of Rosemead. I'm also a member of the San Gabriel Basin Water Quality Authority, which is charged with cleaning up the groundwater contamination in the San Gabriel basin. And I'm also on the board of the L.A.

and San Gabriel River Watershed Council.

And many of my friends here in the environmental community know that I've spent countless hours voluntarily on issues dealing with the environment, and I want you to know that that is where I'm coming from. But we do -- from a city standpoint, we do have some concerns, and I'm going to lead into those.

The executive advisory committee or EAC is the steering committee of the countywide storm water management plan. The EAC includes a mix of municipal representatives, two from the county of L.A., two from each of the six watersheds.

During our presentation, we will refer to specific provisions of the permit. We have provided each member of the board with a copy of the permit that highlights these provisions.

The permittees request the materials and evidence provided to the board be included as part of the record of this hearing. The permittees are the cities and counties of L.A. We represent municipal governments and their local elected officials which in turn represents the tax paying citizens in this region.

With respect to water quality, our objectives and those of our governing bodies are to prosecute water quality, comply with the permit and assure the compliance plans are effective in protecting water quality and ensure that compliance costs are commensurate with environmental benefits.

It is incumbent on public officials to ensure that public resources are achieving real water quality benefits and not just buying window dressing. Although the topic of record for this hearing is the SUSMPs, the EAC believes that this hearing is really about the appropriate process for developing and implementation of storm water treatment design standards for new development.

The permittees do not oppose storm water treatment design standards for new development. As a matter of the public policies, the permittees expect a thorough and fair process that provide for a stakeholder participation in the development of such technical requirements. It also expects a process that will be honored by the Regional Board and its staff.

There needs to be a clear understanding of what is required and what will be accomplished in terms of improving receiving water quality. Further, there must be a clear understanding of the public and private costs associated with implementing such a program.

The desire and need for such an orderly process for sending storm water treatment design standards is shared by the California Storm Water Quality task force which includes representatives from every major municipal storm water program in California.

Each member of your board has received a copy of this position statement. The L.A. Municipal Storm Water Permit provides a clear process for the

orderly establishment of meaningful and effective storm water treatment design standards where needed.

Therefore, the permittees oppose the staff proposal that attempts to unilaterally impose a one-size-fits-all storm water treatment design standard for new development. The permittees also oppose mandatory retention treatment controls for the subject new developments.

In considering this issue, it is important to recognize that there was wide stakeholder involvement in the development and the adoption in the L.A. permit. This is documented in finding 44 located on page 10 of the findings section of the permit where all of the groups got together.

Although the permittees had significant reservations regarding the permit, we have complied with the specified requirements. All required reports and programs have been made on schedule or in the case of the SUSMP five months before they were required.

Although the Regional Board staff proposal is presumably well-intended, it overlooks the fact that the permittees are now implementing a process leading to the development of design standards.

We believe that the proposed staff action and report need to be revised to reflect objective judgment and good faith in its interpretation of the L.A. County Municipal Storm Water Permit. Do I have one second left?

CHAIRMAN NAHAI: Well, beyond three minutes. If you do that, everybody else will want to.

MS. CLARK: I hear you.

CHAIRMAN NAHAI: I apologize.

MS. CLARK: Thank you very much.

CHAIRMAN NAHAI: Thank you.

MR. DOYLE: I will try to be brief. I am Bart Doyle, mayor of the city of Sierra Madre, and I'm also a member of the governing board of the San Gabriel Valley Council of Governments and treasurer. And I'm speaking on behalf of both organizations today.

Very briefly, I believe you have contained in your packet a resolution which was adopted by the San Gabriel Valley Council and governments of December 16 opposing the adoption and the numeric guidelines at this point in time.

And that was adopted by a vote of 27 to 0, 27 of our 30 cities were at, at that meeting, and participated. So it was a unanimous decision.

I would like to point out the details of our resolution that we are opposing the adoption of the numeric standards at this time until there can be an identification of the type of and quantity of pollutants generated by each of the types of developments that are called for in the scope of the regulation.

That the type and quantity of pollutants identified must pose a threat to and identify beneficial use consistent with the quirk, our water planning

requirements and that an evaluation of those structural controls required to meet numeric standards demonstrate the appropriateness of controlling each one of the target pollutants.

And finally, we'd like to see an out clause where there's an event that there's no feasible mitigation available that there would be available to basically do partial mitigation and otherwise opt out of any permanent requirements.

The council and governments was far more supportive of the original August 11 staff proposal for this permit, and we would suggest that you return back to that as probably the best balanced approach.

Finally, our board was sufficiently concerned that they feel that, unless there is a removal within numeric standards, that the council and governments intends to appeals the decision to the State Water Resources Board at the Water Control Board at the appropriate time.

Time is brief. I would like to go on record as saying that, as an elected official who's doing a very -- working very hard with his council and staff, I was very insulted with some of the remarks that were made earlier about the cities not taking the responsibility seriously.

We have evolved a system over a number of years. Based upon the fact that we are in the foothill area with very steep slopers that we look at hydrology.

We look at soil conditions. We do geotechnical reviews. We're in a seismically active area. We go all the way down to parcel maps and lot splits.

We conditioned a lot split on Monday night on the hydrology report. I think there are a number of cities in Los Angeles county, particularly those who are foothill communities, who are doing a very good job with this and have been doing a very good job with this.

And I think the assertion that we need to ratchet down with numeric standards is not well-founded. One other point. Because we are a foothill community, we have had catch basins and debris basins in our community since the 1930's.

I do not believe the low cost figures that were asserted by the advocates of this regulation. It is a major ongoing cost to clean these things out. Every time we have a fire or a major -- a major fire event or a major rain event, the basins have to be cleaned.

Los Angeles county maintains some of ours. We also maintain a couple of them as municipal catch basins. Our situation is that almost all of this water percolates into the east San Gabriel groundwater basin so we don't have a runoff problem. But it is an enormous ongoing expense.

It has reached the point where several years ago the county of Los Angeles has refused to accept operation and maintenance responsibilities for any more of these basins.

The other issue I would suggest you take a look at, which was not addressed previously, is the application of proposition 218 requiring a vote of the property owners under the assessments.

It's great to say, "Okay. The county won't be responsible. The city won't be responsible. We'll set up this other kind of assessment district." But what happens if the property owners don't agree to future assessments down the road for maintenance and repair? Thank you.

CHAIRMAN NAHAI: Okay. The three speakers after Mr. Alvarez will be Mr. Kennedy, Mr. Montevideo and Mr. Collacott.

MR. ALVAREZ: Good afternoon, Mr. Chairman, members of the board, my name is Desi Alvarez. And I chair the Los Angeles County Municipal Storm Water and Urban Runoff MPDES, executive advisory -- department of executive advisory committee.

And on behalf of the L.A. county permittees, I would like to point out the permittees did submit a SUSMP in accordance with the requirements of the permits to the executive officer for approval last year.

And we believe that the Regional Board needs to work with the permittees in developing an ultimate SUSMP. Since there are appreciable differences between the SUSMP model that was submitted by the permittees and the Regional Board, we have undertaken considerable discussions with Regional Board staff over

the last several months and the last few weeks almost speaking daily.

And we believe that a lot of the recommendations that were made today by your executive officer are very much in concert with some of the issues that we have raised regarding the December 8 version of the permit. However, we still believe that there are some other issues that we do have some differences.

I'd like to point out a couple of those. One of those is in the definition of environmentally sensitive areas. We believe, as the definition stands today, it is overly broad and that the definition needs to be consistent with the intent of the permit to provide special protection for areas of special biological significance.

And to meet this, we would suggest that you adopt language that basically states that the environmentally sensitive areas be defined as those that are joined, bisect or directly discharged to the significant ecological areas that's identified by Los Angeles county and any other areas of environmental significance as determined by municipalities.

The other portion of the permit where we have some significant difference is in the recommendation to implement design standards for treatment control BMPs.

And this specifically addresses itself to the requirement for a three quarter inch standard. We believe that this standard, as currently proposed, is

premature.

That there is a lot of issues that need to be worked out specifically when we talk about design of treatment facilities or flow-based, nonvolume-based. And the hydrology today is not there for the small scale events that represent the 85 percentile that we're trying to capture.

I do believe that we would be prepared to accept a alternative proposal. If you wish to consider this, that you implement a three-quarter inch volume standard for commercial development of 100,000 square feet and commercial development of 100,000 square feet only excluding all residential development in order to provide us for an opportunity to see how this works over the next 18 to 24 months.

If that is done, it should also be done in conjunction with a proposal that you will be hearing from SCAG later on. Thank you very much.

MR. KENNEDY: My name is Tom Kennedy. For a period of about six years between 1993 and 1999, a representative of the city of Vernon currently an operation's manager with the Olevenheim (phonetic) Municipal Water District of San Diego.

COURT REPORTER: Excuse me?

MR. KENNEDY: Olevenheim Municipal Water District. I was asked by the EAC to come here to speak about the chronology and the development of the SUSMPs. I was involved in that subcommittee and pretty much all

the other ones during the period of time.

However, before I proceed with that, I wanted to clarify there's been a number of references to the L.A. county program as being an example of a program that we should be following, and I just want to remind the board, as Dennis did, that a lot of the provisions in that were a result of the settlement agreement with the NRDC and not the result of a collaborative process or any sorts of scientific investigation.

Proceeding here, the staff reports suggests that the process outlined the permit be abandoned because of the implementation date of July 13, 1999 has passed. However, the lack of responsiveness by the Regional Board staff, because they're primarily understaffed, is the primary factor and delays that have gotten to this hearing at this late date.

The permittees have submitted every report and plan required by the permit on schedule. Specifically the model development planning program was submitted as required on January 29, 1998 in developing this model program. The permittees implemented a deliberate and open process to promote wide state over involvement.

R0072029

Multiple drafts were developed and circulated for comment --

COURT REPORTER: You have to slow down.

MR. KENNEDY: I'm sorry. I only have three

minutes. I'll slow down. Multiple drafts were developed and circulated --

COURT REPORTER: Sorry about that.

MR. KENNEDY: -- were developed and circulated for comment from permittees and interested parties. The permittees considered these comments in developing a program that they believe applies with all applicable state and federal regulations, the permit and which will be effective and implementable.

As has been the history of this program, Regional Board staff was sometimes less than timely in reviewing and commenting on and finally acting on the documents.

The permittees submitted a model development planning program to the Regional Board on January 29, 1998 by a letter dated April 10, 1998. The executive officer advised the permittees the program was deemed deficient.

The permittees submitted a revised program in August, 1998. Not until December 23, 1998, which is almost five months later, did the executive officer distribute the Regional Board's revision of the program to the permittees and other interested parties.

Finally, on February 11, 1999, the executive officer notified the permittees that the Regional Board staff's version of the model development planning program was approved.

And just in case I'm not able to finish, I

have a chronology (inaudible) that I can hand out for the record. While we're developing the SUSMPs, we were advised through comments received during the early planning that we should wait until after the BMP approval was done by the board.

And a comment received from -- I believe it was Heal the Bay, on April 15, 1999, it indicated that they were surprised to see the SUSMPs before the recommendation BMP list is approved by the board since the permit requires SUSMPs to incorporate the pertinent elements of BMP lists.

Heal the Bay recommends the county wait until the BMP list is approved by the board at the April meeting and then use finalized BMP lists to revise the SUSMPs accordingly, and that was one of the reasons we did wait.

And then as we finished the SUSMPs within a few week after that, I believe six weeks after that, even though we had six months to complete those. So the allegations of the staff report that we were not timely in submitting reports is unfounded. Thank you.

MR. MONTEVIDEO: Good afternoon, I guess it is now, ladies and gentlemen of the board. I appreciate your time today. My name is Richard Montevideo. I'm with the lawfirm of Rutan and Tucker.

R0072031

I'm here today on behalf of the executive advisory committee and the permittees under the permit. I want to start with a chant that I heard from the

videotape some three and a half years ago. The chant was "Pass the permit. Pass the permit. Pass the permit."

And in fact on July 15, 1996, this board passed the permit. It wasn't only a chant. It was the cause of that particular meeting. There's T-shirts that were passed out to this board, that were passed out to everyone, and they were passed out by the members of the environmental groups. You can see here pass the permit. Okay, what happened?

What happened was you passed the permit, and as you passed the permit, you imposed obligations on these permittees and more importantly, or just as importantly, you imposed obligations on yourself.

Those obligations do a number of things. But they -- with respect to the permittees, they require the permittees to submit certain programs, model program, the proposed plan right now, they have gone ahead and submitted that program that that particular plan is before you now.

Unfortunately, your focus today is not on the program that was submitted by the permittees as it is required to be by law. There is a specific administrative review process that is set forth in the permit that you passed.

Second slide, please. R0072032

This process requires that you focus on the program that was submitted by the permittees. This process is an administrative review process in effect due

process both to yourself and to members -- the permittees under this permit.

If you review the purpose, I took this directly out of the permit itself, and I've passed out copies to you. The administrative review process formalizes the procedure for review and acceptance of reports and documents submitted to the Regional Board under this order.

In addition, it provides a method to resolve any difference in compliance expectations between the Regional Board and permittees prior to initiating enforcement action. It provides a method to resolve and difference in compliance expectations.

These permittees have proceeded to propose a SUSMP program of their own. You have adopted a permit that gives them the mechanism to do that. You have adopted a permit that provides a process. What we're asking is that you follow the process.

R0072033

Next slide, please.

Very succinctly, the process is detailed in the permit, and you have the pages of the program that -- of the permit itself that lay out this program.

The executive officer has 120 days. If he doesn't like what he sees, he sends out a notice of intent to meet and confer. There are other portions of this process that is supposed to be followed.

We ask that you follow this process in your own permit. That's the whole purpose of setting forth

the process. If you do not -- next slide, please.

According to your own permit, again, this is on the second page of what I passed out. "The executive officer shall not take enforcement action against a permittee until the executive officer has notified the permittee in writing that the administrative review process has been exhausted, is that the executive officer has determined that a violation exists warranting enforcement."

We have not seen anything in terms of following this process. There has been no notice intent to meet and confer. There's been no determination within the first 120 days. All we ask is that you follow the process. All we ask is that you follow the permit that you passed.

CHAIRMAN NAHAI: Thank you very much. Following Mr. Collacott, we have Mr. Neil Miller and Mr. Tony Nisitch, I believe.

MR. COLLACOTT: Good afternoon. My name is Bob Collacott. I'm with the consulting firm of URSC Woodward-Clyde. I'm speaking here today on behalf of EAC. I'm speaking regarding the issue of the numerical design standards or numerical litigation standards.

The permittees, as was noted in the opening remarks, do not oppose the development of storm water treatment design standards for new development. In fact your permit number 96-054 prescribes a deliberate process for development of the storm water design standards.

So let's review what that process is. The first step is the development of a model program for storm water management development and planning, and that's noted on the provisions in the first part of your handout.

The SUSMP, which is intended to provide guidance in the implementation of the model program was submitted to your board in July of 1999 and amended later to address the Regional Board comments in August of 1999.

The second step in the process is the development of the integrated receiving water impacts report. And again, on -- if you look back to what is page -- a copy of page 65 of the permit, it states that the principal permittee shall, not later than July 21 of 2000, prepare and submit an integrated receiving waters impacts report.

The report shall include but not be limited to a comprehensive analysis of the results of the different monitoring data and feasible environmental indicators. It should also include recommendations on future monitoring requirements such as integration and storm water receiving water monitoring and regional receiving water monitoring if applicable. The report will be an integral part of the report waste discharge.

In other words, this report will identify in terms to receiving waters and pollutants of concern.

The staff report is premature in attempting to preempt this report which will be submitted to the

Regional Board by the permittees on July 31. The third step in this process is a component of the program evaluation report. And again, that's on page 65 of the permit. And it's highlighted on your handout.

And it states that the principal permittee shall not later than February 1st of 2001 submit a report on the identification of SUSMP components for which the performance standards will be developed and implemented during the next term of the permit.

The report shall include a schedule of development of performance standards. The performance standards will indicate the level of implementation necessary to demonstrate that efforts are being made to reduce the discharge of pollutants in storm water to the maximum extent practicable. This report will be an amicable part of the report of waste discharge."

The identification of needed performance standards will be based in part on the integrated receiving waters impacts report. Hereto, the staff report attempts to preempt the permit and report waste discharges.

The fourth step in the process is the development and implementation of the design standards criteria that will be necessary to achieve performance standards.

R0072036

It is expected that the Municipal Storm Water Permit to be issued in 2001 will describe more thoroughly the process by which the identified

performance standards and the supporting design standards or criteria will be developed.

It is clear that the permit provided a process for the development of performance standards and design criteria. It is also very clear that the permit contemplated that effort would occur "during the next permit period."

The staff recommendation attempts to circumvent the process provided by the permit and denies the opportunity for stakeholder involvement, the staff report any environmental community cites several areas nationwide that have developed storm water design standards for new development.

Where design standards have been implemented, public agencies have implemented a careful process similar to that described in the permit. In addition, they have facilitated wide stakeholder involvement in developing those standards.

On the last page of your handout, I've put a summary of my survey, and in every instance you will find that there has been wide stakeholder involvement, and it's taken some time. But anyway, in no case and each case the development of design standards --

CHAIRMAN NAHAI: Can you wrap up?

MR. COLLACOTT: Pardon?

CHAIRMAN NAHAI: Can you wrap up?

MR. COLLACOTT: In conclusion, I'd like to present another option to the board in terms of handling

R0072037

this option and that is basically to follow the process that's identified in the permit for the development and design standards. Thank you.

CHAIRMAN NAHAI: Thank you very much.

MR. MILLER: Mr. Chairman, members of the board, my name is Neil Miller. I'm the Public Works director with the city of Manhattan Beach, also a member of the EAC for the permittees here just to speak about a couple of other issues.

Those of us that are on the firing line of regulation at the local level do need very clear guidelines and information for the development community.

What seems to be missing to many of us is that clear relationship between the cost which is then -- have been examples of cost up on the board and the benefit.

In the past, the negotiations with the environmental community and with board staff, there's been a lot of discussion about the distinction of watersheds and how one's unique from another. And there are now lots of opportunities to test some of those presumptions.

R0072038

The county has their program, and Santa Monica and others have been stated as following up on what our chairman, Desi Alvarez said. We would propose to use those examples to get clear data that our building community will understand it that we can go in with a clear message and say, "Here's what these improvements

will do. This is how it will help the receiving waters." And we'll have clear examples.

There were no examples put up there. There was no examples in the permit of what the construction of these improvements will do in terms of benefit, in terms of the quality. We'd like to have that.

That will help us then go forward with the programs that we basically all want to do, but it's a matter of doing them at the right time or the program will fail.

Another issue is in maintenance, the cost of maintenance and inspections that will be required from the permit. It was mentioned earlier about proposition 218. Manhattan Beach is lucky enough to have a storm water utility.

We created it. It's a funding utility where there's an assessment on the parcels to pay for storm drain maintenance and storm drain programs. However, that was done before prop 218.

If there is a considerable amount of inspection, if this gets down to the single-family level, we will not have a methodology from that funding source to do the inspections necessary.

Of course you could say, "Well, you could look at other" -- you know, "reprioritizing your budget," and that will be a difficult thing for our council to struggle with.

R0072039

And I just want you to know that's a

constraint, and we would definitely support the high priority categories that have been presented with the exception of the numerical standards until we have the data from the programs that are in place now and following the process of the permit. Thank you very much.

CHAIRMAN NAHAI: Thank you, Mr. Neil.

MR. NISITCH: Good morning. I guess it's good afternoon. My name is Tony Nisitch. I'm the director of Transportation Engineering Services for the city of Santa Clarita, a town about 35 miles north of here. I say that because a lot of people don't know where it is. But we are a very rapidly growing area of the county.

I'd like to wrap up, I think, our part of the presentation as distinctly as I can. If you know me, that's very difficult for me to do. But what I've heard today and I've heard throughout this process is that these regulations are complex and difficult to understand.

I'll submit to you now that what I heard and what I think you heard is I don't believe that all of us in this room, number 1, understand what the proposal is that's on the table. We don't understand what it says. Further, we don't understand what it means because we don't understand the application, whether it's commercial. Is this water? Commercial? Is this water?

I think we also don't know, therefore, what

it does. In other words, will be effective in doing whatever we want to do. I think those things are before you. I don't think we have the answers to those questions. I don't think you've heard any testimony today that would counteract that.

I think there was so much confusion what we're saying, I think it's necessary to take time to develop those proposals, and I think there's time to do that. What we said is we think we need to follow the process spelled out in the permit all along.

We think, if you do that, you're more likely to hit the goal we're aiming at, and we believe that's to clean up the storm water. Something that we all share.

Another issue that I think that hasn't been talked about but I think needs to be talked about is storm water quality is but one component of the overall development process in the design, construction and maintenance of development projects that are literally millions of conditions that are considered, issued and things talked about.

I don't know of anybody -- I don't know of any reports done by anybody that would support the fact that the development process is already too simple and should in fact be lengthened and made more complex.

That goes to the point that I'm talking about whether or not we should impose these standards or we talk about waiver or we talk about flexibility,

administratively at the local level of the enforcement is taking place.

That's entirely -- it's very critical and so critical that I propose that the failure to adequately address that issue will be the downfall of these standards.

Finally, I'd just like to say we believe that there are alternative proposals that will be both more effective and more appropriate to meet the goals of the executive director on this board, and we believe you ought to take the time necessary to implement those. Thank you.

CHAIRMAN NAHAI: Thank you very much. That concludes that half-hour segment as far as speakers are concerned. We can go to board questions of the speakers that just made presentations.

MS. LYON: Yes. I think I'd like to have Mr. Desi Alvarez come back up. I believe you got cut off before you could entirely explain your alternate plan --

CHAIRMAN NAHAI: He wasn't cut off. His time was up.

MR. ALVAREZ: I was just being polite and respectful to the time limit.

MS. LYON: I was just a little bit curious if you could explain that a little bit more, please.

MR. ALVAREZ: At the last meeting of the EAC, we talked very much in depth, as we have, over and over every time we've met regarding the imposition of a

numerical design standard and the permit.

And one of the ideas that was kicked around was that there are agencies out there that are doing this already, and a lot of people are working their way through a lot of issues.

But if we had to look at a design standard now, could we live with any option. And one of the options that we did consider was that the design standard be applied to commercial development of 100,000 square feet or more and only commercial development of 100,000 square feet or more.

That would exclude all residential development whether it be subdivisions or condominium and apartment complexes and develops 100,000 square foot parcels or larger. The reason for that is because there's more control, we believe, in terms of maintenance of BMPs with commercial development.

The commercial developers tend to be a higher value type of development where the impact of the cost of implementing this requirement would be a smaller percentage of the overall costs and since we believe that a lot of this would be experimental in nature because there are a lot of issues to be worked out.

And it is not as easy as just say, "Just do it." Everytime somebody does it, they jump through all kinds of machinations to make something work short of retaining that three quarter inches on-site.

Because any treatment facilities require

many assumptions, and they're not going to be consistent and are not consistently being applied today, and that results with BMPs that may or may not work properly.

And I will give you one example. One of the issues -- or one of the treatment processes that was brought up earlier was the implementation of oil, water separators. I think somebody mentioned that.

Now, a water separator would be a very good type of treatment facility particularly targeting oil, grease and the type of stuff that's coming off of surface vehicular access type of areas.

Those are sized. As currently designed, you would end up jumping through several hoops to get from a three quarter inch to some kind of flow-base standard. If that's put in place and you get a large storm event and the flow is significantly larger, what will happen, it will just create a siphon condition in some of these oil, water separators and flush out all the sludge and everything else that the oil water separator is retaining.

And that's a very real issue. So there are a lot of design standards that do need to be developed. We would think that we just work with commercial developers in the next 18 to 24 months. It would afford an opportunity to flush out some of these issues.

We also put that in with the caveat that it go in conjunction with the proposal from SCAG. Basically there would be significant monitoring of how this is

working, and that monitoring goes to all of the design issues and implementation issues as well as cost issues that SCAG would also be available to make resources from the 208 program to provide for additional studies that would be required.

And that's a source of funding. Funding for a lot of this stuff has been very difficult to come by. We just haven't had the funds. A lot of people here will say, "We've been doing this for ten years." And it's true that ten years ago, actually probably 11 plus years ago now that we're in the year 2000, there was this regional discussion to talk about a storm water permit, and a lot of things that probably should have happened have not occurred because of lack of funding.

MS. LYON: I guess I should ask the chairman. When will we be hearing from SCAG?

CHAIRMAN NAHAI: Whenever they want to speak to us.

MS. LYON: So that would be during the general comments later?

MR. ALVAREZ: I'm not quite sure. We had submitted a list of names, and maybe our card didn't get in. But they could speak later. I believe they have a card in. Mr. Pisano is here from SCAG, and he was going to talk about their proposal.

CHAIRMAN NAHAI: I anticipate that that will take place when we come back from lunch?

MR. MONTEVIDEO: If there aren't any other

questions, I would like to follow up on what Mr. Alvarez had to say in response to this line of questioning --

COURT REPORTER: What is your name again?

MR. MONTEVIDEO: Richard Montevideo. I'm sorry. The importance of the permittees submitting a program under the existing permit is critical for this board because, if I submit you a program for purposes of the L.A. county, you can't approve that.

If the NRDC or Heal the Bay or somebody else submits a program for all of Los Angeles county, you can't approve that. Even if your own Regional Board submits a program for Los Angeles county, you can't approve that.

The permit identifies a very specific process. The process is that these permittees have to submit the program. The action that you're taking today is not on these permittees proposed program.

It's supposed to be on whether their program reduces pollutants to the maximum extent practicable. That's the charge of your executive officer.

If that charge is not followed, that means he hasn't complied with the review process. These permittees then just move forward under the program that they submitted, if there is no response that process.

I guess my point is that taking the actions being proposed, legally that you're proposing to take today or may take today, legally has absolutely no

effect. Because at the end of the day, the process that was outlined in the permit that you adopted in 1996 is a process that has to be followed.

It was proposed after much discussion, 18 months of negotiations, and it's very important that that process be followed. Otherwise whatever you do today is irrelevant. And at the end of the day, these permittees are still going to have to go through their program with Mr. Dickerson and staff and get that program resolved.

CHAIRMAN NAHAI: Thank you. We will seek our counsel's response to your contentions. Ms. Cloke?

MS. CLOKE: Mr. Doyle. Is Mr. Doyle still here? Do I have the right name? From Sierra Madre. Has he left?

MR. ALVAREZ: You have the right name. He may have had to leave.

MS. CLOKE: I see. Okay. Anybody representing a hillside community who's spoken to us in the last segment of the program.

MR. ALVAREZ: Mr. Nisitch from Santa Clarita, I think, would qualify as hillside community.

MS. CLOKE: I wanted to ask you if you would look at the definition of hillside that is in the proposed plan.

MR. NISITCH: The one -- December 7 proposal?

R0072047

MS. CLOKE: The one that has the --

CHAIRMAN NAHAI: You would have to look at

the December 7 together with the change sheet.

MR. NISITCH: It's --

MS. CLOKE: It's erosive soil conditions, grading of any natural slope that is 25 percent or greater, and there was also a condition in a previous iteration about cut and fill over 30 feet.

And I wanted to ask you is this -- does this capture -- if this were enacted, how much of your community would be involved in a standard like that?

MR. NISITCH: Let me first state that from a slope point of view quite a bit. We have -- our city is very hilly. And it's kind of a group of hills. And one of the things that the developers do is level those hills and -- to get away from that requirement. Large -- I would say perhaps maybe 50 percent of our community have looked at it in total because it would meet this definition.

R0072048

MS. CLOKE: And is that residential community or other kinds of construction?

MR. NISITCH: It's both residential and probably industrial. We have those kinds of facilities that want to locate in those areas.

MS. CLOKE: Okay. And my second question to you is when -- when these -- if this plan is approved and the commensurate city ordinances are enacted, then would it be reasonable to assume that your own building and safety department, when they go out anyway to a construction site to go through their checklist, would be

also going through this -- this would also be part of their checklist, or do you envision that this would be a separate implementation and permitting process?

MR. NISITCH: I think the answer to that question, we prefer that it be just that, another item on their existing checklist as opposed to a different item with a different person.

Those of us that looked at combination inspectors as opposed to one inspector or, you know, have a inspector as opposed to four or five that, you know, just on resource basis to go out and try to develop a standard that is so difficult you need a specialist to go do it.

Not only is it more expensive for us to administer if we find the simply -- if we need four or five people to explain it to a builder, the builder needs four or five hundred other people to figure out what it means too.

MS. CLOKE: I prefer for the building and safety implementation myself. I think that's the easiest for everybody. Thank you, sir.

CHAIRMAN NAHAI: Any other questions? I had a question for Mr. Miller, if he's still here and then -- Mr. Miller, this was my question to you. Since you represent Manhattan Beach, and in your presentation, you spoke about, you know, possible costs to builders within the city and so forth.

R0072049

And I wondered, though, in that equation,

have we stopped to think what the cost would be to the coastal economy which is so important to your city if we don't at some time, you know, move forward to deal with urban runoff pollutions --

MR. MILLER: Yes, I have --

CHAIRMAN NAHAI: -- or do you think that it doesn't affect your city at all?

MR. MILLER: No. That's not what I'm saying. It does affect our city obviously. We are a coastal community. And I think what we're saying is, though, at this point we don't have a clear picture to take to the developers, especially the smaller developers as to your $10,000 or $15,000 or $20,000 investment is going to help to what degree as far as the pollution of the ocean or the beaches right in front of you.

We haven't implemented many of the BMPs. We have gone farther than the permit requires in our local community in areas that we know where it's effective.

But just to have a broad numerical standard without that connection I think will be very difficult to implement and sell to that community -- to the development community.

R0072050

If I could just follow up, that is the reason we would like to see the results of that work that's in place now so that we'll have that.

CHAIRMAN NAHAI: Thank you. I appreciate it. Would you address Mr. Montevideo's concerns about

legal -- is this an administrative review process that we're undergoing at this time?

MR. LEON: I think it does qualify under the provisions of the permit that Mr. Montevideo has cited. And I had an opportunity to review the comments that Mr. Montevideo made, he has made previously along with some of the comments from the EAC.

And there is a response to the argument in the material that's designated the staff report reportive decision. In summary, Mr. Nahai, it's very important to recall that, despite the fact that the provisions as Mr. Montevideo has stated them to be, it's certainly -- it's an accurate portrayal of what's in the permit.

That those provisions are no longer meaningful given the fact that we've moved a long way from where we were in 1996 when the provisions were first promulgated. It's very important that the deadline for the implementation of the SUSMPs has expired. That was July 30 of 1999.

R0072051

The board can, in my view, view the provisions of the permit as now being expired and no longer meaningful in light of several practical consideration, and considerations that have to do with the impacts on the parties.

I think that the reason for the provisions having to do with the administrative review process was to protect the parties, the permittees, from having to be

unilaterally told to do at that stage of the process.

However, we've gotten to a point now where there has been lots of exchange of information between the staff. There's been lots of exchange of proposals. As I think even you, during the opening of the hearing, noted that the parties have had ample opportunity to review the previous proposals to comment on those proposals, and the staff has been responsive.

We're charged by the other side, not the EAC but the environmentalist with giving them too much because the changes to the drafts have been so extensive.

And so we're at a point where we have to decide is there any real prejudice to the parties? I think there isn't because of the fact that there's been so much exchange of information and opportunity to comment.

R0072052

Well, Mr. Montevideo said there wasn't any real meet and confer. Effectively there was. There has been, as you know, many meetings held between staff and EAC representatives and permittees.

In fact, I don't think that Mr. Montevideo or the EAC can actually cite -- certainly they haven't yet -- any real prejudice to the parties as a result of the process.

It's true, if I had my druthers, I'd rather stick to the process because it's so clean. It fits neatly into the permit requirements. But I think it's also within your discretion, given the actual facts, the

actual history, the actual process, the actual communications and the exchange of information that the board has some discretion here.

I don't think it needs to be blindly told we're going to ask you to delay for delay's sake. And that's what's happening.

CHAIRMAN NAHAI: If I understood you correctly, you're saying that to the extent the permit contemplated a process of communication back and forth of submittals of review of those submittals and comments on them, that that has taken place already over a long time with many, many communications.

MR. LEON: I think it has.

CHAIRMAN NAHAI: So that really the intent and perhaps the actual letter of that requirement has already been satisfied even though there may not be a document that says this is a meet and confer letter. But that that's not necessary because those discussions and exchanges have already taken place.

If I also hear you correctly, you're saying that in any event, now with the situation that the deadline for the finalization of the SUSMP has already passed and that that process was never intended to be one in which one side could interminably delay the process by saying or reaching the conclusion by saying here's one draft. Here's another draft and going on in that way. Is that --

MR. LEON: Absolutely.

UNIDENTIFIED: May I respond to that, Mr. Chair, just very briefly.

CHAIRMAN NAHAI: Do you absolutely have to?

UNIDENTIFIED: Well, one point because it is a very important point. What we're talking about here is a due process requirement that was specifically negotiated and included in this permit.

Now, it's one thing to say we can dispense with due process if it in effect has been complied with. But here it hasn't been complied with. There have been delays. Yes. There have been delays, but those delays, as you heard from this presentation today, were the delays primarily on the Regional Board staff, not on the part of the permittees.

So the delays you can't -- you rely upon a delay on your own part to say let's dispense with due process as provided in the permit itself. Secondly and more importantly, no prejudice, no prejudice. The permit is a specific process that has to be followed.

The process says look at what these folks have submitted to you. You have completely ignored that process. The slide that I had showed you that goes through 120 days, the meet and confer process, is a process that's designed to look at what the permittees had submitted to you and to resolve those problems beforehand, not to look at what the board is trying to mandate on these permittees. **R0072054**

Even now today we're still getting changes.

We don't even -- it's a moving target. It's your moving target. It's supposed to be -- if it's going to be a moving target, it's supposed to be our moving target.

The prejudice is that you've completely ignored the fact that it's our program that you're supposed to be focusing on, not the Regional Board's program, and you're supposed to be giving us time, not on the last day here, looking at changes. But give us time in advance to review the changes to work out the problems with our program.

CHAIRMAN NAHAI: Thank you. Any other questions?

MR. ALVAREZ: If there are no other questions, first I would like to thank the board for this opportunity. And secondly, I'd like to ask for the indulgence. There are two individuals who have been here all morning. They have to leave this afternoon. And one is Mr. Pisano, and the other one is Mr. Bruce Barrows, who's the vice chair of the Gateway Cities COG.

They would like to speak. If you could allow them to maybe come up and use their three minutes at this point, I think they would appreciate that.

UNIDENTIFIED: Mr. Chairman, there are others who have been sitting here all morning --

CHAIRMAN NAHAI: Well --

R0072055

COURT REPORTER: Wait --

UNIDENTIFIED: -- and I was told we would speak in the order in which we presented our cards. And

I think that's fair enough.

CHAIRMAN NAHAI: That's what we've arranged. Does it really matter if we allow a speaker to go beforehand?

MR. ALVAREZ: The last issue, if it makes a difference, we only had nine speakers --

CHAIRMAN NAHAI: I know. But I'm going to -- with due respect, I'm going to decline. We've decided to not grant any favorable treatment to anybody.

MR. ALVAREZ: Thank you, by the way, for your time.

CHAIRMAN NAHAI: Thank you so much. All right. Well, in that case then we will break for lunch, and we'll see you here -- what time will we see everyone?

We'll see everybody back here at 2:00.

(Lunch break.)

* * *

STATE OF CALIFORNIA)
) ss.
)

I, CAROLINE JETTER, CSR 11568, a Certified Shorthand Reporter in and for the state of California, do hereby certify:

That the foregoing proceeding was taken down by me in shorthand at the time and place named therein and was thereafter reduced to typewriting under my supervision; that this transcript is a record of the testimony given by the witnesses and contains a full record of the proceedings which took place at the time and place set forth in the caption thereto.

I further certify that I have no interest in the event of the action.

EXECUTED this 4th day of February, 2000.

Caroline Jetter, CSR

R0072057

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

PUBLIC MEETING/HEARING

TRANSCRIPT OF PROCEEDINGS

January 26, 2000

2:10 P.M.

Holiday Inn
303 East Cordova Street
Pasadena, California

REPORTED BY:
Jennifer S. Barron
CSR No. 10992
Our File No. 1-62540

APPEARANCES:

BOARD STAFF:

H. DAVID NAHAI, Chair

MARILYN LYON, Vice-Chair

FRANCINE DIAMOND

JACK J. COE

SUSAN CLOKE

ROBERT MILLER

TIM SHAHEEN

DENNIS DICKERSON, Executive Officer

XAVIER SWAMIKANNU

JORGE A. LEON, Staff Counsel

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CHAIRMAN NAHAI: Ladies and gentlemen, please, take your seats and we'll resume. I'd like to start again, please. Please sit down.

Okay. We're going to just go forward now and allocate three minutes to each speaker. You can see the number of cards I have here. So in order to get through this, it's just so important that you limit yourselves to three minutes, please.

To start off, I'd like to call on Miss Alexis Strauss, EPA, please.

MS. STRAUSS: Good afternoon, Chairman Nahai and board members. My name is Alexis Straus. I'm the director of EPA's Water Division. Thank you for your patience in working through this issue with so many comments.

I would like to urge, as we did in our correspondence, the board's adoption of this modest proposal. I think it's very timely that this action take place now, given the overall lack of progress, I'm afraid, in implementing the permit since its adoption. Perhaps it was unavoidable that a great deal of planning discussions needed to occur, but I am willfully concerned that we lack the necessary impetus in moving from the planning stage to the implementation stage.

As I look ahead -- instead of focusing on this dilemma before you today, as I look ahead over the next ten years, we will be going through both storm

water and discharge permits two more cycles of, let's say, five-year permit terms a piece, and in each of those two cycles ahead, we need to make substantial progress.

I feel that we have not made much progress in this permit term, and we were very intricately involved in how this permit came to be established and what its terms are. And I am very concerned that here we are more than halfway through this particular permit with very little in terms of water quality protection to show for it.

But I don't mean to indicate any disrespect for the cities involved because it is a very large task, but what is before you today I think is, in fact, a very modest proposal. I think it is critical to act now to enact this particular proposal.

Although, I would favor removing some of the exemptions, for two larger reasons I think the board needs to act. One, we significantly lack adequate staffing for the Storm Water Program throughout the State of California and, in particular, in this Regional Board. This board cannot afford to have its staff spending six-plus months on this particular topic and nothing happening on all of the other aspects of the Storm Water Program, let alone the backlog in NPDES permits and all of the other aspects of the water protection programs.

I am worried that we are going to get

bogged down procedurally in this permit and that everything is not happening. There is not a sufficient field presence. There are many other requirements in the Storm Water Program that are not being met.

I think the proposal needs to be simple, and it needs to be understandable. Any of us at any level of government, a public person should be able to pick this proposal up and be able to understand the obligations they're under. And for that reason, I favor removing some of the exemptions that have been proposed, such as the rooftop exemption.

My second concern, other than are we adequately carrying out the Storm Water Program together, is that over the next ten years the Regional Board, many different parties in this room and we at EPA, will be engaged in studying the polluted waterways in this basin, looking at their sources of pollution and trying to analyze where we should allocate that pollution load, and as you understand, I'm talking about TMDLs.

The requisite steps before us are to begin to address the problems that we're having in meeting the beneficial uses, and I see today's proposal as beginning to address storm water as critical in snatching the low hanging fruit, as it were, in doing the simpler, readily available design standards for new development as a start toward what will undoubtedly be far more painful at future board meetings five and ten

years down the line as we start talking about far more stringent limits in storm water permits and far more unpalatable than the kind of proposal that is before you today.

So I think it is vital that we begin now to take these very modest steps by adopting a design standard. We're not adopting effluent limits. Then I would expect the whole room would be up in arms, but we're just looking at a design standard and the associated BMPs.

We spent six months in this dialogue. There's very little else happening on the ground at this point. I'd like to seize this opportunity to meaningfully move forward. This is but a prelude to far more difficult measures that we will be considering later. We are needing to reverse the rapid deterioration that we've witnessed in the basin's waterways in our lifetime. Thank you.

CHAIRMAN NAHAI: Does anybody have any questions?

The next card I have -- let me call out -- I'm going to call out three people as we go. Next card will be for Mr. Craig Perkins, followed by Miss Sandy Brown and followed by Miss Eileen Ansari.

MR. PERKINS: Good afternoon, members of the board. And for you new members, I'm sure that this is a good time to be added to the board and make what are going to be challenging decisions for the future of

the basin.

The first thing I'd like to do is indicate that last night at their council meeting, our city council adopted a resolution in support of the strongest possible standard. And just to relay a couple of the findings from that resolution, our council believes that a numerical standard which includes all portion of new development, including roof areas and surface parking lots, is necessary in the plans to ensure their effectiveness.

Our council also believes that up-front amounts spent on BMPs is a small percentage of total construction cost with region-wide benefits. And, thirdly, each new development project must become a part of the urban runoff solution as opposed to continuing to be a part of a growing problem.

In simple terms, the city council opposes the proposed amendments which would weaken the original draft of the standards and supports numerical -- the numerical standard as presented in the August draft, the pre-December 7th draft.

Really what it comes down to is us choosing whether we are going to continue to stay behind the curve or pledge at this point to move forward and be ahead of the curve. The bottom line where the rubber meets the road, literally speaking, is reversing over a century of standard engineering practice, which is focused on moving storm water off a

parcel as quickly as possible, essentially out of sight, out of mind. That is the concept.

And instead adopting a standard which results in stewardship of the watershed at the individual parcel level and protection and restoration of that watershed for the future. It's the only approach which makes sense. We really do truly care about water quality within this basin for the receiving waters.

My city council and I urge you to be leaders and to be visionaries to resist the temptation and to drift towards the lowest common denominator and the path of least resistance. If you do the right thing, I believe truly that a marvelous thing will occur. And what that is, is that my colleagues and peers in the design development of public works communities will use their intelligence and imagination, which is immense, to turn the past on its head and create a watershed responsible model for new development that the region so desperately needs. You're the people who can blaze that trail, and I thank you for this opportunity to speak today.

CHAIRMAN NAHAI: Thank you. Any questions?

Mr. Perkins, I had a question to ask you before you go. Any questions? I wanted to ask you, the city of Santa Monica has had a numerical limit as part of its regime now for how long?

R0072066

MR. PERKINS: For about six years, five to six years it's been in place.

CHAIRMAN NAHAI: And what numeric limit is it?

MR. PERKINS: The requirement of our municipal ordinance is that the runoff for each parcel must be reduced by 20 percent over what the average runoff factor would be for that type and size of parcel. It also has a specific requirement for parking lots, which require the retention of 1 inch within a 24-hour period. Surface parking lots.

CHAIRMAN NAHAI: And how is -- over the last six years, how has this ordinance affected the rate of development within the city?

MR. PERKINS: It has not affected the rate of development at all. And, in fact, I think that all of us recognize that Santa Monica is one of the most intensely attractive communities in terms of new development that's been occurring in the region, particularly commercial development, and, in fact, over the last five or six years, that has exploded as opposed to being reduced in any fashion.

CHAIRMAN NAHAI: What has been the rate of development companies that have failed within the city financially as a result of the ordinance?

MR. PERKINS: That would be zero to none.

CHAIRMAN NAHAI: Miss Cloke.

MS. CLOKE: Mr. Perkins, one of the

issues before this board is the question of discretionary permits, you know, commercial developments, everything that is going to be included in the scope of this permit. Can you describe for us what's included in the scope of the Santa Monica ordinance, and, if I remember correctly, it starts with single-family homes and goes up, but I don't think there are any exclusions. So if you could speak to those issues and how in your six-year experience which makes you a leader in this, how that's worked?

MR. PERKINS: Okay. Our ordinance has no exclusions whatsoever. All new development must comply with the ordinance, whether it be single family or a large commercial office building and everything in between, including all public projects, including school district and federal and state projects.

However, the problem we have had with those categories is that since they come under the Office of the State Architect for their approvals, they don't technically come through our building permit process. And so since we don't have that permitting rule, what we've done with the school district is tried to form a collaborative, cooperative relationship to encourage them to abide by the ordinance even though, technically, they could probably use that loophole to not comply, and we've been effective in doing that in some of their new construction.

R0072068

It's interesting to hear some of the

previous speakers talk about single family as an area where perhaps there should be an exclusion. It shouldn't be covered. Well, in our experience, single family is the easiest in terms of the compliance with the runoff reduction requirements. There are more opportunities. By definition, there's more open space on that type of project, and that's the most cost effective place to start if you really need to start somewhere.

So our ordinance currently is all comprehensive. There are no exclusions. The main difficulty has been in those commercial areas of the city where the development is lot line to lot line with subterranean parking. We have in those cases attempted to creatively identify BMPs which can be implemented off-site but adjacent to those projects through things like catch basin inserts, diverting water to tree wells on city sidewalks.

We're currently looking at a project where we may open up a portion of the alley behind the project for the -- increase the permeability and direct some of their rain gutters to those portions of the public right of way. So there are situations where it's very difficult, and so there needs to be a creative and imaginative look of what opportunities there may be and how to implement them.

R0072069

MS. CLOKE: Do you have a waiver system?

MR. PERKINS: There is a waiver system as

a part of the ordinance. The way it's stated is if it could be shown to be technically or financially infeasible to do the -- to comply with the ordinance, then a waiver can be requested for a full or partial waiver.

In the five or six years since I have been there that whole time and have been personally responsible for any of those waiver requests, there have been less than ten which have been granted and probably one in the last two years because as we have moved forward and gained experience and as the design community has increased their awareness and the level of technology has become enhanced, there are more and more ways available to comply. And so we feel that the waiver process, if there's some flexibility, is not really something that we have to exercise at this point.

MS. CLOKE: One final question. This is all new construction. What do you do on your end with supplies to all new construction? What do you do with remodeling and, you know, small additions and so on?

MR. PERKINS: In Santa Monica, we define "new construction" as any project which involves a 50 percent or more change to the building structure, and so that would be -- a substantial remodel would be covered by this ordinance. Anything less than a 50 percent change would not be covered at this point in time.

MS. CLOKE: And an addition?

MR. PERKINS: Yes. Yes. On a single-family home, it would have to be an addition which increased the square footage by more than 50 percent of what had been there before.

MS. DIAMOND: And just to follow up on that, on any redevelopment that has 50 percent or more, they have to then go back and they have to basically put in BMPs that affect the entire project; is that correct?

MR. PERKINS: That's correct. The entire parcel that's being developed, yes.

MS. DIAMOND: Thanks.

MS. LYON: One quick question, and do you -- do you charge in-lieu fees for any of that?

MR. PERKINS: We do not currently have an in-lieu fee provision. As a matter of fact, in the fall of last year, we identified to our city council what we believed was a need to implement an in-lieu fee for some of the very difficult parcels. That has been on hold essentially waiting for this board to make its final decision because that will in essence tell us how we need to move forward in terms of the revisions to our municipal ordinance. **R0072071**

The in-lieu fee we would only collect as a last resort if our council does, in fact, adopt that. We believe that it would be a better approach to have the developers do off-site improvements with BMPs and

catch basins or other sorts of off-site locations where a specific structural improvement can be made as opposed to -- we wouldn't want to collect money which we then have to administer and track and cause a lot of administrative problems. But we would like to have the structural BMP implemented as adjacent to the new project as possible.

CHAIRMAN NAHAI: Thank you very much.

Sandy Brown.

MS. BROWN: Good afternoon, Chairman Nahai, board members, Mr. Dickerson. I am Sandy Brown, Deputy Chief of Staff for Senator Tom Hayden, and I have a letter to read from the senator.

"Dear members of the board, if not for my commitments in Sacramento, I would appear before the Regional Water Quality Control Board today to voice my strong support for a standard that ensures meaningful reduction of urban runoff. It is time for this board to commit to solving the No. 1 source of pollution to our coastal and inland waters.

"If left untreated, runoff will continue to adversely affect millions of people and aquatic life throughout the Los Angeles region. Any minimal effort which does not ensure 100 percent mitigation of the runoff generated by no greater than a three-quarter inch storm will be nothing more than a weak step in the right direction. It is not a solution. All specified new and redevelopments must ensure such mitigation

through treatment or infiltration with no exception.

"Unfortunately, the cementation of Los Angeles enjoys wide support among the downtown power brokers, so it should be no surprise that structures including new and redevelopment parking lots, industrial sites, automotive repair garages and gas stations have become L.A.'s collection pits for pollutants.

"The storms carrying contaminated sediments to the streams, rivers and coastal waters will continue. The resultant pollution must be reduced and eventually disappear.

"Your adoption of reasonable design standards and best management practices as specified new and redevelopment is cost effective and ensures mitigation. Developers will appreciate that there are no surprises, no hidden costs when it comes to pollution prevention.

"Research indicates that 85 percent of the storms that hit the Los Angeles region dump no more than three-quarter inches of rain in a 24-hour period. The L.A. Regional Water Quality Control Board has the ability to dramatically reduce untreated storm water runoff. I hope the board will act responsibly and support a strong plan without amendments.

"Sincerely, Senator Tom Hayden."

And he is Chairman of the Senate Natural Resources Committee. Thank you.

CHAIRMAN NAHAI: Thank you.

Eileen Ansari.

MS. ANSARI: Chairman Nahai, board members, Regional Director Dennis Dickerson and staff, my name is Eileen Ansari, Mayor Pro Tem of the City of Diamond Bar and Regional Council Member for SCAG.

I stand before you from a city of 58,350 people that's an inland city, a hillside city that started being developed in 1962 and became a city ten years ago. We have a staff of 32 people. We're a contract city. We're cost effective.

One of the issues that we have -- that we continue to have is the cost of permitting. We want clean water. But I have -- as an elected official, I have to be responsible for my city, and I have to talk about for other cities also.

I wear two hats. I come to you for Diamond Bar city as an "environmentalist," quote, that started a group called "Save Tonner Canyon," concerned about runoff into canyons, and we were able to work with the builders so that we would have -- we would have collecting basins, catch basins and tried to work with builders, and we have been able to have a working relationship with builders in our city. Not always happy about things but trying to reach a compromise.

I wish to speak to you about trust. I and other members of the city council and city staff feel that the Regional Board staff is not honoring its

own permit, and here's why: Staff had revised this SUSMP issued by this Regional Board staff on December 7th of 1999 to include two requirements that the principal permittee and other permittees did not propose in its initial SUSMP submittal on July 22, 1999.

The first requires permittees to impose on new developments mandatory retention treatment controls. Nothing in the municipal permit that you adopted in June of 1999 or in the Model Development Planning Program that you adopted last year even remotely suggests that cities are supposed to impose mandatory retention treatment controls on the seven categories of new development that are now specified in the permit.

The second would require to increase the number of developmental projects requiring SUSMPs from seven to nine types. This is totally unjustified. On page 34, the permit says that, "At the minimum, SUSMPs and guidelines shall be prepared for, one, a hundred-plus home subdivisions; two, ten-plus home subdivisions; three, 100,000 square feet developments; four, auto repair shops; five, retail gasoline outlets; six, restaurants; and, seven, hillside-family dwellings."

R0072075

The two unauthorized categories that staff has added are developments located in an environmentally sensitive area and any parking lot with

24 or more parking spaces. We believe that neither staff nor the board may add these requirements without reopening the permit.

This is not to say that we are not concerned about preventing pollutant runoff from entering environmentally sensitive areas or reducing chemicals and runoff from parking lots, but they're already covered. The environmentally sensitive areas are covered in the Model Development Planning Program, and parking lots are covered in the permit. They must be swept regularly to remove debris from industrial, commercial motor vehicle parking lots. And according to studies referenced in the municipal permit, sweeping is an effective, best management practice in removing pollutants from outdoor services.

We also note in the Regional Board's staff report that the city of Long Beach permit which was adopted in 1999 limits SUSMPs preparation for four types of new development projects. Five fewer than the staff is proposing now for cities under the L.A. permit. How can this be seen as fair?

R0072076

If Regional Board staff cannot be trusted to abide by the permit that you adopted, how can we believe it is right in other matters? How can we believe that the data staff is using from the L.A. County monitoring port to justify additional requirements as being interpreted objectively, and how could we believe that the executive officer has the

authority to add new requirements without following that administrative resolution procedure that is now your permit --

CHAIRMAN NAHAI: Mrs. Ansari.

MS. ANSARI: -- or what to do to reopen the permit?

CHAIRMAN NAHAI: I've got to stop you.

MS. ANSARI: I am sorry. I didn't pay attention. I apologize.

CHAIRMAN NAHAI: You have to set an example here as an elected official.

MS. ANSARI: I know. I totally didn't look. Listen, I have to leave, but I wanted to present you this plaque from the City of Diamond Bar for your 50 years of dedicated service. And one statement, Dennis has tried to work with cities.

CHAIRMAN NAHAI: Thank you. It's beginning to feel like 50 years just today.

The next three cards that I have are from Mr. Mark Pisano, Mr. Mike Bonin and Mr. John Claussen.

MR. PISANO: My name is Mark Pisano. I'm the Executive Director of the Southern California Association of Governments. We're the Metropolitan Planning Organization for Southern California. We do growth, transportation, planning. We're also responsible or co-designated to prepare the air quality plan, and finally we are designated as the 208 area-wide management program.

I want to note that prior to my assuming my current position, I was the director of water quality standards planning, nonpoint source programs, waste load analysis for EPA in Washington.

The issue you have before you today is a difficult one. You have been challenged to leave a legacy, a legacy of cleaning up our bays and waterways for nonpoint source solution. My board supports you accomplishing that legacy, but it supports you doing it in a way in which we can be successful and we can be successful in our lifetimes. The program extends 50 to 100 years. To accomplish its objective, it does not accomplish that particular end.

My board also puts before you a proposal to work with you as your 208 area-wide management organization to accomplish your goals. That was intended by the statute, and we would like to work with you. We've made various offers over the past ten years to work with you. Those have not been taken up either through resources or through agreements.

Very specifically we proposed three very definite actions. The first is that we enter into a memorandum of understanding with you to incorporate best management practices into our livable communities guidebook, handbook that is helping us to implement the transportation air quality provisions. We have resources to accomplish that.

R0072078

We work with the Tree People in preparing

the best management. The BMP handbook, we would like to see that incorporated and, secondly, for us to move forward on a scheduled implementation of those BMPs that are not high cost, that we can clearly justify because they achieve multiple objectives.

Secondly, to enter into a multi-agency process for undertaking watershed planning activities that would enable us to determine multiple goals and the solution to multiple goals within basins. We have a model of such a watershed plan occurring in one of our subregions, namely, the Calabasas subregion, working on the Malibu Creek storm water problem. We urge that as a model.

And in so doing, we would suggest we put together an interagency collaboration of the Corps of Engineers, the Department of Interior, CalTrans, and we've had discussions with these agencies, and they are interested.

Thirdly, with respect to numerical standards, we support technically based, environmentally based, setting of standards. Very specifically, we're supportive of a TMDL supported numerical standard where we need to go further in order to achieve air quality.

R0072079

The implementation of those three steps would allow us to develop the information base so that we can have three things, and I'll close with this: We can have a partnership so you can bring together the

resources necessary to solve this problem. We'll have an educational program so people can see what they're getting for their investment.

And, finally, we would get the needed resources. Without resources, we're not going to solve this problem. If you pit the units in our region against one another, you'll put us further behind and not achieve your legacy. If we cooperate, if we collaborate, and if we integrate our various resources, we'll achieve our goals. Thank you.

CHAIRMAN NAHAI: Thank you.

Mr. Bonin.

As I call out your names, if you'd come up and maybe occupy one or two of these seats up here so that you'll be in the position to step up to the podium right away, that would be helpful as far as time is concerned.

MR. BONIN: Good afternoon. Thank you for your time. My name is Mike Bonin. I'm the Director of Community Affairs for Los Angeles City Councilmember Ruth Galanter, who represents the Sixth District in Los Angeles, including a good portion of the city's coastline.

R0072080

I want to clarify who I'm speaking for today. I'm speaking on behalf of the councilmember and a bit later I guess you're going to hear from Gary Moore, who's from the City Storm Water Program who will explain in more detail the city's official position as

taken by council action tomorrow.

I'm briefly going to do two things. That is, one, give a context to the council's position taken yesterday and a little bit of an overview of the process and then say a few words directly on behalf of the councilmember.

The council action yesterday -- I missed this morning a comment that I was a bit shocked to hear that council may not have understood exactly what they were doing yesterday. On the contrary, the council knew exactly what they were doing. The reason the council took an action yesterday is that back in October, city representatives gave some testimony to the board that the council was concerned with, so the council spent the intervening months weighing their options and figuring out exactly which position to take.

Yesterday the council debated for 40 minutes. In comparison to what you're doing here today, it doesn't seem very long. But that's longer than about 90 percent of the issues that council hears, and it was the longest issue the council debated yesterday.

R0072081

They heard from varying different sides of the issue. They heard some very strenuous testimony from the city's chief legislative analyst who urged the council not to take as strong an action as they did, and the council decided to take an entirely different

action. The council decided to make a very emphatic statement on behalf of the proposal before the board on behalf of the 85 percent, three-quarters inch rule.

The council did have some concerns, which they did express and some questions they would like answered by the board. The council, however, made it very clear that their support for the proposal was not contingent upon having those questions fully answered or fully resolved. That would be nice, but the council is more concerned with seeing some action taken and let's work out some of the details later.

So please do not misunderstand yesterday's council action as some sort of whispered sweet nothings to the environmental movement. It was a bold and declarative statement to take action and on behalf of environmental leadership and an expression of willingness on the council's behalf to assume the mantle of that leader.

Another indication of the seriousness of the council's action is that it was a consensus statement. Had the council just acted willy nilly on my boss's recommendations, it would have been an even stronger statement. **R0072082**

Councilmember Galanter, in a letter sent to you yesterday, endorses some of the -- endorses fully what NRDC and Heal the Bay and the BayKeeper are saying. Most emphatically, the issue we would urge you to look at is the issue of the roofing exclusion. We

think that guts the proposal, and the councilmember would urge you to seriously consider removing that exclusion and restoring some of the meat and the muscle of the proposal before you.

So, again, if you want some more specifics on it, Gary can testify a bit later, and I'm available for questions at whichever opportunity. Thank you.

CHAIRMAN NAHAI: Thank you very much.

There's a question for you, Mr. Bonin.

MR. BONIN: Yes.

MS. CLOKE: I'm confused. I have here a letter from Ron Deaton.

MR. BONIN: Yes.

MS. CLOKE: Who's speaking for the city asking something that is very different from what is in the motion that your boss signed, so can you clear up this confusion for me?

MR. BONIN: Yeah. What's the -- what needs clarification precisely?

MS. CLOKE: Well, he's saying that the City of Los Angeles is asking for an extension. R0072083

MR. BONIN: There was some testimony to council yesterday primarily by Councilmember Mark Ridley-Thomas, who said that it would have been nice if we could have another 30 days because the latest proposal came out on January 18th or something like that, and there were some councilmembers that shared

that sentiment.

But as I said that the council concern to have some issues resolved or to have some questions answered was very clearly stated and affirmed yesterday as not something that was conditional for the city's support. Oftentimes, the council will make -- take a position on behalf of something before the legislature and say, "We will support this only if amended." That is not the action that council took yesterday.

Does that answer it or not?

MS. CLOKE: I -- have you read Mr. Deaton's letter?

MR. BONIN: Yes, I've read Mr. Deaton's letter and the council action on which his letter is based, which is the ultimate authority that is before you. So if there's a difference, I'd refer you directly to the council action on which his letter is based.

MS. CLOKE: So this is the substitute motion 44A which is signed by Galanter?

MR. BONIN: Signed by Councilmember Galanter, seconded by Councilmember Feuer, was approved unanimously by the council yesterday 12 to nothing.

MS. CLOKE: This motion, shouldn't we have the city clerk's stamp on it or something to identify that this is the official --

R0072084

MR. BONIN: Yes, that is the official statement.

MS. CLOKE: It's not that it was introduced and then it wasn't passed?

MR. BONIN: No. That was introduced and that was passed unanimously.

MS. CLOKE: Thank you.

MR. BONIN: Anything else?

CHAIRMAN NAHAI: Thank you.

The next speaker is Mr. Claussen, and after Mr. Claussen I'd like to hear from Mr. Fred Phillips, Mr. Rufus Young and Mr. Ron Wilkiness, please.

MR. CLAUSSEN: Good afternoon, Mr. Chairman, members of the board and Mr. Dickerson. My name is John Claussen, and I'm here today on behalf of the California Restaurant Association and its members in Los Angeles County.

Before I begin, let me just point out that our letter to the board dated January 14th, our detailed comments are inadvertently omitted from your board packet, so Robyn was good enough to distribute that this morning. If you don't have it, I have extra copies.

The CRA is aware of the numerous water quality issues facing California and is interested in working with the board, the Corps Committee and the stakeholders to develop and establish fair and effective regulations to address these issues.

R0072085

The CRA has worked with its members and

the board staff to address concerns specific to the restaurant industry found in the proposed rule, and we've outlined a number of these concerns in our January 14th letter. Through the work of the board staff, some of these concerns have already been addressed, but today I'd like to highlight three of our outstanding concerns.

First, the CRA supports SCAG's proposed Clean Water Initiative and requests that the board defer action on the proposed rule if it includes the numeric standard. As stated in our written comments, we believe that there's a lack of data demonstrating that the required numeric standards are cost effective for our industry or provide additional benefit to the beneficial uses of receiving waters.

Furthermore, the CRA has always believed that the Los Angeles County Department of Public Works' Program of BMPs and inspections, which are similar to those source and structural BMPs contained in the SUSMP rule when applied to our industry are adequate and can provide an effective means of preventing the discharged pollutants to the storm drain system without the need for numeric standards.

Second, we are concerned that the real language regarding redevelopment is still too vague. In our written comments, we proposed that the definition of redevelopment only apply when there was a 50 percent increase to the size of an existing

R0072086

restaurant.

The January 18th staff report recognized this concern stating that the creation or addition -- the definition of redevelopment would be changed as to apply only to the creation or addition of 50 percent or more of impervious surfaces or the making of improvements to 50 percent or more of the existing structure.

The report also states that this change ensures that minor modifications to existing structures for properties do not unintentionally trigger SUSMP requirements. Since the rule does not define improvements, one can now interpret this definition as requiring the rule to apply to existing structures if a restaurant owner performed any number of improvements, which would have no impact on the generation of pollutants discharged to the storm water system, such as replacing flooring material or redesigning or revising the motif of the restaurant, et cetera.

And, finally, our written comments express concern about the applicability of the SUSMP rule to the small -- to small parking lots. The January 18th staff reports states that it is staff's intent that the SUSMP revisions not apply to parking lots associated with small commercial developments but only the commercial stand alone developments for parking lots.

R0072087

However, the language as stated in the

change sheet does not achieve this objective, and the rule remains vague as to the applicability to small commercial lots, and we hope that the staff will clarify this in their final rule, and that's it.

Thank you for our opportunity to comment on the staff's proposed SUSMP rule. We trust that these comments will help the board to develop a fair, effective and consistent rule while considering the needs of the restaurant industry.

CHAIRMAN NAHAI: Thank you very much.

Why are the lights not working?

MS. GOODMAN: It was working.

CHAIRMAN NAHAI: It's off now?

MS. GOODMAN: Yeah.

MR. CLAUSSEN: Do I have more time?

MS. DIAMOND: I have one question for you. Would you know, as a member of the restaurant association, what percentage of restaurants in this area are small as defined by our definition of small restaurants?

MR. CLAUSSEN: Yeah. Actually, I heard your question this morning, Miss Diamond, and I actually don't know the exact answer to that question. The CRA represents primarily the larger commercial chain type of restaurants. We represent over 700 operators in Los Angeles County. Most of those, as our guess, based on the property lines will exceed the 5,000.

Our understanding is that the 5,000 square footage exemption is for the smaller mom-and-pop-type stores, which don't generate the potential for the pollutant sources to storm water. But I don't have the exact number or percentage of restaurants that will be affected by that.

MS. DIAMOND: Thank you.

CHAIRMAN NAHAI: Thank you very much.

Mr. Phillips.

MR. PHILLIPS: Good afternoon, Mr. Chairman and staff. Thank you very much for taking time to listen to many different points of view on this matter. My name is Fred Phillips. I'm the Development Manager for the Western Region for Burger King Corporation, and I'm representing not just my own company, which has about 300 restaurants in Los Angeles County run by a hundred individual franchisees, but really for, as you had mentioned, Miss Diamond, the smaller restaurant operators within Los Angeles County because there are several thousand that would come under this particular rule.

I want to just kind of put more of a face on how this is all going to affect us as stakeholders on this. We have studied this very carefully. We have worked with Mr. Claussen at the CRA, and we do have some things we'd like to bring up about this.

R0072089

Again, most all the new restaurants that are built in Los Angeles County and in the nation, in

fact, meet these BMP standards. The issue that we have is with the numeric standards because it is something that we have never had to deal with before as an industry.

And the cost of implementation to us are still so vague from the information that we've received, the issues of filtering devices is the one that we're the most concerned about because we're basically taking a new type of a product and we're implementing into a situation that our restaurant operators and restaurant operators in general are not familiar with.

You're talking about a product or an item that has to be installed, and we have heard some of the prices quoted that it's about $500 for this and so forth. You start multiplying that times the number of catch basins you need inside of a regular parking lot, and you add to that the cost of maintenance, and since there is no proven track record for something like this in a small operation, this is not something that restaurant operators are going to want to deal with.

You can have potential toxic issues involved, and we are governed by the AQMD and health departments and so forth, so this is going to require outside vendors to come in, and we can take care of this forever, basically, with no idea of what this cost is going to be in the long run for us.

R0072090

To top that off, the other issue about

remodels is a very interesting one. It was very vague the way it was written. It said as long as the cost is 50 percent -- it didn't exceed 50 percent. Fifty percent of what?

If you remodel a restaurant -- and many of our restaurants are 10 or 15 years old. The cost of developing a restaurant 15 years ago versus now, when you implement issues such as ADA rules, you're automatically spending an inordinate amount of money into remodeling a restaurant, so we could easily exceed that 50 percent rule just by doing a simple remodeling to a restaurant.

So, again, how does that figure? Is it current cost? Is it old cost? What is it? These are issues that there really isn't anything covering it in this piece.

And, finally, in a restaurant that did not have drainage issues, you know, a 2500 foot restaurant with maybe a 15,000 or 20,000 foot lot, when they were built, there were no standards for this. It would drain directly into the street.

Would they then be required by exceeding this cost just by doing a remodel and adding 88 restrooms to their building have to dig up their parking lot and spend what we've figured between 15- and $20,000 to go in, dig it out, regrade it, redrain it and close the restaurant, losing sales and so forth during that time period?

So it's not a very simple issue we're looking at. We're looking at something that is a long-term cost to our organization on our people.

CHAIRMAN NAHAI: Thank you, Mr. Phillips. I had a question to ask you.

But, first, does anybody else have any questions?

MR. PHILLIPS: I can answer any questions you have about restaurants throughout the afternoon if you need them.

CHAIRMAN NAHAI: The Burger King restaurants that you represent are average what size of the 300 here in California?

MR. PHILLIPS: They average between 2200 to 34-, 3500 square feet, and that's about average for a McDonald's, Jack-in-the-Box, a Taco Bell or any small, independent restaurants due to the lot sizes we have in Los Angeles County.

A PERSON: Is that lot size, or is that restaurant size?

MR. PHILLIPS: That's restaurant size.

CHAIRMAN NAHAI: Wait. Wait. The questions get asked from up here, not from the members of the audience. If we allow that, we're going to have a zoo in this room; okay? Please don't do that again.

A PERSON: I'm sorry.

R0072092

CHAIRMAN NAHAI: The other thing that I wanted to just discuss with you is the 50 percent rule

as its proposed. My reading of this is that it doesn't have anything to do with 50 percent of cost. It has to do with the 50 percent addition of impervious surfaces or 50 percent addition of building area.

MR. PHILLIPS: But there was -- the way it was interpreted by us in reading it that it could be interpreted as cost of improvements to the building, and improvements to the property is very vague in that does it mean you're adding on 50 percent additional square footage, or is it talking about that? And it was interpreted by some reader that it could be interpreted that way by local government.

CHAIRMAN NAHAI: I'm having difficulty with that. Let me just read it to you. "Redevelopment means on an already redeveloped site the creation or addition of 50 percent or more of impervious surfaces or the making of improvements to 50 percent or more of the existing structure."

MR. PHILLIPS: "Making improvements of 50 percent or more of the existing structure," 50 percent of what? So in other words --

CHAIRMAN NAHAI: My question is: How could anybody possibly interpret that to mean a cost calculation?

R0072093

MR. PHILLIPS: Okay. If it says "50 percent or more of the structure," you mean 50 percent or more improvement or changes or remodeling to the structure; is that the way you understand it?

CHAIRMAN NAHAI: I mean, I just -- I didn't understand how cost was built into this formula, and so I just wanted to point that out to you.

MR. PHILLIPS: I guess the understanding would be is that's the question. 50 percent. If we go in and tear off the roof and put a new roof on the structure and we put in new plumbing and new bathrooms and so forth, we will have expended -- we will have spent more than 50 percent of work to a building that we almost have torn it down, where we might not have touched the parking lot. We might not have touched the landscaping. But we've easily exceeded 50 percent improvements to the property, and that's the question. How does it get interpreted? It was very vague.

CHAIRMAN NAHAI: Okay. Any other questions? Thank you very much.

MS. CLOKE: You will be around to answer anymore restaurant questions?

MR. PHILLIPS: I'll stick around. I've been a consultant in the restaurant business for 14 years, and I've had to deal with these situations in the past.

CHAIRMAN NAHAI: Excuse me. Mr. Bob Miller had a question for you.

MR. MILLER: The question was in that same language, are you talking about 50 percent of the area of the restaurant being increased or the percent of -- I'm not sure.

CHAIRMAN NAHAI: My only point was that it doesn't talk about 50 percent of cost. It talks about either 50 percent --

MR. MILLER: Of impervious areas.

CHAIRMAN NAHAI: -- or an addition.

MR. MILLER: 50 percent of what?

CHAIRMAN NAHAI: Of the 50 percent addition to the area.

MR. MILLER: Of the area. Okay.

CHAIRMAN NAHAI: It's not -- what I'm saying is that there is nowhere in that paragraph -- Mr. Phillips's interpretation of it was -- or those people who have spoken to him about it, their interpretation was that if you -- if something costs you a hundred thousand bucks to do it and now you're going to do a $60,000 addition, that that is the criteria for whether you'll have to comply.

MR. MILLER: All right.

CHAIRMAN NAHAI: And all I was saying is that it's not based on that.

MR. PHILLIPS: And just to reclarify my position here, I think the point I'm making isn't simply with regard to cost. I'm saying as a result of that work, you'll be expending a cost that would be a higher number than even what you're involved with building the restaurant. So you certainly would have spent more than 50 percent of work to the building that would have been done just by doing a simple remodel to

meet current codes.

CHAIRMAN NAHAI: Mr. Young.

MR. YOUNG: Mr. Chair, members of the board, my name is Rufus C. Young, Jr. I'm with Burke, Williams & Sorenson, a law firm which proudly represents the cities of Alhambra, Compton, El Segundo, Hawthorne, Lomita, Industry, Torrance and Santa Clarita in this matter, and each one of those cities objects to the limitation of three minutes per person, rather than three minutes per entity.

While we represent eight cities, those cities have interests in common, but they have some issues that are different from one another. We submit that denying the cities the opportunity to have three minutes per city, limits the cities to 22 seconds per city. That denies them procedural due process and the right to be represented by counsel.

Moving right along to the second item, lack of adequate notice. The cities in each of them objected to the lack of notice because this SUSMP has evolved significantly, recently. As recently as the 18th and as recently as the release of the change sheet. That left no adequate time to analyze or to address those changes.

R0072096

Third, the redevelopment threshold, and this is on behalf of the cities of Alhambra and Hawthorne. The 50 percent existing structure that was just discussed by the previous speaker, we suggest that

it lacks a nexus to storm water and that the requirement would be significantly strengthened if the 50 percent or more threshold were added to include 50 percent or more that would adversely impact storm water.

Take the situation where the improvements are all interior redecorating improvements over the entire -- on the entire interior of the structure. No adverse storm water impacts at all.

Fourth, the implementation date. This is on behalf of the City of industry. We suggest that there be a grandfather provision that Mr. Dickerson alert -- mentioned this morning. We applaud that and suggest that those projects for which the application has been filed and accepted by the permitting city but not -- no final action has been taken yet, that those be grandfathered if the application was filed and accepted within 180 days of the adoption of the SUSMP implementing ordinance by the permitting city.

Next, and this is on behalf of the city of Santa Clarita, the issue of clustering redevelopment or development in conservation habitat areas. We suggest that there be a modification to the first bullet, and I believe this is Item 2 on page Roman numeral II-7 of the December whatever it is version. That when feasible there be a requirement to cluster the development in or near conservation areas.

R0072097

Next point, the parking lot size, and

this is on behalf of the city of Alhambra, we suggest that the parking lot threshold be given a credit for those parking lots which incorporate a parking lot island which is vegetated, which is the best management practice. If you vegetate your parking lot islands, that shouldn't count against your 5,000 square foot limitation.

Next, on behalf of the cities of Industry and El Segundo --

CHAIRMAN NAHAI: I have to stop you, Mr. Young. I apologize. I've got to stop you. It's well over three minutes.

MS. CLOKE: We have your letter.

CHAIRMAN NAHAI: If there is time at the end, I'll ask you to come back to the podium. We have several letters from you and you've made your points very eloquently in those letters as well.

MR. YOUNG: Well, I continue with my procedural objection of 22 seconds per city is simply not adequate. Thank you very much.

CHAIRMAN NAHAI: Duly noted.

MR. YOUNG: I'll be back.

CHAIRMAN NAHAI: Mr. Wilkiness.

MR. WILKINESS: Good afternoon, Mr. Chairman -- pardon me -- and members of the board. Excuse me. My name is Ron Wilkiness. I'm with the Western States Petroleum Association, the trade association for the oil industry in the west.

Many of my member companies, as you might imagine, will be building or remodeling service stations that will be impacted by these SUSMPs. My comments are specific to the requirements for retail gasoline outlets, unique, I think, among the nine categories of planning projects that have been identified. I appeared before your board twice last year to comment on the city of Long Beach permit and again on the proposed SUSMPs.

On both occasions, I told you that as an industry we have participated in the development of an RGO Storm Water BMP Guide published in 1997 by the California Storm Water Quality Task Force. The requirements of that guide have already been adopted by various agencies in San Bernardino County, in the Bay Area and here.

Your board incorporated the requirements of the task force BMP Guide into the Long Beach permit. This is my understanding from reading the staff report that the staff is proposing to require that new or redeveloped RGOs shall meet the provisions of the Task Force BMP Guide but not the numerical standard. That's on page 12 of the staff report. Where a service station operates its service bays, additional BMPs would apply.

R0072099

I believe that a number of companies can support these requirements; however, first, there are two issues for which I would seek clarification. One,

as I read other language in the December 7th document and also in the staff report, there are at least six sets of statements that conflict and might lead the permittees to a different conclusion about their requirements. I believe that the intended requirements are those as stated in the paragraph on RGOs on page 12 of the staff report.

Secondly, the proposed SUSMP on page 11 lists the requirements for the proper design of WSPA maintenance bays. I assume too that these are the, quote, "additional requirements" referenced in the staff report on page 12. I would appreciate it very much if staff could please clarify these two questions for me, but I hope, Mr. Chairman, not at the expense of my three minutes.

CHAIRMAN NAHAI: Yeah. I think if we may, let us note your questions and we will ask them of staff at the end. I don't want to interrupt the flow of speakers by having speakers pose questions to staff.

MR. WILKINESS: I'm at somewhat of a limitation, Mr. Chairman, because I'm not sure really what my comments should be since I'm unclear on the requirement because of the conflicts in the staff report and the December 7th document.

R0072100

I would like to ask that the staff, please, revise the final version of the SUSMPs to ensure the applicable requirements for RGOs are crystal clear and consistent with page 12 of the staff report.

I also suggest that it would be appropriate for the staff to list the Task Force BMP Guide as one of the references in Table 1 of the SUSMP.

In conclusion, I have a small amount of legal fine print that I would like to add. Because of the earlier proposal that numerical design standards also be applied to new or redeveloped RGOs, WSPA requested that its attorneys determine whether there would be any associated legal issues.

Although staff's apparent abandonment of that proposal may make the legal analysis no longer relevant, it still might be of interest to your counsel, and, accordingly, I would like to hand it in for inclusion into the record of these proceedings. Thank you. I would be happy to answer any questions that board members might have.

CHAIRMAN NAHAI: Thank you very much for coming.

MR. WILKINESS: Thank you.

R0072101

CHAIRMAN NAHAI: The next three cards that I have are -- I have one from Mr. Montevideo, but he's already spoken for three minutes.

MR. LEON: Mr. Nahai, I'm sorry. Quick housekeeping issue with respect to the request that he just made. He requested an opportunity to submit what I take to be, basically, a legal argument by counsel before the close of the record, but as I understand it we're going to be closing the record of this matter

today.

Do we need to make an arrangement for him to submit something after the close of the record, or is the permission that is granted based on --

CHAIRMAN NAHAI: Isn't it being submitted at this time?

MR. LEON: I don't know.

CHAIRMAN NAHAI: Are you submitting your legal fine print to us now?

MR. WILKINESS: I would submit them with the request that it simply be made part of the record. I think that the legal analysis is superfluous based on my understanding of the requirements, but, again, because of the conflict between the statement of requirements on page 12 of the staff report versus language elsewhere in the staff report and in the December 7th document, there is some uncertainty regarding precisely what requirements are being proposed.

R0072102

If the requirements are the task force -- the California Storm Water Quality Task Force BMP Guide, that is something that we would strongly support.

CHAIRMAN NAHAI: Okay. So you think the legal argument that you're submitting is probably moot, but just in case it isn't, you want to make sure you would have put it into the record.

MR. WILKINESS: Precisely correct.

MR. LEON: Is he prepared to submit it now?

CHAIRMAN NAHAI: He already has.

MR. WILKINESS: Yes. I already have.

MR. LEON: That's what I needed to know.

MR. WILKINESS: I apologize for any confusion. Thank you.

CHAIRMAN NAHAI: The other cards that I have are from Mr. David Freeman, Mr. Tim Piasky and Mr. Ray Tahir.

MR. FREEMAN: Thank you, Mr. Chairman, for the opportunity to speak. I'm Dave Freeman, the General Manager of the Los Angeles Department of Water and Power. I'm on leave from that job for the time being, return on May 8th.

And I'm speaking for myself today as a person that's been a part of this water pollution crusade, if I can put it that way, ever since the early seventies. I was present at the creation of the Environmental Protection Act and the passage of the Clean Water Act.

I ran the Tennessee Valley Authority as a polluter and learned what it was for the EPA to crack down on me and require us to put technology that we thought was yet unproven in to clean up the air and we did it.

R0072103

And I have worked here -- in Texas, I implemented a nonpoint pollution ordinance in 1988.

And if you think this is tough, I wish you had been with me there. That's a state where the freedom to use your land the way you wish is a fairly righteous thing, and it was not a pretty sight. But we got it approved, and it's been implemented, and it's been quite successful in keeping Lake Travis and those waterways a whole lot cleaner than they would otherwise be.

Let me just try to make two points here. One, I know this seems like a tough thing for you all to do, and I know that there's a lot of opposition because this is kind of new to Southern California. But with all due respect, you're taking a very small step very late. This is not a pioneering effort.

People all over the country -- if you required other folks to have open space all around their place, put a catch basin in, a filter bed, to do a few simple things that retain 75, 80, 85 percent of the pollution that would otherwise go in, that is just no big deal.

Now, the polluters will always make it seem like a big deal, and municipalities and federal agencies like I used to run are more prickly about obeying environmental laws than private companies because they're used to giving orders and they're used to passing ordinances, and they really don't like it when some other agency hands down something that they've got to do, but it's the law, and it's happening, and it's not that big a deal.

R0072104

The plain truth of the matter is we know this pollution infects our water. That's not questionable. And we know where it's coming from. We passed a lot of environmental laws with a lot less knowledge than that, and all you're doing is attacking the growth, which may be 3 or 4 percent a year. Ten years from now, you will have done maybe a third, at the most, of the nonpoint pollution if you were able to get a hundred percent.

So you're landing in Normandy, and if you leave enough loopholes in the forces so that pollution can come driving through your forces, you'll be back in the sea again. You have got to at least make this landing in Normandy a strong one and a strong base.

All these exceptions they're talking about, all those things need to be disallowed. The issue is who's got the burden of proof? That side loses. And you need to have these people come in with factual demonstrations to you to justify any waiver or any exclusion. Thank you very much.

CHAIRMAN NAHAI: Thank you very much.

Mr. Piasky.

MR. PIASKY: Thank you. Good afternoon, Mr. Chairman, members of the board. My name is Tim Piasky representing Los Angeles County Department of Public Works. The County of Los Angeles is not opposed to the idea of the SUSMP. However, we feel the current version has several technical deficiencies as we have

brought forward in our submittal letter today as well as our letters to Dennis Dickerson dated December 28th, 1999 and January 11th, 2000.

We have concerns with all these deficiencies. However, the proposed definition of "environmentally sensitive area" has us gravely concerned. This definition is very difficult to interpret and could be interpreted to cover almost all development. This definition would also be very arduous to implement and enforce.

According to the staff report and record of decision dated January 18th, 2000, a sensitive coastal resource area would include highly scenic areas and areas possessing significant recreational value. These are very subjective categories without clear definition.

Instead, we would recommend defining an environmentally sensitive area by those adjoining, bisecting or directly discharging to a significant ecological area identified by Los Angeles County or other environmentally sensitive areas identified by a legislative body.

If this definition is not used, then we would recommend that the Regional Board staff provide a readable meets and bounds support and map instead. Thank you.

R0072106

CHAIRMAN NAHAI: I have a question to ask you, if I may. The definition of "environmentally

sensitive area" that I'm looking at says it means, "An area that's designated as an area of special biological significance by the State Water Resources Control Board, Water Quality Control Panel, Los Angeles Region Basin Plan or an area designated as a significant natural area by the California Resources Agency or an area designated as an area of ecological significance by the County of Los Angeles."

So it's talking about any area that is really designated as such either by the State Water Resources Control Board, by the California Resources Agency or by the County of Los Angeles. What am I missing? What's wrong with that?

MR. PIASKY: Well, again, the definition is very broad, and I think there's a lot of confusion as to what area that really covers. It could mean to cover almost all development. You know, nobody's seen a map that overlays all those areas to see what it is exactly we're talking about.

CHAIRMAN NAHAI: I know. But help me out here. There would have been a reason, would there not, why the County of Los Angeles would designate an area as an area of ecological significance.

MR. PIASKY: That's right. But that's only one area that's defined in there as your SCA. There are other areas that are also included. So you have to take all of those areas into effect when you're determining the definition.

CHAIRMAN NAHAI: Yeah. But each of those areas would have been designated as such either by the CRA, by the County or by the State Board.

MR. PIASKY: That's right. But we still don't know what the overlay is for all those areas. It could impact almost all development in L.A. County.

CHAIRMAN NAHAI: Okay. Any other questions of Mr. Piasky? Thank you very much.

Mr. Tahir.

MR. TAHIR: Chairman Nahai, would it be possible to allow me to trade with Councilmember Bruce Barrows who's also representing the Gateway Cities Club this afternoon. He's been waiting here for the last four or five hours, and I'd like to give him a chance to speak so that he can attend a meeting.

CHAIRMAN NAHAI: You're just trading places --

MR. TAHIR: Just trading.

CHAIRMAN NAHAI: But three minutes each.

MR. TAHIR: Yes, sir.

CHAIRMAN NAHAI: All right. No problem.

MR. BARROWS: Thank you for allowing him to switch for me. I do represent the city of Cerritos. We have taken a position on this as has the Gateway Cities Council of Governments. I do have a resolution that was passed on January the 5th I believe it is.

CHAIRMAN NAHAI: Could we have your name for the record?

MR. BARROWS: Yes. It's Bruce Barrows, Councilman, city of Cerritos.

Our main concern deals with the numerical issues, and I don't really want to go back in and revisit what everybody has said before me. But we do have concerns over that.

And I do recognize that earlier one of our members of our congress mentioned in supporting numerical standards and things like that. That was Southgate. Southgate has not taken any such position. That was -- according to the city manager, an individual had wrote a letter on city stationery, and that's a phone call that was confirmed earlier this morning. So I just wanted to clarify we don't have support on that.

The third thing to come up is as I sit here listening -- this is the first time I have been to one of your meetings, and I appreciate all the work that you're doing. I know it's a lot of work, a lot of prep and a lot of difficulties to find the resolutions.

The Gateway Cities Council of Government stands for very, very difficult economic issues that we're working on, we're doing some studies on, and were described in some very unflattering terms in parts of the area in terms of the job losses. The jobs that are missing are still below the 1989 levels. **R0072109**

We have some of the most dense cities in the nation in any county in the state. Our concerns

deal with it. These controls that are going to go in are probably going to cause some economic hardships. You know, we're not Santa Monica that has a beautiful view of the ocean. There are some cities there that have some very, very grave difficulties to overcome. We want to be sure that we have standards that we can live with.

All the cities -- our position as a council is that we're very concerned about the environment. We worked very hard on the San Gabriel and the L.A. Rivers Conservancy that was just signed into state law.

So we're not saying we're against what you're working on. We just want to make sure that we have a resolution that you come to that we can live with. And we thank you very much for the three minutes.

CHAIRMAN NAHAI: Thank you very much.

Any questions?

MR. BARROWS: Who do I submit this to?

CHAIRMAN NAHAI: To the executive assistant.

Did you have a question, any other questions?

R0072110

Thank you so very much.

The next three cards are from Mr. Arturo Cervantes, Mr. Bruce Fane and Mr. Marvin Sachse.

MR. CERVANTES: Good afternoon. My name

is Arturo Cervantes. I'm an engineer with the city of Vernon, and I just want to read a very brief statement to state our city's position on the SUSMPs.

The city of Vernon does not agree with the proposal to incorporate a numerical design standard into the SUSMPs without following the procedures as outlined by the permit. Based on the information given by the EAC presentation team, the city is asking that the Regional Board do what is correct and not approve the SUSMPs.

The city supports protecting the beneficial uses of the receiving waters. However, before costly numerical design standards are incorporated, the city agrees that a study must be conducted to identify which groups of the SUSMPs are for beneficial uses and which BMPs can effectively mitigate the potential impacts. This will ensure that we are directing our resources to meet the intended goal of the permit in protecting the beneficial uses of the receiving waters. Thank you.

CHAIRMAN NAHAI: Thank you very much.

MS. TEAFORD: I'm Bonnie Teaford with the city of Burbank. Bruce Fane had to leave and I was his alternate speaker.

CHAIRMAN NAHAI: You don't look like a Bruce Fane.

MS. TEAFORD: I don't, do I? **R0072111**

I'm Bonnie Teaford. I'm the city

engineer with the city of Burbank, and we are here representing the Arroyo Verdugo Council of Governments whose members include the cities of Burbank, Glendale and La Canada Flintridge.

And my purpose today was just to submit to the board formally the resolution that was adopted by that Council of Governments on January 21st, 2000, and that has been entered into the record. The resolution was entitled "Resolution of the Arroyo Verdugo Cities Council of Governments Advising the California Regional Water Quality Control Board, Los Angeles Region, of Its Intention to Petition the State Water Resources Control Board for Relief from Unreasonable Runoff Pollution Controls for New Developments."

We really appreciate the opportunity for dialogue today, and we look forward to working with the board on a mutually acceptable resolution of the issues. Thank you.

CHAIRMAN NAHAI: Thank you.

Mr. Sachse.

MR. SACHSE: Okay. Good afternoon, Chairman Nahai and board. Thank you for your time. Happy anniversary. I have copies of my prepared spontaneous remarks, which I'll give out after my presentation.

R0072112

My name is Marvin Sachse. I'm a state licensed professional engineer with a master's degree

in environmental engineering and industrial engineering. I'm the program manager for State Approved Storm Water Groups serving 300 Southern California auto recyclers and their trade associations.

As a group, we wish to place before the board our concerns that the well-intentioned SUSMP program will be compromised by the use of numeric limits. Recommended SUSMP program BMPs were derived from East Coast studies with very few actual installations and less hard data.

One concern with numeric limits is the litigious nature of the Clean Water Act will expose every SUSMP installation to lawsuits over the term "maximum extent practicable." Clearly defined effluent limits will eliminate the potential for unending litigations from this vague and inexact term. TMDLs will establish clearly defined effluent limits.

The Sacramento Storm Water Management Program published a November 1999 final report. This report data showed that under some conditions, total suspended solids and zinc are discharged from grassy swales and sand filters increasing pollutant loading in storm water treated by these BMPs.

Moreover, there were 14 BMPs evaluated, which were similar to the ones in the SUSMP program. Thirteen were rated not acceptable. Only one was conditionally acceptable. The Sacramento report estimated that the installed unit cost would range

R0072113

between $20,000 and one-half million dollars, depending upon treatment technologies. Operation and maintenance costs range between $400 and $4,500 per year.

Los Angeles is a desert. BMP effectiveness data has not been obtained from cities with similar weather patterns, soil conditions, rainfall and topography. Heavy metals, pesticides, fertilizers, fecal coliform are pollutants of concern and would not be significantly reduced by the SUSMP numeric limits because these particular pollutants are not generated at the targeted operation sites.

Porter-Cologne requires the water board to evaluate beneficial uses of waterways and determine what pollutant loading will not impact the beneficial uses of the waterway. This issue is not addressed in the SUSMPs or its numeric limits, but it is required as part of the TMDL process.

The SUSMP program numeric limits were developed without a scientific basis as to receiving water capacities, pollution from nonpoint sources and determination of BMP effectiveness. It is our recommendation that the L.A. Water Board consider expedited development of the TMDL program instead of implementing a parallel, albeit less well developed, SUSMP program. **R0072114**

The TMDL program provides the necessary scientific tools for the implementation of thea Storm Water NPDES program and affords the best protection for

the environment, watershed residents and businesses than the numeric limits of the SUSMP program. Thank you for your time.

CHAIRMAN NAHAI: Thank you, Mr. Sachse.

Any questions?

Okay. The next three cards I have are Mr. Lambros, Mr. Sucilo from PSOMAS and Mr. Watson, Mr. Richard Watson.

MR. LAMBROS: Mr. Chairman, members of the board, good afternoon. I'm Richard Lambros, the Executive Vice President of the Building Industry Association of Southern California.

Our association represents over 1850 member companies from throughout the six Southern California county area who are actively engaged in various aspects of the building industry. Our membership is primarily comprised of home builders who collectively build over 70 percent of the new homes in our region and who employ over 200,000 individuals in the construction trades.

Our interest in the SUSMP proposal is twofold. First, we recognize that ours is probably the leading industry that will be regulated under this plan and the one called upon to design, construct and maintain the BMPs necessary to achieve storm water mitigation.

R0072115

Second -- could you put up the second slide, please. Second, our industry strongly supports

the goals of enhanced water quality and improved storm water management. After all, when we sell homes, we recognize that we're not just selling four walls and a roof. We truly are selling a quality of life, and that quality of life is enhanced by a clean and safe environment. Clean water is certainly a part of that equation.

Our industry's commitment to water quality is already evidenced by activities such as our ongoing implementation of the statewide construction activity permit, our member education programs designed to educate our work force on the importance of storm water management and our new home buyer education program, which is designed to educate consumers as to how they can protect and preserve clean water, voluntary program by our industry.

As for the SUSMP proposal that is before the board today, we view it in two parts, much as Mr. Dickerson outlined earlier: A SUSMP, BMP component, and a numerical standard. In general, our industry supports the SUSMP BMPs in the proposal. There are a few minor changes that will be outlined later for you by Mr. Watson.

R0072116

As for the numerical standards, our industry strongly opposes the inclusion of the SUSMP at this time. Our major concern is that the numerical standard has been offered as the solution before the board has clearly identified the program. This to us

is backwards.

All successful pollution reduction programs, whether you are attempting to clean the air or the water, follow a very logical process. First, you must identify what is the pollution -- what it is that is polluting the environment. Next, identify the source or sources of that pollution, and, finally, bring all of the stakeholders together to develop a strategy to reduce the discharges of those pollutants. This proposal fails on all three counts.

That's why our industry, along with numerous other industries as was just on the board, have come together to support what we have called the Clean Water Initiative. Unlike the SUSMP proposal that is before you today, the Clean Water Initiative is based on qualitative results, not quantitative results, puts its emphasis on pollution reduction, not volumetric measures, makes a strong commitment to clean water, asks for good science from the board staff, articulates a process for producing measurable results based on sound science, invites all of the stakeholders to participate in the process. **R0072117**

Today you will hear from several other members of the building industry. As they speak, please keep in mind that as the industry principally impacted by this proposal, we would very much like to be a part of the fair process that has a chance of actual, measured and scientifically proven success.

Thank you very much.

CHAIRMAN NAHAI: Thank you. Any questions for Mr. Lambros?

Mr. Lambros, there's a question for you.

MS. CLOKE: Your association represents primarily or exclusively home building companies?

MR. LAMBROS: Primarily home building. We do have some light commercial and other builders within our membership.

MS CLOKE: And can you quantify for me the number of new homes that are constructed in this area on an annual basis or however you have that material?

MR. LAMBROS: Over 11,000 in the L.A. area in 1998. That would be L.A. County.

MS. CLOKE: Thank you.

MR. LAMBROS: Thank you.

CHAIRMAN NAHAI: Mr. Sucilo.

Please forgive me. Just carry on. I'm listening to you.

MR. SUCILO: Thank you. Good afternoon, Mr. Chairman, members of the board. My name is Ken Sucilo. I'm a project manager and registered professional engineer in the State of California with PSOMAS. For those of you who don't know PSOMAS, we're a civil surveying information systems engineering firm that serves land development and public agencies.

R0072118

One of the questions that -- at the

request of BIA, PSOMAS was asked to come up with an estimate of project-specific example costs for -- site-specific costs for implementing these water quality measures. These costs are from the perspective of the design engineer, and that's what I'm going to present this afternoon. Basically the purpose, again, is to quantify the total potential costs.

The scope of what we did -- and what I'll do is I'll present the brief results of our analysis -- is to develop preliminary designs based on the criteria and develop cost estimates based on those -- on the draft SUSMP.

One of the things that I'd like to point out is -- in presenting this is that in developing the designs, many of the interpretations or many of the criteria weren't clear, and we had to make some interpretations as to what exactly those criteria were. I was asked by the staff engineers who do the work under me, "How do I interpret certain things?" And in some cases it came down to, "Where is the comma placed in this sentence?" So that's just a comment on the SUSMP as it's written.

R0072119

The information that we'd like to present, again, it was done at the request of BIA, but we believe that it's -- we present it to you for your use and to the environmental community for everybody to use at their discretion.

We looked at three sites. A hundred

thousand foot commercial industrial site -- and for purposes of analyses we assume three acres. The design criteria was taking the first three-quarters of an inch, assuming a capital flood. So that basically captures the first flush of first three-quarters of an inch during the capital flood.

We did not do a roof exemption, and the resulting design was a one foot -- or a 600 foot long swale that's five feet wide. The capital costs, excluding land, for this project was about $10,000, which broke down to a unit cost of $3300.

CHAIRMAN NAHAI: You need to move more quickly.

MR. SUCILO: Okay.

CHAIRMAN NAHAI: You've only got a minute left.

MR. SUCILO: I've only got three examples. I'll be real --

Long-term maintenance is something that was identified, and we had estimated $800 a year, and the land area required was 3,000 square feet.

Next example, please. Thank you. A 7-acre multi-family residential site. Again, the same design criteria applied to this. Our design instead of swale this time was a detention basin. The capital cost for this project was $60,000 at a unit cost per acre of $8,600. Again, long-term maintenance is required, and this does not include land. Although,

R0072120

the land used was 18,500 square feet.

And I'll really quickly go over the last one, which is 500 acre residential site. The same criteria, 8.3 acre detention, filtration basin that passes 47 acre feet of water. The capital cost 1.1 million dollars at a unit cost of $2,500. Land use that would be used would be three acres. Thank you.

CHAIRMAN NAHAI: Thank you very much.

Any questions of Mr. Sucilo?

MS. LYON: Has that information been included in the letter you sent today?

MS. SUCILO: Some of it has been. Some of it we just finished last night.

MS. LYON: I'd like to make sure that we all get a copy of that breakdown.

MS. CLOKE: In some of the other examples that we've seen, the cost of -- the estimated cost of the improvements were shown as a percentage of the total project cost. So if you're looking -- I don't have the examples in front of me, but if you're looking at, you know, 100 units on so many acres of land and you're saying it's going to cost X dollars, whatever that was, what percentage of that is that for the total development cost?

R0072121

MS. SUCILO: We didn't calculate that. We just calculated them on a project-specific basis.

MS. CLOKE: You know, right. Because it's just -- I mean, you know if you're looking at your

personal budget, it's a lot of money. If you're looking at a multi-million dollar development project and it's 3 or 4 percent, it's a different way of understanding it. I just need to have that last piece so that I can understand what your numbers mean. Otherwise, I don't have a meaning, a context to it.

MR. SUCILO: The intent was basically to give data so that you could make that interpretation.

MS. CLOKE: I can't. I need that last piece before I can understand it.

CHAIRMAN NAHAI: Let me ask you this: For instance, with respect to the 500-acre project which was the third of your examples, and I think that you projected a 1.1 million dollar cost.

MR. SUCILO: Correct.

CHAIRMAN NAHAI: Do you -- in the figures that were presented to you, did you have any idea of the value of the project as completed, what the value as completed would be?

MR. SUCILO: Again, we took things from the design engineer, and that might be a question better answered by another member of BIA.

MS. LYON: But before you leave, I want to make sure that what you presented is part of our record.

MR. SUCILO: Well, I can leave it with you.

R0072122

MS. LYON: Could you present that at such

time?

MR. SUCILO: I could leave it.

MS. LYON: Thank you.

CHAIRMAN NAHAI: Thank you very much.

Mr. Watson.

And following Mr. Watson, I'd like to hear from Mr. Charles Gale, Ms. Lynn Jacobs and Dee Zinke I think. Forgive me. The name Nahai has been butchered in so many ways over the years that I don't feel too guilty about that.

MR. WATSON: Thank you Mr. Chairman, members of the board. My name is Richard Watson. I've been involved in the building industry since 1978 and dealing with storm water issues since 1990. My clients include both the builders and the public sector.

We in the building industry can support part of what is on the table today and we oppose part of it. We support the general objectives of the SUSMPs and the use of appropriate risk management practices. We could have even supported the SUSMPs on the table at the September 16 meeting if the numerical standards were removed. We might even be able to support those on the table today with a few changes in policy and elimination of those standards.

R0072123

We have a few specific concerns that I'd like to deal with. The latest change sheet seems to have dealt with two of those. Those are the hillsides development and definition of parking lots. The way

the staff proposed it today does work. Some of the other discussions today I'd like to see not gone back to.

So the one area that we have a real concern with the definition is the third one, the environmentally sensitive areas. Overly broad, unworkable. The proposed definition, as someone else has already said, is very vague, and it's really an example of policy that's not really been well thought out. We support the recommendations of Mr. Desi Alvarez on how to make changes.

Another area of concern of ours is implementation. We need some details on that. When will the proposed requirements be effective? More importantly, how do they relate to the development process? When do they -- when are we not vulnerable to continual change?

Ideally, these SUSMP issues should probably be dealt with at the tentative tract level. That's where we deal with spacial relationships and you can assess the amount of land and the coverage and plan something into it.

R0072124

Another concern that we have is the numerical mitigation measures. The imposition of these without more study, without more -- not delaying study but trying to make the things work in some way is not really good public policy. It's not clear how these proposed standards relate to maintenance or improvement

of water quality, what it does to the beneficial uses. So we object to that.

One that hasn't been mentioned today is the relationship to the general construction permit. Your staff has proposed that that same language be used as a -- excuse me -- as a standard for post-construction under the general construction permit. That really I think is an intrusion on the prerogatives of the state board, and I think that should be rejected.

In conclusion, I'd like to say that we're willing to do our share. We want to have equitable treatment with good science. We don't really want to waste money attacking the wrong thing with the wrong tools, and we don't like being targeted as "low hanging fruit" as Alexis Straus indicated.

I request that you direct the executive director to make changes in the document itself to clean it up, defer any discussion of this numerical mitigation measure and instead move ahead with the Clean Water Initiative, which I think has been passed out to you. That initiative will set up a process in which we can all participate. Thank you.

R0072125

CHAIRMAN NAHAI: Thank you very much.

Mr. Gale.

MR. GALE: Mr. Chairman, if I could, to accommodate our general counsel, switch our spots in our presentation with Tom Morrison. He's our general

counsel. I will take his card when he comes up.

CHAIRMAN NAHAI: Okay.

MR. MORRISON: Good afternoon, Mr. Chairman and members. My name is Tom Morrison. I'm general counsel for the Building Industry Legal Defense Foundation and also the Building Industry Association of Southern California.

I'm here today to remind the board that the fundamental issue here today is process. And by that I mean the process by which the SUSMP is adopted. I want to first echo the legal process concerns raised earlier by Richard Montevideo. Although, I will not repeat the legal arguments put forth by Mr. Montevideo, let me reiterate that the Building Foundation, the Building Industry Association of Southern California believe that neither this board nor Mr. Dickerson have the authority to implement the SUSMP program that is the subject of this hearing today.

Permit 96-054 clearly sets forth the process by which the SUSMP must be adopted. This process must be followed as long as the permit is in effect. The process set forth in that permit has not been followed and staff has failed to come up with a single, valid, legal argument supporting their contention that the process within the permit is no longer applicable.

R0072126

Mr. Leon has not cited a single provision of the permit dealing with why that process is not

applicable after July 30th of 1999, nor has he come up with a single piece of legislative history in the development of the permit itself indicating what process is to be used after July 30th of 1999 if a permit is not effective. He's simply relying on his own opinion. And may I say that by his own druthers he would rather follow the processes involved in the permit, and we would ask that you do the same.

Further, even if the board could do away with the process set forth in the permit, the Building Foundation and the BIA of Southern California believe that the provisions of the Porter-Cologne Water Act preclude the board from adopting the SUSMP proposal put forth by staff today.

Specifically, California Water Code Section 13360 prohibits this board from implementing an order that specifies the design, the location, type of construction or manner of compliance with an existing waste discharge requirement.

The basic thrust of the existing permit is that it lays out on the cities the responsibility to come up with the measures by which they will mitigate their waste discharge. The permit provides a list of BMPs which may be used, but it does not mandate any of those BMPs specifically be used.

R0072127

We believe that by taking the process away from the cities and implementing a board-sanctioned proposal, the board would be creating a

SUSMP proposal that constitutes an order specifying a particular manner of compliance with a waste discharge -- with an existing waste discharge requirement. That you cannot do under Section 13360.

Simply put, this board lacks the legal authority to adopt the SUSMP proposal put forth by staff today, and we strongly recommend and urge that you honor the process set forth in the existing permit. Thank you very much.

CHAIRMAN NAHAI: Thank you very much.

Okay. The next three people I'd like to come up would be Mr. Ross Pistone, Mr. Ray Pearl and Mr. Charles Gale.

MS. GUTIERREZ: Mr. Chairman, Miss Jacobs had to leave the meeting unexpectedly this afternoon, but she has asked that I read her statement for her today, and it is being distributed to the board. She has also hand delivered this letter to yourself and to Mr. Dickerson this morning.

My name is Gretchen Gutierrez. I'm the Executive Officer for the Building Industry Association, Antelope Valley Region. The letter reads:

"Dear Mr. Dickerson, as president of the Building Industry Association of greater Los Angeles, Ventura and president of Ventura Affordable Homes, Inc., a provider of entry-level housing to our local families, I applaud your efforts to improve our quality of life by reducing water pollution.

"However, another important component of quality of life safe, affordable, decent housing may suffer as a result of some of the components of the revised SUSMP. I urge you and the board to support the Clean Water Initiative, which I have provided you a copy of with my letter of January 20th. This initiative provides a process which will achieve the board's goals by reducing pollution. At the same time, it allows for collaboration of all affected parties in a cost-effective and scientific approach.

"Using up our land, another precious resource, to reduce pollution without exploring other proven techniques merely pits one limited resource against another. We must use our limited resources efficiently to accommodate our diverse community interests.

"Our quality of life includes decent housing, job opportunities, access to education, recreation, clean air and clean water. Comprehensive and collaborative planning with everyone at the table as contained in the Clean Water Initiative is key to maintaining and improving the quality of life that California residents deserve.

"People as well as buildings are part of our environment along with our state's natural resources. All of us must work together to protect our entire environment.

R0072129

"Thank you for considering the Clean

Water Initiative which provides the opportunity to improve California's environment."

It's signed "Sincerely, Lynn L. Jacobs, President, Ventura Affordable Homes, Inc." Thank you.

CHAIRMAN NAHAI: Thank you very much.

MS. ZINKE: Chairman Nahai, I'll try not to abuse your name. I am Dee Zinke, and I'm the Executive Officer of the Building Industry Association for greater Los Angeles and Ventura Counties.

I've been asked to come here before all of you today to talk about the issue of affordability in housing. Less than one-half of Los Angeles families earning the median income can afford the median priced home today. This is 20 percent below national levels. For every $1,000 added to the price of a home, 25,000 families are priced out of home ownership in California.

At any given night here in the southland, more than 100,000 people do not have a place to sleep at night that they call "home." Fifty percent of those are children, and fifty percent of those are children under the age of five.

The regulations proposed today do not take into account any variation in housing type. Ten units of state single-family detached housing are treated the same as ten units of multi-family condominiums. It is a one-size-fits-all edict, which shows no sensitivity to the affordable end of the

R0072130

spectrum housing.

Worse, the proposed regulation hits in fill products hardest where land is scarce and expensive. The inventory of in fill land contains many contaminated sites, and there is no recognition of the environmental benefit of cleaning up these sites for the health of the watershed.

For all the interest in encouraging housing in job centers, i.e., smart growth, this ruling makes it easier for land rich, rural areas to comply but extremely difficult for urbanized areas.

There isn't a builder in this room that advocates we should be exempt from water quality measures. We are amenable and are, in fact, currently implementing long term, best management practices to improve the quality of water runoff in addition to our construction management practices.

You have several options before you today. We would urge you to move forward with the program that encourages most effective BMPs that actually serve to clean the water. If you wish to pursue a numerical standard in your new permit, use the next 18 months to develop the evidence and accepted engineering standards that demonstrate improved water quality. **R0072131**

We are your partners in achieving water quality. We are engaged and support watershed management efforts and as a result have an affinity for

regional pollutant based solutions to protect the health of the watershed, including habitats, estuaries and bays.

California is now in its eighth year of providing less than half of the homes needed to shelter California's existing population. That's 125,000 units a year we're short or up to a million at this point for existing population.

Your job is to improve and protect the water quality. My job is ensure that you fully understand the impacts of housing in that process. Shelter is considered one of the most important basic needs. Clean water is no less precious. If more children are priced out of a home because we are guaranteeing them clean water to drink, I will sleep better at night. Right now, I don't believe the proposed numerical standard will achieve that goal.

The Clean Water Initiative goes much further to addressing our water quality needs. Thank you.

Oh, and I would like to -- if I can address the question about the housing cost or the costs that were raised earlier.

R0072132

CHAIRMAN NAHAI: Well, your three minutes are up. Let's see if there's a question to that effect from anybody on the board, then we'll do that.

MS. LYON: Wasn't that Susan's question?

MS. CLOKE: Is this the percentage? Are

you prepared to answer that question?

MS. ZINKE: I wasn't prepared to answer percentage, but I was prepared to identify that they listed a per-unit cost. You can raise the cost of development, but the costs are passed on to the home buyer. And if you've got $85,000 more, then it's $85,000 more to the cost of the product.

CHAIRMAN NAHAI: It's an $85,000 unit that's --

MS. ZINKE: I'm sorry. I meant $8,500 was what was identified per unit, so it does give you an idea of what the impact would be on affordability. Thank you.

CHAIRMAN NAHAI: Thank you very much.

Mr. Pistone.

MR. PISTONE: Mr. Chairman, members of the board, my name is Ross Pistone, and I represent the Newhall Land and Farming Company. We are a large land developer headquartered in the Santa Clarita Valley.

We recognize that we have a growing population in California, and our primary objective is to provide a desirable quality of life for the citizens of the Santa Clarita Valley. We developed master plan communities that provide a balance of homes, schools, parks, retail and industrial business opportunities.

Our company is strongly supportive of the Clean Water Act. We make continuous efforts to manage our operations to assure compliance with the multitude

of existing environmental regulations.

New development projects are currently required to go through a comprehensive environmental impact report and review process prior to their approval, and there are many restrictions currently in place for those projects adjacent to environmentally sensitive areas.

Developers are also required to comply with several other complex environmental regulations governed by various agencies, including the Department of Fish and Game, Army Corps of Engineers, Air Quality Management District, the State Water Resource Control Board and local municipalities. Often these regulations conflict with one another.

As a pro-active, responsible developer, we have established an extensive erosion control program which cost, approximately, $800,000 in 1999 for the installation and maintenance of erosion control devices.

In addition, we have developed a Storm Water Management Program, which includes an ongoing SUCWRP training program for our field personnel and subcontractors. We explained the critical importance of the Storm Water Management Program, erosion control and best management practices which must be followed.

We also have an in-house SUCWRP site inspection program. A trained inspector visits each of our active projects to assure that we are complying

with our storm water pollution prevention plan and that best management practices are being applied. Citations are issued for noncompliance and immediate corrections are required.

This SUCWRP inspection program concentrates on minimizing the potential for petroleum products and other contaminants to contact the soil, and establishes a check and balance system so that contractors' activities can be monitored and additional BMPs can be employed where necessary to prevent potential pollution.

These voluntary programs are costly but have proven to be extremely effective in addressing any impact that our operations may have on clean water. We believe that new development is not a significant contributor to water pollution if erosion control devices are installed and maintained at the project site perimeter.

We believe that it is wrong for the Regional Board to target the residential, industrial and commercial development industrial by requiring numerical mitigation measures which have no proven scientific or engineering basis. We believe that these measures will directly affect our ability to provide affordable housing and employment opportunities. R0072135

We have worked side by side with the County of Los Angeles and the City of Santa Clarita during the development of the original Standard Urban

Storm Water Mitigation Plans to assure that new regulations being proposed would be reasonable, cost effective and would result in an improvement to the overall water quality.

We believe that water quality will improve through the implementation of the original SUSMPs without numerical standards that were later added by the Regional Board. We believe that being forced to implement the numerical standards being recommended by the board for residential, commercial or industrial development through the use of detention basins and other structural BMPs will create a serious long-term maintenance problem.

We are committed to supporting the Clean Water Initiative as proposed by the Building Industry Association as we strongly believe that through these efforts we will effectively reduce pollution. Thank you for your consideration.

CHAIRMAN NAHAI: Thank you, Mr. Pistone.

Mr. Pearl.

MR. PEARL: Hi. My name is Ray Pearl. I'm Deputy Director of Government Affairs for the greater Los Angeles, Ventura Building Industry Association.

R0072136

This entire process so far has been an illustration of how a public agency can attempt to implement policy based on bad science. No matter what you have been told today, the numerical standard of .75

was a negotiated number resulting from a lawsuit settlement. In fact, the L.A. County standard exists today only because NRDC sued them and forced them to implement it.

There are absolutely no studies that have been done to justify its introduction to Los Angeles County. The proposed numerical standard is not a number based on sound science. The proposal before you simply seeks to deal with an amount of water. The building industry supports a pollutant-based approach that will actually have some effect on clean water. That proposal you've heard about is the Clean Water Initiative.

We have been left frustrated and dumbfounded by your staff who have willingly taken us down this numerical mitigation path. They have put the cart before the horse by saying, "Let's solve some unnamed problem with some kind of solution, and we'll figure the rest out later." That does not make sense. It is not only bad science, it's bad policy.

How about defining the problem? What pollutants do you seek to reduce? What are the nonpoint sources that generate these pollutants? Why not develop policies that will actually reduce pollutions from these identified sources?

R0072137

No one, including your staff, has yet to cite a single study that shows this proposal will be effective in Los Angeles County. I've been calling it

"bad science." It's really no science.

We have a basic question. How will we measure if we abide by these new requirements that we have successfully achieved water quality? We asked Mr. Dickerson that very question in a meeting. His answer was, "There is no way to know." He said, in his words, quote, "We just have to do something." That statement from a public official is unbelievable and rather sad. It is no way to conduct public policy.

It does, however, illustrate one of our main concerns. This policy is a shot in the dark with no chance of achieving water quality. This policy attacks the home building industry, and if you were to believe Heal the Bay, NRDC and others, that alone will solve our water quality program.

You are addressing one minuscule, microscopic portion of the storm water runoff issue. What good is it to clean water only for new development if you have done absolutely nothing to address the millions of people already living here?

You are also under a serious misconception if you believe the environmentalist rhetoric that this proposal will keep beaches open and drinking water safe. To use NRDC's language, it is a "sellout" this time to the environmental community that will have absolutely no impact on the problem they purportedly seek to address.

R0072138

It will not clean the bay. It will not

keep beaches open, and it will not make water safe for aquatic life. As long as I've lived in Southern California I've only heard of beaches being closed because of oil spills, sewage and medical waste. Beaches are not closed because new homes are built.

There is no proof anywhere. Ask Mr. Dickerson, ask Xavier Swamikannu that this proposal will solve any of these problems. Remember, we are just supposed to do something so that we all feel good about ourselves. How about actually doing something that solves a problem?

My final question is this: Based on sound science what specific contaminants do you and your staff attribute to new housing? The answer is still unknown and unaddressed by this proposal. We support a proposal, the Clean Water Initiative, that could prove scientifically if we abide by these new requirements water quality will improve. We do not, however, support a do nothing numerical standard. Thank you.

CHAIRMAN NAHAI: Thank you very much.

Following Mr. Gale, Mr. Ramy Awad, Ms. Elaine Freeman and Mr. Tak Fujii.

R0072139

MR. GALE: Good afternoon, Mr. Chairman and board members. My name is Charles Gale. I'm the Director of Government Affairs for the Building Industry Association. I'm in charge at the regional level of regional agencies.

I stand here before you today with almost 11 years of experience in assisting contractors and home builders comply with environmental rules and regulations. I've entitled my speech here today "Other Good Public Policies." In doing so, let me begin.

I have worked with several regulatory agencies that are faced with complying with federal laws and regulations. Such agencies include the US Fish and Wildlife Service as they implement the Endangered Species Act and the South Coast Air District as they implement the Clean Air Act.

In my experiences with the US Fish and Wildlife Service, the service always begins their process by identifying an endangered species with a biological opinion, which is subject to peer review, a process. Then the service moves forward with listing the species, assessing the critical habitat, and then develops a recovery plan to ensure the endangered species will be protected and saved. Today we can credit this program with the return of the bald eagle as well as many other species.

More familiar with this agency is the South Coast Air District. The AQMD was created because the South Coast Air Basin had the worst air pollution in the nation. I think we all know that. We've heard that. For decades, the South Coast Air District has exceeded federal air quality standards. Therefore, the AQMD established an aggressive plan to clean the air in

Southern California.

The adopted rules, which I participated in with contractors and home builders, were not easy to develop, and they were not simple. But they were developed by identifying a pollutant of concern, establishing a baseline from which to work from and then locating the industry that was responsible for the pollutants. Because of the process that AQMD has gone through, L.A. no longer hosts the worst air quality in the nation.

I bring these two agencies to your attention because they are under similar -- federal mandates similar to this agency because of what they have to achieve in their environmental goals. But they always begin the process by identifying the problem, establishing a baseline and developing a process to achieve the targeted reduction of the environmental goals they're in charge of.

This fundamental process is not present in the proposal before you today. The SUSMP proposal puts the cart before the horse by offering a numeric standard as a solution before the work has been done to identify the problem.

In conclusion, I suggest the board consider the Clean Water Initiative, which is this you have in front of you signed on by 33 companies, agencies -- not agencies but trade associations that are concerned about this issue.

It calls for identifying pollutants once again, targeting the source of pollutants and then, and only then, developing a plan that will mitigate those pollutants and achieve clean water. Because it offers the simple process, the Clean Water Initiative is the best choice in front of the board.

Further, it closely follows a process called for by SCAG and the municipalities that will even bring stronger clean water sooner to our industry -- to our region. Thank you for your time.

CHAIRMAN NAHAI: Thank you, Mr. Gale.

Are we okay to continue? Does anybody need a break?

MS. CLOKE: How many more?

CHAIRMAN NAHAI: We have a lot.

MS. LYON: I think a short break is in order.

CHAIRMAN NAHAI: Okay. A short break. No more than ten minutes. We'll see you in ten minutes.

(Recess.)

CHAIRMAN NAHAI: Let's come to order, please. Take your seats, please.

Okay. The next speaker is Mr. Ramy Awad.

MR. AWAD: Good afternoon, Mr. Chair, members of the board. My name is Ramy Awad. I'm a registered civil engineer in the State of California. I do land development projects.

I am here to voice my concern regarding the lack of data about effectiveness and cost of implementing the numerical standard. I had an opportunity to review the sample calculation for using the numerical mitigation. That sample was talking about six-and-a-half million dollar project in the city of Los Angeles.

And while I agree with the method of calculating and determining the size of the required detention basin or retention basin, I don't really agree with the cost for that basin and cost for maintenance. That calculation indicates that the size of that basin would be 40 feet wide, 40 feet in length by 40 feet and width and it varies in depths between 9 and 10 feet. And when doing the cost of the land itself, accounting for a 40 foot by 40 foot, which is 1600 square feet, and came up with a dollar amount of $28,800.

While in reality, that basin is going to be 10 feet deep, and you cannot come and construct a 40 by 40 basin, which is 9 or 10 feet deep without some sort of retaining walls all around it or laying the slopes flat. And if you do so, you have to account for cost of the retaining wall or you have to account for cost of the land when you lay slopes flatter.

In my calculation, if you lay the slopes flat at the 2 to 1 ratio, which would be the minimum acceptable for safety reasons, that would increase the

cost from $28,800 to $115,200. And maybe the dollar amount is not what we're discussing here now, but all of a sudden now it's a cost that we think it's $28,000, it's $115,000. That's four times as much. And that's something we ought to look into it and consider how -- what's the effect and what's the benefit for that?

The same example also for maintenance. I locate $33 per year for maintaining that basin, and I find it very hard to imagine that a cost to clean up a basin will be $33. If you have a swimming pool, and you bring someone to maintain it for you, it's going to cost you much, much more than that. Also, if you want to hire a handyman or a laborer to come and do any kind of work on your home would cost you much more than the $33.

And my point here is we really don't have enough data to determine the effectiveness and the real cost on the home building industry or any development utilizing the numerical standard. There are other alternatives and other proposals that I urge you to look at. Listen to the engineers. Listen to the city engineers and listen to the developers. Thank you.

CHAIRMAN NAHAI: Thank you very much.

I'd like to urge as we go through this, given the fact that the hour is getting late and we have something, like, 30 cards left, if the point that you want to make has already been made by somebody else, it doesn't do any good to hammer the board

constantly with exactly the same arguments. It really doesn't. All that does is just desensitize us to what you're trying to say.

Okay. With that, the next card is from Mr. Roger Werbell, then Miss Kathy -- or Miss Katherine Butcher and Miss Dorothy Green. Any of those three people here?

MS. CLARK: Dorothy Green had to leave and she asked me to present this to you. I'm Mayor Pro Tem of the City of Rosemead, but I'm also a board member of the Los Angeles and San Gabriel River Watershed Council. And we -- so this is to be distributed to you, and I just want to say one thing --

CHAIRMAN NAHAI: Three minutes per person. Please, Miss Clark.

MS. CLARK: That wasn't three minutes.

CHAIRMAN NAHAI: No. You had your three minutes already. Remember? Those are the rules.

MS. CLARK: Okay.

CHAIRMAN NAHAI: Thank you so much.

With that, I'd like to move to Miss Jacqueline Lambrichts. Not here? Followed by Miss Heather Kuiper and Mr. Karl Brusketter it looks like. I apologize if I'm mistaken.

MS. LAMBRICHTS: Jacqueline Lambrichts with Friends of the San Gabriel River, a new nonprofit water quality focused organization supports the numeric design standard without exception as stated in the

letter in your packet.

In the process of starting a new organization in eastern Los Angeles county, it is very encouraging to find cities in the San Gabriel Valley, such as Baldwin Park, El Monte and Pasadena that are pro-active in supporting the need for a .75 inch designed numeric standard, and their letters are included in your packet.

And just a few reoccurring statements in their letters, cities continuously updating, reviewing its policies to ensure the community quality of life as well as the protection of its natural resources. They believe the overall goal of SUSMP requirements for new development and redevelopment must be to effectively reduce pollution in storm water and urban runoff and work in partnership with the Regional Board. And again those letters are in your packet. Thank you.

CHAIRMAN NAHAI: Thank you.

MS. KUIPER: Good afternoon. I'm Heather Kuiper. I'm trained as an epidemiologist, and I'm used to talking about the data on an issue, but I think that many people have done a good job of that. So instead, I'm here to speak as a community member.

I'd like to tell you about a few of the ways that I've felt the impact of the Los Angeles area's runoff problem. First, when I worked for the county health department, some coworkers and I founded an ocean swimming club. We'd meet at my home on the

coast before work, get out our wet suits, run down the beach, jump into the ocean and swim the mile back to my house where we'd get ready for work and carpool. It felt great, and at the time I felt that I loved Los Angeles, and I loved the beach.

But then I started to feel chronically sick, and, finally, I realized that I'd have to basically stop swimming in the ocean if I wanted to feel healthy. I felt angry and scared that I was so vulnerable to a public policy issue, especially when it led to the end of a wonderful activity that should be part of the fabric of a healthy community.

Another way that I've personally experienced these types of issues is in experiencing the amount of trash that's on the beach, especially after storms. On several occasions, I've gone out to pick up trash and been completely overwhelmed by the task. I also take all of my guests out to the beach, and I take them to the Ballona Lagoons to look at the wildlife there. And when I go, I want these activities to be a source of pride to prove that L.A. is not as bad as everyone thinks it is. But each outing confronts me with an overflow of trash, and I don't feel pride, and my guests leave with an unchanged opinion of Los Angeles. **R0072147**

Finally, my intention here today is to bring home to you that these standards in protecting the beaches and the broader environment also protect

people and build the foundation of an integrated society.

I am here to be -- in an attempt to represent to you the people of Los Angeles. I cannot do an adequate job because my face is only one color, my heritage is from only one continent and I only speak one language in my home. But if you go to the beaches, you will see that they are a magnet for all of the different races and cultures of Los Angeles. There's a peaceful point of convergence for the people, and we need this place to be healthy and safe and a place people can feel proud of. A safe beach and ocean is a vivid reminder that our public officials are looking out for us.

In your deliberations, please keep in mind these broader implications of your decision. I urge you to support rigorous mitigation of urban storm water without loopholes and exceptions. The community awaits your decision and thank you very much.

CHAIRMAN NAHAI: Thank you.

Next three cards I have are from Julie Barr, looks like Miss Angu Bera and Dayna Harary.

A PERSON: They're all gone.

CHAIRMAN NAHAI: They're all gone?

A PERSON: They are members of the community who've had to leave.

R0072148

CHAIRMAN NAHAI: Okay. I will note for the record that all of them wanted to speak in favor of

the staff proposal.

Were you next?

MR. BRUSKETTER: Yeah, I was next.

CHAIRMAN NAHAI: You were?

MR. BRUSKETTER: Yeah. I was the name you couldn't pronounced.

CHAIRMAN NAHAI: Oh. You're Karl?

MR. BRUSKETTER: Right.

CHAIRMAN NAHAI: My apologies.

MR. BRUSKETTER: No problem. My name is Karl Brusketter.

CHAIRMAN NAHAI: I wouldn't want you to get the impression that I'm trying to hurry anything along.

MR. BRUSKETTER: No. I'm not in a hurry anymore.

CHAIRMAN NAHAI: I'm all ears.

MR. BRUSKETTER: All right. Thank you for the opportunity to speak. I'm here speaking as a community member, and I'm also a member of Heal the Bay and NRDC, and I wanted to tell you a little about my reality.

R0072149

About early last year I had some relatives come out from Ohio, and we went down to the beach, and we're walking along the beach, and there's trash everywhere. Everywhere. About the only good thing about the trash is that we could play hopscotch and see if we could land on patches of sand, and it

wasn't very fun.

And the other thing we looked and there's signs all over saying that you're not allowed to swim in the water because it's not safe to swim in. That was the other thing that was going on.

So I looked at my relatives, and it was embarrassing to live in L.A. and see that, that we couldn't go in the water, there was trash all over the beach. It was ridiculous.

So they went home back to Ohio with their impression of L.A. and our beautiful coastline and water. And I thought, well, I know this is not an easy issue to resolve. I know it's going to take a lot of effort on the part of the community, governmental agencies, like yourself, industry, commercial, everyone; right? But I know it can be done.

And I see this piece of regulation is a huge step in the right direction. And so for you, I don't want you to get in my shoes or in the shoes of anybody else here. I want -- you can stay in your own shoes, and I want you to frame the picture. Your relatives are going to come out and you're going to go down to the beach to enjoy it, and you're either going to see trash all over the beach, and the kids won't be able to go in the water, and you're wondering what you're going to do next. R0072150

Or you can have the second picture where you go down there, the beach is beautiful, you're

enjoying the day. There's no trash on the beach. Everybody's playing in the water. There's maybe dolphins swimming by.

I hope that you look at those two pictures, and I hope that you'll make the move so that we can get the picture too. Thank you.

CHAIRMAN NAHAI: Thank you very much.

The next three cards are from Miss Shelly Magier, Mr. Bob Warnock, and I note there was Mr. Conner Everts had a card but I know he's gone. Is Miss Magier here?

A PERSON: She's gone.

CHAIRMAN NAHAI: Mr. Warnock.

A PERSON: He's gone.

CHAIRMAN NAHAI: Mr. Moore.

MR. MOORE: Somebody's here.

CHAIRMAN NAHAI: There you are.

MR. MOORE: Hello, Mr. Chairman and board members. My name is Gary Moore. I'm with the City of Los Angeles. I'm the Storm Water Program Manager.

I think you heard yesterday that our city council does indeed endorse the plan that's in front of you today. I'd like to highlight a couple specific areas of our comment letter. One has to do with the waiver.

R0072151

As the board and the executive officer has entrusted the cities to deal with many or almost all the issues in the permit, we respectfully request

that jurisdiction to determine when a waiver is necessary would be granted to the cities. We believe that this would expedite the process and not add burden to contact the Regional Board on this issue. So -- and we also propose that we would annually with our reports submit any waivers that we had granted during that year so that everybody would know what we're doing.

The next area has to do with -- we talked a lot about the vehicles and that they seem to be causing a lot of the pollution here, and most of everything we're doing here is treatment or retention. The USEPA and the State of California has successfully worked with engine and car manufacturers to reduce vehicle air emissions. There may be opportunities to minimize vehicle equipment leaks through vehicle modifications.

We're proposing, since vehicles are called in on a regular basis for emission test, if it would not be possible to educate the vehicle operators as to the impacts of such leaks that would result in the minimal cost to the state program while potentially resulting in potential benefits to the water quality.

Another area that we addressed in our letter to you is in data gathering. We recommend that the Regional Board establish a regional ambient water quality monitoring program. What we're saying here is that similar to the air quality network, we would start sampling a base -- to establish a baseline, and during

the next year and a half while we're preparing to negotiate the new permit, we would begin to gather data. We believe that this would really help the public to gain support if indeed we go further with this program than is proposed here today.

That concludes my comments and the City of Los Angeles appreciates all your efforts. Thank you very much.

CHAIRMAN NAHAI: Thank you very much, Mr. Moore.

MS. CLOKE: Mr. Nahai, I have a question but can I have a copy of his comments?

CHAIRMAN NAHAI: Do you have an additional copy of your comments?

MR. MOORE: Those comments that I just expressed are in the letter that we distributed. Yes.

MS. CLOKE: Oh. Okay. I have that. Thank you.

CHAIRMAN NAHAI: Thank you.

The next three cards I have are from Mr. Michael Huls, Mr. Dan Grissete, and Miss Marsha Hanscom. Are any of those people here?

A PERSON: Mr. Huls has left, Mr. Chairman.

R0072153

MS. HANSCOM: Good afternoon, honorable board and staff. My name is Marsha Hanscom. I'm Executive Director of the Wetlands Action Network and Vice Chair of the Conservation Committer for the Sierra

Club, Los Angeles Chapter, which has more than 50,000 members here in this region.

We strongly agree with the staff's proposal to include the .75 inch numerical standard and, in fact, think that is absolutely a baseline. I don't think any of the environmental groups that were here today suggested that this would totally clean up our beaches and totally improve everything. We're just saying that we need to stop of the hemorrhaging, and this is the minimum acceptable.

We also strongly oppose the exceptions and exemptions that have been added since the fall, and I'd like to just suggest that -- you know, I understand your charter to be that you're not to balance the environmental municipality and business interests but rather to ensure optimum water quality in our region, in our creeks, our rivers, our wetlands, our aquifers and the bay.

And so in light of that, I hope you'll agree with me that we cannot continue to practice business as usual and expect better results in terms of our water quality.

Federal policy under the Clean Water Act, not the Clean Water Initiative, the Clean Water Act, which you have the authority to carry out as our state water regulatory body includes new guidance under the Clean Water Action Plan which says this nation has a goal to recover 100,000 acres of wetlands each year.

Now, this storm water mitigation plan can help us reach this goal. 98 percent of our we lands are gone in this area, and that's part of the problem, part of why we have so much pollution.

Let's remember what's underneath all this pavement. La Cienega, the swamp, La Ballona Estuary created by the confluence of L.A. River, Ballona Creek, Walnut Creek and Centinela Creek. If we reconnect the water with the land, this will help us minimize flood damage and remove pollutants in our waterways.

Board Member Diamond, you asked a very good question earlier about the rooftop exemption related to increasing impervious surface. This ill-founded exemption will only encourage the trend of decreasing water that is soaking into our soil. The idea is not to eliminate rainfall by catching it off the roof and sending it quickly to the bay but to allow rain water to be part of the ecological cycle that nature intended.

The gas station and parking lot exemptions are also just ridiculous. All of these new and redeveloped facilities need to be in compliance.

And I'd like to ask you to think about another vision for our parking lots and consider that in between the rows of parked cars there might be prairie needle grass and California poppies. Two species that are native and actually thrive on human trampling, but they've been decimated by years of

cattle grazing, paving, and those kinds of things are easy and inexpensive to implement.

We could have color, and we could have song back in our areas. This would attract songbirds. This would attract a lot of the species that we need to have a healthy ecosystem.

So in sum, we need your leadership to help restore our natural beauty and the quality of life in Los Angeles. And so I ask you to please approve the numerical standards, remove the exemptions that would effectively gut that, and as to the proposal submitted that all residential development be excluded, I'll just leave you with the words of Henry David Thoreau who said "What is the use of a house," even an affordable house perhaps, "if you haven't got a tolerable planet to put it on." Thank you.

CHAIRMAN NAHAI: The next card I have is great. It has no name on it. But under "representing," it says "myself and my son." So if there's a person here representing yourself and your son, there you go. Good for you. I like to represent my son wherever I go too.

MR. POPE: Thank you very much. My name is Bill Pope. And, actually, it'll be more accurate to say that I'm here -- Bill Pope, P-o-p-e -- to represent my grandchildren because it's actually too late for myself and my son.

CHAIRMAN NAHAI: I'll add that to the

card.

MR. POPE: Please.

I say it's too late for me because I started skin diving when I was in my middle teens, and I've had the displeasure of seeing the demise of our coastal area over the last 40 years from areas that had giant kelp forests and spectacular sea ferns to areas that for all practical purposes today are biologically dead.

You know, as a kid maybe you had too, some of you that are my age had the privilege of standing on the Santa Monica Pier watching the whales go by rather than having to charter a boat to go out 20 miles to sea. They don't come in too close today. I'd like for my grand kids to have that opportunity again.

But that's kind of a platitude. Let me tell you about a specific problem. My son, 26 years old, very talented musician, sound engineer, plays six instruments, composes, produces his own music, just released his first CDs as the Spinning Top and Orange. I promised I'd say those words. He -- his second CD is very inspirational music based on his experiences of life growing up around and in Santa Monica Bay. That's the good news. He's about to become financially independent.

The bad news is that he's losing his hearing from repeated ear infections that at least two

of the seven doctors, after two operations that he's been through, say that feel strongly enough that it's linked to his experiences in Santa Monica Bay because they can trace back to when it happened and what he was doing, that they told him to stay out of the bay. He's no longer -- not only has he lost his ability to enjoy the ocean, he may be losing his ability to produce income.

I came here to thank you for doing something, as some people say. My God. We haven't done something for 50 years. It's nice that we do something. Maybe we can turn the tide, but I am dismayed about all the different exemptions that I'm hearing about today that seem to be filtering in.

If we exempt rooftops and say you don't have to consider that in calculating the size of whatever you do to filter out the pollutants, you've exempted, you know, 50 to 80 percent of the land area. The result is going to end up being that the water is going to wash across the lawn and into the ocean -- again into the street and carry the pollutants to the ocean.

It's common practice to channel water away from your homes. In my neighborhood, everybody that I know of has built underground pipes to take the roof water out of the gutters and take it straight to the stream. I'm guilty of that myself. After hearing about this stuff, I'm going to go home and drill holes

in those pipes so it'll filter out.

But if we -- if you also exempt compacted soil, you end up doing the same thing. The water is going to -- even though it drops on area that's not polluted, it's going to run off, go in the street and wash more pollutants out there.

If we exempt areas -- restaurants, that are 5,000 square feet or less, according to the statistics presented by their representatives today, that's going to exempt all of them, all the new fast-food restaurants because they're all smaller than that.

So I want to urge you to implement this proposal as planned without exemptions and start doing that something that we should have done 50 years ago. Thank you very much.

CHAIRMAN NAHAI: Thank you, Mr. Pope.

The next three cards I have are from Mr. Ray Tahir, Mr. Ross Clark and Mr. Steven Braband.

MR. TAHIR: Mr. Chairman, board members, staff, good afternoon. Once again it's a pleasure being before you. My city fully supports the need for numeric design standard but only as a sizing formula for treatment BMPs. It would be silly not to have one, but it would also be silly to have a design standard act as a determinant for numeric -- for treatment retention controls for all the seven categories of SUSMPs revision that staff is recommending.

Also we're very much in support of SUSMPs, but they're opposed to the addition of two new SUSMP categories. This is because they're not included in the L.A. County permit.

My cities favor the prescription of retention treatment BMPs as long as they are allowed the discretion to determine when they should be prescribed. That is what the permit intended, and that is what other NPDES permits in California require including neighboring Ventura County, including neighboring Orange County.

What my cities are opposed to are mandatory retention treatment BMPs such as catch basin inserts and detention basins. Why? Well, for one the revised SUSMP allows developers to select any retention treatment control on that BMP list that includes structural treatment controls, as long as the developer meets the numeric design standard requirement. It matters not if the control is ineffective.

For example, the developer could comply with the retention treatment requirement by selecting catch basin inserts which are very cheap, about $800 a unit. The problem, as indicated in a recent study conducted by Woodward Klein for cities of Northern California, Alameda County in particular, is that these devices don't work well. The mesh filters that they use clog up easily. Some of them fail or lose significant chemical removal efficiency after each

storm event. As a result, Northern California cities disfavor their use. This was also why Ventura County discourages them.

In consideration of the foregoing, it is recommended that the board direct staff to approve the revised SUSMP excluding the mandatory retention treatment controls. Further, I'd like to point out to you that it appears that the Regional Board staff has not fully evaluated SEQWA in the light of these SUSMPs. I don't think the significant impacts of those requirements that are contained in staff's report has been fully evaluated and they need to be quite obviously.

On a more cheerful note, I'd like to congratulate you on your 50th anniversary, and I look forward to seeing you this evening under more festive circumstances.

MS. LYON: Ray, before you leave.

MR. TAHIR: Yes, ma'am.

MS. LYON: First part of your testimony, I was a little unclear about the cities you represent and their stance on the numeric standards.

MR. TAHIR: Okay. There are all kinds of interpretations of what numeric standards mean. Okay. Initially the numeric standards were used as determinant for requiring all subject new developments to install mandatory retention controls. Okay. That's been changed now. Now they're not talking about

numeric standard in that light but rather as a design standard. Okay. And we have no problem with that.

We need to know what size to design these structural controls in order for them to work properly. Okay. But we do not want them to act as a determinant for each of those new developments to mandatorily impose retention treatment controls because they're so extreme and very costly.

MS. LYON: What cities do you represent?

MR. TAHIR: Well, some of them are out here: Cerritos, Lakewood, Whittier, Lomita, Azusa, Duarte and a cast of others. I can't remember them all. Thank you

CHAIRMAN NAHAI: Mr. Clark.

MR. CLARK: Good morning. Or I'll change that now. My name is Ross Clark, and I'm with the California Coastal Commission Water Quality Unit.

On January 20th, our Deputy Director Jamie Kooser wrote the Regional Board a letter in support of the Standard Urban Storm Water Mitigation Plan. Today I wish to voice the commission staff's support of both the proposed Standard Urban Storm Water Mitigation Plan and the region-wide numeric design standards for post construction BMPs.

The proposed plan is a progressive step towards protecting and restoring the region's water quality and protecting coastal resources, including the use of natural habitat, public access and recreation.

Integration of BMPs into new development is a critical next step in limiting urban nonpoint source pollution. Developing standard guidance for the entire region will also help to promote watershed-wide protection for nonpoint source degradation.

Integration of post-development BMPs as proposed by this plan is consistent with the statewide NPDES pollution control plan recently adopted by the State Water Resources Control Board and the Coastal Commission. The further protection of environmentally sensitive areas corresponds with Coastal Commission's goal of protecting critical areas -- critical coastal areas of all types, including quality of water associated with wetlands, estuaries, public beaches and offshore coastal habitats.

We hope that today's action will facilitate the use of effective and appropriated BMPs that improve water quality while allowing for future development. The Coastal Commission is committed to working with the Coastal, Regional Boards and the State Water Resources Control Board within this 15-year strategy to improve the tracking of a new BMP implementation and the assessment of their success.

We feel that only through the continued assessment of BMP effectiveness and providing up-to-date technical assistance can the public be confident that BMPs are worthwhile. As of today, it looks like the public and the NRDC have provided, I think, the

most up to date and BMP effectiveness assessment that we've heard. Thank you very much.

CHAIRMAN NAHAI: Thank you, Mr. Clark.

Are you Mr. Braband?

MR. CLARK: I was Mr. Clark.

CHAIRMAN NAHAI: Oh. You were Mr. Clark. Of course you were. You still are. I hope you will continue to be for a long time.

After Mr. Braband, we have Mr. Royall Brown, Mr. Maurey Frohman and Mr. Scott Stone.

Go ahead, please.

MR. BRABAND: Good afternoon, board members. My name is Steven Braband, Biosolutions, Incorporated. I was on the Malibu Creek Watershed Facilitation Group representing the City of Malibu Waste Water Study Group for four years. I am board -- on the board of directors at the California Onsite Waste Water Association.

A division of our company handles operation and maintenance of decentralized waste water systems of commercial properties. The majority of them are in Malibu, but they range from San Louis Obispo down to San Diego County.

R0072164

The reason I come here today is that in many cases I've -- just recently I've been approached by my clients and my -- some of the vendors about operation and maintenance of some of these storm water systems. I'm here today not to see if but how our

maintenance operations are going to proceed.

First of all, I'd like to say that I support the direction that your board is going and the direction that your executive director has made recommendations for, and I fully support that. I do have some -- a few comments and clarifications of things that came up today that I'd like to address.

One of those is the accountability of maintenance. If you're going to actually enact this, I think one of your board members was going to say how are you going to ensure that once they're installed they are going to be maintained and how that's going to work. So that's a very important aspect that you have to take into account.

Another thing is consistent ordinances by city. You're going to mandate the cities to process orders, but what tends to happen at that time is they start getting different and an engineer has to figure out what city he's doing it for, what problems are going to be encountered. So if we could have consistency there, I think that -- I think we would go a long way also.

Because I deal with maintenance of about 70 percent of the restaurants in Malibu, I'd like to say that as far as restaurants are concerned, some of those small fast-food restaurants actually produce more waste than larger restaurants, and if you think of the concentration with the drive-thrus of exhaust on the

runoff, that's an issue that we should really address too.

Grocery stores with delis, I think that was brought up earlier. That we have had problems with because you don't really think that that's a problem, but the grease created and the maintenance of that for storm water becomes an issue.

Okay. Fecal contamination by pigeons and seagulls on rooftops is something that wasn't addressed, but I have had to do it, and I see I'm out of time, so thank you very much.

MS. LYON: Could you tell me the business you're in again, please.

MR. BRABAND: We have an operations in maintenance of onsite wastewater systems or decentralized wastewater control systems. Many -- well, it's not many but more and more in the rural areas wastewater systems are being treated onsite. We have --

MS. LYON: Okay. That's fine. Thank you.

MR. BRABAND: Yeah. Okay. All right.

CHAIRMAN NAHAI: Thank you.

R0072166

Mr. Brown.

MR. BROWN: Royall Brown, a resident of San Gabriel Valley. I'm a retired registered engineer in the State of California. Started my career in water quality in the State of California Department of Water

Resources. The last position I held was as an elected board member for the San Gabriel Valley on the Municipal Water District. So I've had over 40 years of experience in water quality and water quality problems in the State of California.

Yesterday we had a small urban runoff storm. The neighborhood I live in in San Gabriel Valley, I'll tell you, not one drop of that water ever reached the ocean. Why? Because we already have installed in the San Gabriel Valley multiple catch basins known as spreading grounds and diversion dams, rubber dams that already catch the water and divert it. So our receiving waters for our urban storms, some 90 percent by calculation, according to the county, of our storm water already goes to our receiving body, which is the groundwater basin in San Gabriel Valley and Central Basin in the southern portion of the county.

To make a developer -- like, I live in a canyon, a branch of Walnut Creek. I've lived there for 26 years. There's a big vacant lot that a developer has said that can have about 55 town homes on it. It would be redundant to have him put a catch basin in on a property when the public, through taxes, have already put in a catch basin downstream.

I think your regulation needs to recognize where there is already public facilities to catch this water and keep it from going to the ocean.

R0072167

You heard a lot today about beach pollution, pollution along the coast. That's a problem in itself. But if you already catch 90 percent of the urban runoff in San Gabriel Valley, San Gabriel Valley isn't really contributing to that.

And your rule about three-quarters of an inch wouldn't stop the big storms anyway. It's the big storms, once or twice a year. We have a big storm in San Gabriel Valley where any water is allowed to go to the ocean. That's not the regular storm that causes the beach pollution because on that big storm there is a horrendous amount of water going down everywhere.

We also in the processing, mother nature has provided us conveniently processing in our spreading grounds that clean up oil spills, the bacteria and the viruses that are naturally there because this area I live in, there is underlaying by oil. The oil is seeping up all the time. Otherwise, we'd have standing oil in the community if we didn't have the viruses and bacteria that clean up our spreading grounds.

So I ask you to change this permit. Make it a bifurcation by watersheds, and I understand that SCAG has suggested that to you, and I would support this type of provision only if it's amended to make it realistic to those who have already spent millions upon millions of dollars to correct this urban runoff problem. Thank you.

CHAIRMAN NAHAI: Thank you, Mr. Brown.

The next three cards are for Mr. Maurey Frohman, Mr. Scott Stone and Miss Leslie Mintz.

Mr. Frohman.

A PERSON: He's no longer here.

CHAIRMAN NAHAI: Mr. Stone.

A PERSON: I think he's in the foyer.

CHAIRMAN NAHAI: Well, Mr. Stone?

MR. STONE: Did I hear my name?

CHAIRMAN NAHAI: Are you Scott Stone?

A PERSON: No.

CHAIRMAN NAHAI: Is there a Scott Stone anywhere?

A PERSON: He's left.

CHAIRMAN NAHAI: Okay. All right. Ms. Mintz, Leslie Mintz.

MS. MINTZ: Leslie Mintz here for the public. I see and I am awakened. I hear and I am moved. I do and I understand. It's a Chinese proverb about how to learn. The permittees, the cities, can do what this standard proposes.

For months, the Regional Board has been through a detailed due process, been trying to do something. Three-and-a-half years of process, multiple opportunities for comments, versions, workshops, hearings. The provisions of the permit have been satisfied. Moreover, once the deadline six months ago, occurred the permit requirement kicked over into

adoption. The due process requirements are over.

On behalf of my environmental brethren who were here by the bus load earlier, I would ask you to please approve these standards without arbitrary exceptions that cause confusion and I think create more work for Regional Board staff and, as the EPA requested, without delay. Thank you.

CHAIRMAN NAHAI: Thank you very much.

The next card is from Mr. Charles Redden, Mr. Robert Wright and Ms. Heather Leamarinda.

MR. REDDEN: Good afternoon. My name is Charlie Redden. I'm a senior management analyst for the City of Covina. I will be responsible for implementing this plan in my city, and I don't feel that -- and I feel as it stands now that it can't be done.

What is the plan? I'm not sure. And by the board's confusion earlier this morning, I think you understand my questions. I have two different plans dated on December 7th and haven't even seen the plan dated January 21st. I received change pages two days ago to a plan that didn't match any plan that I have. What kind of review is possible under these conditions?

I have some questions and some answers have already come forth. But somebody who just gets the plan and has to implement it doesn't know because he wasn't at this meeting. Does a 5,000 square foot restaurant mean floor space, include the parking lot or

lot lines? What is the commercial stand alone parking lot? What does that mean?

By the SUSMP, an automotive repair shop includes SIC 5013. This is wholesale distribution, motor vehicles supplies and new parts. And as SIC 5014 that's wholesale distribution of tires and tubes. What is the storm water problem with these facilities?

And do I have to ask the AM PM who wants to come into my city to provide their profit and loss statement so I can determine if they are going to be a gas station or a restaurant or something else?

There's not been enough time and thought on this SUSMP. I urge you to follow the agreed-upon procedures and process that we had in the permit and do it right so the plan can be implemented. Thank you.

CHAIRMAN NAHAI: Thank you very much.

Mr. Wright.

And finally Miss Leamarinda.

MS. LEAMARINDA: Is it evening yet?

CHAIRMAN NAHAI: It's getting there.

MS. LEAMARINDA: Good afternoon. Thank you for letting me be last. I'm in a unique position. I work for the City of Calabasas. I'm the Storm Water Program Manager there. I think we have one of the most comprehensive storm water programs in the county.

But I also have the benefit of working with a lot of other cities, and I think what's evident here is that we're living and we're trying to implement

these programs in a culture of distrust. Nobody trusts each other here. It's sad and it's frustrating because what really needs to happen is that we all need to work together to find the water quality solutions. That's the only way that our beneficial uses are going to be restored. Ever. Period.

Storm water -- the problem with storm water is really well understood at the beach. We all know there's a problem. But it's not well understood at the source. Everyone's looking for a cannon, and it's a really a thousand BB guns with really the same equivalent impact as a cannon. And that's why if it was easy, it'd already be done. It's not easy. It takes a lot of time, a lot of effort and a big commitment from a lot of people.

That's why I'm proposing that we look at this as something where we're going to look at an accelerated TMDL process to implement this. Rather than just a volumetric approach.

I think it'll be more effective when we do the TMDLs we can implement best management practices that are associated with that TMDL for pollutant removal capability with the understanding of beneficial use. And then it's not a blank check. There is a final piece.

R0072172

We know that there's a problem in the water. These are -- these reaches of whatever river, you know, if it's Malibu Creek, if it's L.A. River, if

it's San Gabriel River, we know that there's a beneficial use impairment. We know pretty much what the chemical -- the big chemicals are at least for the next few years, so why not embrace that process, which is already a stakeholder process, that will deal with the pollutants of concern and will allow cities to priorities. Without it the water will not get clean.

We're assuming that all the pollutants -- for example, a lot of these -- the BMPs that are listed in the SUSMP right now have nothing to did with bacteria. Nothing. There's no disinfection. There's no -- that's what I'm listening for. I can guarantee you the bacteria isn't going to get solved with the SUSMP.

Without inclusion of the TMDL, we're going to have a schizophrenic program where we have the TMDL process over here that we have to do with this three-quarter inch limit over here and trying to figure out how we're going to get these things to merge later on is not going to work. We want to restore the beneficial uses. That's the goal. That's what's in the basin plan. That's where we should be heading. Not just figuring out what in piecemeal the way of kind of maybe we'll get there some day. **R0072173**

In my lifetime, in 25 years from now, I want the beneficial uses restored in this water. It's not going to happen with just a three-quarter inch limit and to assume that we're going to be affecting

development policies for the next, you know, 50 years and it's going to end up with water quality is a farce. It's not going to happen.

We all need to work together to find an answer to clean water solutions in our lifetime and stop worrying about being the side that's right. Thank you.

CHAIRMAN NAHAI: Thank you very much.

All right. That concludes the public cards that we have.

Did I hear a plaintive voice from the back of the room? What's your name?

MR. WRIGHT: Robert Wright.

CHAIRMAN NAHAI: Oh. I called you.

MR. WRIGHT: Well, you said my name was Stone or something. I haven't been stoned in such a long time I don't remember what it was like.

CHAIRMAN NAHAI: I called Robert Wright and you have a nickname which is Rusty.

MR. WRIGHT: I don't know why.

CHAIRMAN NAHAI: Because the card I have for you said "Robert Rusty Wright."

MR. WRIGHT: Yeah. Do you want me to give what I got here? The roof area.

CHAIRMAN NAHAI: Go ahead. Three minutes. R0072174

MR. WRIGHT: There you go. Some attorney wanted me to get this in the record. It applies only

to roof runoff with essentially no pollutants. It has the dust and fall out that would have fallen on the natural flora and fauna anyways.

But then when we did some numbers with -- I did some numbers Mr. Bill Pope. Yet on an average 3,000 square foot house, if you get an inch of rain, you get 1440 gallons off the roof, and we were trying to figure out whether you should have a leach line up on that, but then you have to do a diverter thing.

They just -- in front of my folks' house, they just put in one of the bay -- one of the 62 in the Santa Monica Bay. There are 62 outfall pipes, and they just put in one of the low flow diverters, so I get to look through that, and they're waiting for the electronics to come in on when the valve pops in and stuff. So I know a little bit about it.

And the other thing I wrote was: Why don't you just get job done and hire some people who know what they're doing, who know the construction business, who know economics and bring them together and get something that will actually do the job? Did I make my point?

R0072175

CHAIRMAN NAHAI: Thank you.

MR. WRIGHT: Thank you very much.

CHAIRMAN NAHAI: If there is anybody in the audience who feels that they have a new point that hasn't yet been expressed, I'll allow you a minute at the podium. A new point that hasn't yet been

expressed. If you said that you feel there isn't enough data -- okay.

MS. CLOKE: You have 22 seconds.

MR. YOUNG: Oh. I believe this is a new point, and it's the question of the definition of commercial, which was banded around -- by the way, for the court reporter I'm Rufus C. Young, Jr.

Might I suggest that the definition of "commercial" as applied to land use comes from the zoning ordinances of each of the respective permittees. Thank you.

CHAIRMAN NAHAI: Thank you very much.

Any other new points? Great. Thank you.

Well, that concludes, then, the testimony from the public.

Do we have a staff response? How much time, Dennis?

MR. DICKERSON: Very quick.

MS. CLOKE: Three minutes.

MR. DICKERSON: Very quick. I'll try to do this in three. TMDLs --

CHAIRMAN NAHAI: Time him, Ronji. And I don't want you to worry about the fact that you work for him.

R0072176

MR. DICKERSON: All right. TMDLs implementation plans, it's a key part, and this is an extremely important part of implementation plans. TMDLs will never work if you don't take a strong stance

on SUSMPs.

The .75 inch issue has been on the table since last August. Many, many discussions, many changes, true. But in almost every case those changes have been favorable to the people who have been complaining about the SUSMPs with respect to most of the cities. We've been trying to respond to their concerns over and over, and yet it's still not enough.

I do believe that we need a factual basis to include rooftop water within the exemption -- within the SUSMP. There simply is not, in my opinion, enough hard data to include that.

More studies, everyone wants more studies. Sure. Give us more money. Give us more time, and in all honesty, give us a lot of money and a lots of time. Otherwise, it's never going to happen.

One argument is that we cannot adopt any SUSMP requirement given the prohibition in the statute. If that were true, we could never adopt any SUSMP under any provision. That would simply be totally impossible. And Jorge I think has comments on that as well.

R0072177

The staff issue, I do hope you'll recognize that everything that we've done is on the basis of one individual working full-time, already overburdened, already spending -- diverting resources away from things that we should be doing just to focus on this issue. We truly need more staff. I'm looking

for -- yes. More staff, more money in order to get this job done. Thank you.

And finally the quotation that we need to do something. Well, yes, of course, we do need to do something. That's our job. And the idea is to do something about cleaning the water, and that's what we've been trying to do. Oh, I still have green. I think I'll let it go there and save time.

CHAIRMAN NAHAI: That doesn't mean that you've got to keep talking. I had some questions to ask you though. Do any of the board members have any questions for Mr. Dickerson?

MS. CLOKE: You go first, David. You'll probably ask all of our questions.

CHAIRMAN NAHAI: Not necessarily. I'm sure not.

I wanted to just get your reaction to a few points that were made which caught my attention. The first is that I think it was Dee Zinke who made the point that when you're talking about a subdivision of ten homes and over that that catches ten condominiums, and whereas if development of ten condominiums in terms of the amount of impervious surface that it creates, may be really no more than two-single family residences put together. How do you react to that?

MR. DICKERSON: The original -- everything that we're doing is on the basis of the original permit in 1996. I was not part of that

R0072178

discussion. And there's no split definition for condos.

Xavier, do you have any help on that?

MR. SWAMIKANNU: In 1996, we identified these seven categories, and they were generally large projects with certain specific commercial facilities, but we didn't go beyond that. We didn't contemplate apartment buildings at that time or condos at that time. So --

CHAIRMAN NAHAI: Xavier, is the only reason why condos become important is because they're subdivisions whereas apartments are not? So while apartments may be caught under the general definition of a commercial development, a ten-unit condominium subdivision may not be. Do we have any history of how that's been dealt with in the past?

MS. CLOKE: I think I could answer that question very quickly. Condominiums need subdivision maps and discretionary action.

CHAIRMAN NAHAI: That's not my point.

MS. CLOKE: I'm sorry.

MR. SWAMIKANNU: No, there's no history of that discussion.

CHAIRMAN NAHAI: The next question that I wanted to put to you is I think that Mr. Piasky who maintained that the definition of "environmentally sensitive areas" as we -- in the proposal is way too wide and that by the three categories that are put in

R0072179

there that one would not be able to identify what environmentally sensitive areas are. Can you give me your response to that?

MR. SWAMIKANNU: Mr. Chair and members of the board, my response to that is I think what Mr. Piasky is saying that he's familiar with the categorization from the county's point of view, but he's not familiar with the other two categories, the one by the State Water Resources Control Board. It is a special biological significance. And the other one from the California Resource Agencies. We have provided some reference document in the definition to go back to. And this --

CHAIRMAN NAHAI: My question is this: Those areas are readily ascertainable by reference to those reference --

MR. SWAMIKANNU: Yes.

CHAIRMAN NAHAI: -- materials?

MR. SWAMIKANNU: Yes.

CHAIRMAN NAHAI: The next thing that I wanted your reaction to was I think Mr. Braband who pointed out that we have many fast-food operations which are under 5,000 square feet and which may yet generate pollution that is out of proportion to their size. Do you have any reaction on that viewpoint?

MR. DICKERSON: We're very open to taking board direction on what would be an appropriate number in that respect.

CHAIRMAN NAHAI: And finally in connection with --

MR. SWAMIKANNU: Mr. Chair, may I add to Dennis's comment?

CHAIRMAN NAHAI: Of course.

MR. SWAMIKANNU: The 5,000 square feet threshold comes from looking at other programs around the country, and there's general policy towards prohibiting some kind of small business exemption. That's certainly under consideration.

CHAIRMAN NAHAI: And Mr. Brown pointed out that there are some areas which have on a community-wide basis, you know, what should I call them? Communal catch basins or -- is that a commonplace thing or --

MR. DICKERSON: I'm calling for some help from our engineer of residence.

MR. DASKER: Dennis Dasker of the Regional Board staff. Along the foothills, the Los Angeles County Flood Control District has placed a lot of catch basins, and they are, you know, covering certain areas. There are areas also which the local cities and other districts have put up catch basins. So there are catch basins, yes, which cover areas that are protecting areas which may be developed in the future.

R0072181

So -- but in cases like that, you have the quantity question. Wherever you put a footprint on

the ground, on some natural ground, you're going to develop a little higher flow. So every development is inching up a little higher, and you may overwhelm the community catch basin that's been put in already.

So it's something that would have to be considered when you look at the developments.

CHAIRMAN NAHAI: So it would be your position that these SUSMPs would nevertheless be necessary even in those communities?

MR. DASKER: It's something that would have to be looked at depending if it's a heavily developed area where there's very little new development coming in, it may not be critical. Other areas, it may be critical, yes.

MR. DICKERSON: It actually is a very interesting point that bears some looking into because it could be looked at as a regional SUSMP, if you will.

CHAIRMAN NAHAI: Okay. All right. Those are my questions to you. I have a number of suggestions with respect to the language of the permit as we have it later on.

But are there any other questions for Mr. Dickerson?

R0072182

MS. LYON: Only that I'm concerned with regard to cities that do have hillsides, what we're going to do in that respect. I know in particular -- I sit in the municipal category, and I'm in the city of Rancho Palos Verdes. We cannot let water percolate

down into our ground because of the geologic conditions there that will cause landslides, and I believe Diamond Bar has some similar issues. What are we going to do about that type of issue?

MR. DICKERSON: Well, with respect to hillsides -- correct me if I'm wrong -- we did adopt the language that was for a definition of hillsides that was recommended by the county and by the EAC, the Executive Advisory Committee, so hopefully we've been responsive to those, and we also have a waiver provision.

MS. LYON: Well, I'm afraid in a city like ours, it'd probably be a waiver of everything. There are so many hillsides. So I'm just curious how we're going to handle that.

MR. SWAMIKANNU: I -- I'm -- the purpose of the waiver provision is basically when you're in a situation that all BMPs don't work, infiltration is just one kind of BMP. Others might be considered. And if others are infeasible as well, then we have the end provision whereby you can contribute to a project that addresses storm water within the city.

MS. LYON: So we would be asking anybody who wanted to remodel or build in our city to contribute to some other project?

R0072183

MR. SWAMIKANNU: If you belong to these categories, home subdivision, businesses, basically these specific categories, not all development.

MS. LYON: Okay. I have another question to ask with regard to the Porter-Cologne Act. Is there anything in that Porter-Cologne Act that says that we must take a look at anything economic? I believe there is.

MR. LEON: Yes, there are provisions, Miss Lyon, in all of the proceedings, including planning. This is not a basin planning, but the staff did look at some of the economic issues, and they've been identified for the record.

MS. LYON: In the staff report, you did bring up one thing. You suggested that cities might be able to pass the cost on by a utility fee. Cities can't just arbitrarily do that any longer. That has to be by a vote of the people now, so I wasn't aware if our staff was aware of that. This is going to be a horrendous cost to cities, and I don't know how they're going to handle that.

MR. DICKERSON: I think that was put in the staff report just as a point of information.

CHAIRMAN NAHAI: As a board, are we able to encourage adoption and yet give direction to you to come back to the board with additional, you know, responses to specific questions which could then amend the plan in the future?

R0072184

MR. DICKERSON: You could certainly adopt -- as I laid out the -- you have a whole choice of options today, and really you can -- you can select

any of those in any degree. You can adopt something which then we can work on additional refinement and bring that back in the future. Certainly. So you really have just a whole range of choices that we outlined earlier.

CHAIRMAN NAHAI: Do you have a more -- a clearer definition of what constitutes a commercial development for us to consider?

MR. DICKERSON: I believe they were working on that earlier. Yes. It's right here.

MR. SWAMIKANNU: I hope -- I want to discuss commercial in the context of the storm water program -- the Federal Storm Water Program, and clearly the division there is between industrial, commercial and residential. The industrial component is covered by the statewide storm water funding under federal law, and the rest of it is covered through the municipal program, that is, commercial and residential.

So the definition I worked on is -- and can be modified but uses that concept and also takes on -- reviewed the category that L.A. County requires conditions for and identified many of those as being commercial.

So the definition means -- commercial means any development on private land that is not residential or industrial. The category includes but is not limited to hospitals, laboratories, other medical facilities, educational institutions,

R0072185

recreation facilities, multi-apartment buildings, nurseries, mini-marts, shopping malls and other business complexes. I tried to be inclusive.

CHAIRMAN NAHAI: Office buildings?

MR. SWAMIKANNU: It's not -- we could add that. I could add that.

CHAIRMAN NAHAI: Hotels? I'm asking you.

MR. SWAMIKANNU: Yeah. They are commercial. They are commercial.

MS. DIAMOND: Is there anything that is not included that's not residential? Schools?

MR. SWAMIKANNU: Agriculture, for example.

MS. DIAMOND: What about schools? Is that?

MR. SWAMIKANNU: Schools are educational institutions. I tried to put that down.

CHAIRMAN NAHAI: Oh.

MS. CLOKE: So where do buildings like public storage and warehouses, buildings that have really large roofing areas, but I don't know how -- are they also included in this category?

MR. SWAMIKANNU: The difficulty there is that public warehouses are associated with transportation and identified as industrial under the federal scheme of things.

R0072186

MS. CLOKE: But they site them in C zones in cities. Public storage facilities are in C zones as

well as in M zones. I mean --

MR. SWAMIKANNU: I'll include that.

MS. LYON: And these type of commercial businesses are already practicing best management practices; is that correct, under the basic permit?

MR. SWAMIKANNU: The industrial ones are, not the commercial ones. The whole purpose of --

MS. LYON: Well, those that lie within the cities that are permittees, we require them to do their sweeping and all that menu that you mentioned earlier.

MR. SWAMIKANNU: Yeah. We require municipalities make sure that these things happen, different soils controls.

CHAIRMAN NAHAI: And --

MS. LYON: And that's being done now?

MR. SWAMIKANNU: Yeah.

MS. LYON: Do we have feedback on how that is helping?

MR. SWAMIKANNU: I think source control, anything that's not exposed is not swept away doesn't get into the storm water. And many of the early programs we tried to integrate the existing municipal functions, and so clearly trash removal has a benefit, and there's been some effort to quantify that.

R0072187

And recently the county put together an annual report and some of that is summarized there, but we didn't really structure it towards exhaustively

quantifying the benefit, but clearly there are case examples.

MS. CLOKE: I would like to know your response to the question of discretionary projects. First of all, how they're defined in this particular document and then our ability to modify that. In planning and zoning terminology, discretionary projects, which I believe is how you apply it here, are those projects which actually go to public hearing, variances, conditional use permits, subdivision tracts and so on. And if that's so, then we're really only looking at a sliver of the projects that are in the list.

So if you look on page 3 in the January 21 document it says, "Discretionary projects that fall into one of the seven categories" and now, of course, we've added two more, but it's not really discretionary projects. It's really all the projects that you have just finished describing as commercial and so on and all the ones in this list.

MR. SWAMIKANNU: I think counsel had an opinion on that distinction and a recommendation.

MR. LEON: If you'd like me to repeat it, earlier I mentioned that by virtue of the distinction between discretionary or non-discretionary, we're not excluding those activities that are non-discretionary if those activities are listed as enumerated projects. In other words, those that are listed as enumerated

projects are inclusive both -- in other words, they should be including whether they are or not.

MS. CLOKE: So the top of page 3 it should say all --

MR. SWAMIKANNU: It should be changed.

MS. CLOKE: "All projects that fall into one of these --

MR. SWAMIKANNU: These seven categories.

MS. CLOKE: Well, the nine categories.

MR. SWAMIKANNU: Yeah.

MS. DIAMOND: So "discretionary" would be removed.

MS. CLOKE: It really should say "all projects."

Then I have one more sort of housekeeping question I just wanted to get on the record here. We have a letter in our packet from the City of Long Beach, an e-mail. And in that e-mail it says that Long Beach's understanding is that the only project categories to which the SUSMPs will apply are for home subdivisions, 10 to 99, a hundred-plus, the commercial development and ESAs.

And I believe that there's an answer to that that puts Long Beach on an equal footing with everybody else, but I'd like that answer to be in the record. I'd like that to be explained so that we're clear. One of my problems here is that it's sometimes hard to, you know, to read this and to know what it

really means.

MR. SWAMIKANNU: I can sort of start with some background so that I explain this well. Long Beach was a co-permittee to the 1996 permit, the L.A. County permit. Last year they were issued a separate permit. As part of that process, they prepared a Storm Water Management Plan. So the categories -- beyond these four categories that are listed are addressed in the Management Plan very specifically.

For these four categories, there's a specific requirement in their permit which says Storm Water Mitigation Plans need to be developed. For the other categories, the equivalent best management practices already prescribed in their management plan and the Regional Board adopted that as sufficient at that point in time.

Long Beach has also sought a clarification on the fact that the process which the executive officer recommended to you was to endorse the SUSMP for L.A. -- Los Angeles County and cities before you, as well as adopt applicable SUSMP requirements for the City of Long Beach at the same time. Long Beach wanted clarification that implementation dates for both -- effective dates for both would be the same.

MS. CLOKE: So in writing your staff report and your future reports, can you -- when you bring up the issue of Long Beach, can you make that clear that, in fact, Long Beach and Los Angeles will be

meeting the same standard, though, might be getting to it in two different ways?

MR. SWAMIKANNU: Yes. The staff report indicates that, but I will emphasize that point.

MS. CLOKE: I need to understand that when I read it.

CHAIRMAN NAHAI: Okay.

MR. LEON: Mr. Chairman, I do have a couple of housekeeping issues and two very brief substantive issues.

No. 1, with respect to the record of the proceeding, I think it would be beneficial to designate what the record of the proceeding is in the event that this matter goes up on appeal, and for that purpose, I would recommend that the record contain all staff files for today's proceeding and the transcript, of course, all staff files in the transcript for the August 10, '99 workshop held by staff. The board wasn't present. All staff files and transcript for the September 16th proceeding before the board, all circulated SUSMP proposals, those that were circulated by the staff, all SUSMP proposals from interested parties, all comments received and responses, of course, and, finally, all exhibits that were presented before the board today.

And on that topic, in the event that there's anybody in the audience who hasn't had an opportunity to provide a copy because they may not have anticipated providing a copy, I would -- I would

suggest setting a deadline of, say, this Friday to send it in to the executive officer for inclusion into the record.

CHAIRMAN NAHAI: Okay.

MR. LEON: Another housekeeping item, Miss Lyon, I'm going to advise you not to vote on this item because in your capacity as council person for the City of Rancho Palos Verdes, you're representing a permittee, and the permittees, of course, are subject to the control of this permit. And so that's my advice to you, to abstain from voting on this matter.

Really quickly on two substantive points, while I did step out, I understand that there were comments raised about the applicability of 13360 provision that generally says that the Regional Board cannot by order direct how compliance is to be had with permit provisions and any order of the board.

I just wanted to give you an opinion that I don't think 13360 prohibits the proposal that's before you today for several reasons. First order 96054, which is the Storm Water Permit, requires that the Standard Urban Storm Water Mitigation Plan be developed. Also this is all part of compliance with the Clean Water Act provisions that require the creation of the best management practices.

R0072192

Moreover, the proposal provides that the BMPs are minimum requirements, that the cities are free to require more or additional BMPs through code or by

ordinance, and that's stated specifically on page 2 of 17 of the December 7th, 1999, proposal.

Finally, I wanted to say that with respect to the argument that was had earlier with respect to the permit procedures and whether this process is in compliance with the permit procedures that I believe that we are, in fact, in substantial compliance with those permit procedures, that there have been three or four recitations of the history of this matter, and it quite clearly indicates that the history, the back and forth, the discussions, the meet and confer, even though maybe they weren't specifically described as such, were, in fact, constructive and therefore, in fact, we are in compliance with those procedures.

CHAIRMAN NAHAI: Thank you.

Let's move on to some board discussion, you know, and we can start with, you know, some exchange of viewpoints, maybe if anybody wants to discuss the matter, otherwise we can move on too. Let's start with Dr. Coe.

MS. CLOKE: I was just going to ask if we maybe just wanted to go through the --

R0072193

CHAIRMAN NAHAI: Let's have the discussion between the board members first and then we'll have, you know, the crafting of a resolution and then we'll -- it may be that nobody has anything to say right now and then we'll move straight to that other

step.

MS. CLOKE: Okay.

CHAIRMAN NAHAI: Dr. Coe, do you have any comments to offer?

MR. COE: These are comments not leading to a motion? General comments.

CHAIRMAN NAHAI: Just general comments.

MR. COE: Well, I think it's evident that the staff has done a great job in a short time, but I think it also shows I would like a more orderly process and give the staff more time to get their plan and the resolution that we're to consider all on the same time frame consistent between documents, and, at the same time as they do that, I think they could incorporate some of the things we've heard today from those who have testified.

However, I'm also reluctant to think about postponing action by this board, so I'm sort of groping with an approach that would take care of everything I've said. That's where I stand right now.

CHAIRMAN NAHAI: Well, the approach that could be implemented is that we can make -- since we will -- really what we would be doing here today is giving our executive director direction because this is not formally a board action, what we're doing is encouraging our executive director to take certain action. So that leaves -- that leaves the way open for us to say, you know, "We would like you to adopt this

but with these changes at this time and to further consider, you know, these various aspects."

MR. COE: Yeah.

CHAIRMAN NAHAI: So maybe that's the approach that will address your concerns.

Miss Cloke.

MS. CLOKE: I would like to follow the direction that you've just suggested.

CHAIRMAN NAHAI: Any other comments?

MS. CLOKE: Well, at the appropriate time I would like the opportunity to make those specific comments and the directions for consideration of the board to be -- whether or not they would like to direct Mr. Dickerson and make those suggestions, but I think we should do it as we go through the process.

CHAIRMAN NAHAI: Okay. Miss Diamond, do you have any general comments to offer?

MS. DIAMOND: Well, I think that today is the day that we need to make some decision, and I agree with the process and maybe some things that we want to ask the board -- the executive director to look into. In a conversation that I had with Mr. Dickerson, I think that it was pretty clear that you want direction from us. So the word "encourage" is probably a very strong word, at least I take it that that's how you're taking it.

R0072195

And I would like to reserve comments on specific changes to the plan as it's before us, the

staff report with some amendments that I would like to make too.

CHAIRMAN NAHAI: Mr. Miller, do you have any general comments that you'd like to express?

MR. MILLER: Well, I agree with Dr. Coe in that -- I mean so much has been done, but there's been so many questions raised today that I think we need to take a look before we deal with these things, not stopping the process but taking a look at it.

Settling things like whether they're exemptions or not exemptions. I mean, there have to be some exemptions. For example, where you live, you can't dump water into the ground. You'll slide into the ocean. We have to address those issues. You can't say "No exemptions ever." There have to be some.

Secondly, what concerns me is in cases where we require people to put these things in, how are we guaranteed they're going to be maintained? There has to be some way, some format, for somebody to take care of these things. If it's on private property, fine. You can put a cover, run it through the land and so forth. What happens if it doesn't run with the land? It's for sale or something's done off-site? Are the municipalities or the county responsible? **R0072196**

These are the issues that I'm not clear on and to cast something in concrete at this point, I'm a little reluctant to do until I have a better feeling for it. I would vote to go forward, but I need a lot

of clarification. I'd like to clean up all these questions or a majority of them. You'll never answer all of them.

CHAIRMAN NAHAI: Mr. Shaheen.

MR. SHAHEEN: Yeah. I would say as well -- I mean I -- you know, I guess you could debate a number of these things for I long time, and they've been debated, and, I mean, in my mind, you know, I really would like to move forward with something and make some progress, but definitionally there are a number of things I think need to be addressed.

From my perspective, again, I'd like staff to be able to address those things, and I'd like to be able to move forward, you know, within the framework of this but with better definitions.

MS. LYON: Well, I can't vote, but I can certainly say that speaking from a city's perspective I know that the cities all want clean water, and they want to help in that respect. It's just how we go about it. Everybody in this room wants clean water, so I think we're all going to work toward that end, and I'm sorry that I'm in a position where I can't vote.

CHAIRMAN NAHAI: I was going to say it's a good thing you spoke because we haven't heard the opinions of the cities at all.

R0072197

Let me just say this: I think we must act. You know, albeit with caveats and directions for, perhaps, further investigations as to various things,

but I'd like to say this: One of the speakers earlier on, you know, when he was talking about the building industry and said, "Well, you know, we need to stop the polluters," and, you know, I know that I speak for the rest of the board when I say that there's nobody on this board that regards the building industry in that way at all. I don't know where we would be without our builders, and affordable housing is tremendously important.

But at the same time, I think all you need to do is to fly into LAX during the day, and you'll see that what we've, in effect, done is that we've constructed this massive impermeable slide straight to the ocean, and we must at some point reverse that trend. Otherwise, we're going to really severely damage our coastal economies and otherwise we're going to severely damage exactly what it is that Los Angeles is most famous for, which are its coasts.

So with that, I can -- if everybody wants me to I can -- I think I have a pretty good handle on what kinds of changes and what kinds of directions from a consensus, and I could attempt to provide those on a page-by-page basis, and at any time I step wrong, which I no doubt will, just stop me.

R0072198

All right. With that, I am looking at the January 21st draft, which is the black-lined draft. The first change on this would be at the top of page 3.

MS. CLOKE: Can we start with page 2?

CHAIRMAN NAHAI: Yeah, but it's --

MR. COE: Mr. Chairman, I'm not sure that -- I think each of us might have different individual comments, and I'd be surprised if they were all the same. And I would concur what I think you're about to do is to go page by page through here and then everyone contribute.

CHAIRMAN NAHAI: Okay.

MS. DIAMOND: Well, I think if you look at page 2, you'll find that "discretionary projects" is mentioned, and we may want to deal with that because we were talking about --

CHAIRMAN NAHAI: Yeah. But the way we're dealing with it is at the top of page 3 of this draft, we're going to instead of using "discretionary projects," we're going to use "all projects," and I think that takes care of the problem.

MS. CLOKE: But I think that it should be clear on both pages. I think we should say what we mean in every place. Like, when you wanted to say "both structural and treatment" it should always say -- it should be consistent all the way through the document.

CHAIRMAN NAHAI: Okay.

MS. CLOKE: And the other thing that we need on that first page 2 is some discussion, or at least a direction to staff, to consider and include a start date.

CHAIRMAN NAHAI: Right. We'll deal with that.

MS. CLOKE: But it starts in here "Adopt the requirements set herein," should be -- there should be a within a -- there should be a time frame.

CHAIRMAN NAHAI: Okay. All right. Fair enough.

MR. LEON: Mr. Chairman, excuse me once again. Since the members of the audience have a version different from the one that the board members have, we will need to have clarification. If you're looking at page 2, and I think that matches up with page 2.

CHAIRMAN NAHAI: Well, just follow us through and whatever we refer to just repeat for the audience where we are.

MR. LEON: Very good. We will state the substantive headings that'll be assisting.

CHAIRMAN NAHAI: All right. So the first two changes that we would be suggesting would be in the section entitled "Background." With respect to the issue of effectiveness, what we had discussed earlier, which I think is a reasonable approach, would be six months for the cities to adopt assistant ordinances and with the requirements to take effect 30 days thereafter. So that's what I would suggest there.

MS. CLOKE: And the discretionary one as well?

CHAIRMAN NAHAI: Yeah.

MS. CLOKE: Okay.

CHAIRMAN NAHAI: You're impatient at the end of the day.

MS. CLOKE: I've been here a long time.

CHAIRMAN NAHAI: So has everybody else.

And then in the third full paragraph of the "background" section in the one, two, three, four, five, sixth and seventh line, there is a parenthetical, which is "discretionary projects," and we would suggest that that parenthetical be deleted.

Okay. Over the page, at the very top of the page, again, the word "discretionary" appears, and we would suggest that the word "discretionary" be deleted and replaced with the word "all."

Going down on that page, when it comes to the definition of -- what we would be suggesting is that a definition of commercial development be added along the lines discussed with Xavier when he was at the podium.

MS. CLOKE: One more comment on that page when you're ready.

R0072201

CHAIRMAN NAHAI: Sure.

MS. CLOKE: If you go right where it says the "Regional Board Executive Officer has designated two additional categories," one of the categories are these commercial stand alone parking lots. I think that we want to look at all parking lots. It's going

to have to be rewritten because some of them will be included in commercial developments. Some of them will -- you know, they'll appear in different forms as we go through.

But somehow I would suggest that we ask the executive director to rewrite this so that in one manner or another all parking lots of 25 or more parking spaces are addressed.

CHAIRMAN NAHAI: Oh. So you're not -- you're not talking about the thresholds of 5,000 square feet and 25 spaces?

MS. CLOKE: I'm talking about the words "commercial stand alone."

CHAIRMAN NAHAI: Okay. What you would suggest is that the words "commercial stand alone" be deleted.

MS. CLOKE: Right. And I'm saying -- exactly. And I'm saying that I understand that there will be a variety of mechanisms for addressing this, but I don't want to limit it just to commercial stand alone parking places -- parking lots.

R0072202

CHAIRMAN NAHAI: Okay.

All right. Next I would have a comment on page 4, and this isn't so much of a comment as I guess a direction to staff to review this matter, which is the redevelopment definition. I'm not at the stage where I would want to propose that this language be changed immediately, but I am concerned as to whether

the particular redevelopment, you know -- just the proportionality of it is the comment that I said earlier.

And, Dennis, how can we do this? Can we have your staff review this issue and come back to us, you know, within 30 days or something to provide another recommendation as to this paragraph or -- without delaying, you know, the process of adoption of the SUSMPs.

MR. DICKERSON: If you wish, we could -- we could go back and make the changes that you're requesting, and within a very short period of time I think if we bring back that package to you with the changes that you're recommending tonight and then you could -- the only problem with that is that when you do make those changes and if we bring it back, there's another opportunity for a public hearing, and it could be an extensive opportunity again.

On the other hand, this is something that is fully delegated to me by permit.

Jorge, I need some help here. I mean, how far can we make changes at this point without getting into process problems? **R0072203**

MR. LEON: Well, yeah. It all depends on when we want to have the board take any kind of action. We have, as I've indicated before, provided the public with extensive notice, and as long as the changes that we end up coming back with are extensive, the ten-day

notification is going to be adequate.

CHAIRMAN NAHAI: In any event, all we're doing at this point is basically expressing the opinions to the executive officer to whom the function of adopting these have been delegated.

MR. LEON: And if you don't need to have it back, then you're fine.

CHAIRMAN NAHAI: Well, you know, the humble opinion that I'm suggesting is that this provision may catch a -- you know, a relatively minor expansion and completely miss, you know, 150,000 square foot, you know, addition to a major shopping mall. Now, that doesn't seem logical to me.

So, but -- so I mean, I'm expressing the opinion that I think a different approach should be adopted for redevelopments. Perhaps what we can say is to adopt a minimum amount and say, you know, if you're going to have a 50,000 square foot addition, then regardless of this provision, you know, some kind of Storm Water Mitigation Plan would have to be -- or, you know, put it at a minimum of 100,000 square feet, which is the initial criterion for catching commercial developments anyway.

R0072204

So I'm just expressing that to you for your consideration.

MR. DICKERSON: I think it's a point very well made, and we'll certainly endeavor to incorporate that.

CHAIRMAN NAHAI: Okay. Next --

MR. COE: Mr. Chairman.

CHAIRMAN NAHAI: Yes, sir.

MR. COE: There was a lot of discussion on the definition of "environmentally sensitive area" at the top of that page.

CHAIRMAN NAHAI: Yes.

MR. COE: They refer to three different references where I guess the definition occurs. I think that needs some attention, and there have been some requests that we've heard today that the L.A. County approach should be adopted. I would prefer to just direct them to reexamine it to come up with a single definition instead of three.

CHAIRMAN NAHAI: Okay.

MS. CLOKE: Maybe it's just a map because they're already designated, so maybe it's just the inclusion of a map in this document so that people can understand what the designated areas are, because if you go, for example, to the -- if you're looking at a building permit in a particular area and you can go and see whether you're in that map in that area, so maybe that's what people need just to have that information.

I mean, you know, it's not a definition. It's just information.

R0072205

CHAIRMAN NAHAI: That's fine. We could have a -- I mean our staff's testimony was that those areas are readably ascertainable for anybody who wants

the materials, but you could provide an overlay, could you not?

MR. SWAMIKANNU: What they're asking for is a compilation of those areas and that could be done.

CHAIRMAN NAHAI: If staff can readily determine what these areas are, Dr. Coe, would you then find this definition acceptable?

MR. COE: Yeah. That definition becomes a Regional Board reference?

CHAIRMAN NAHAI: Yes.

MR. COE: Okay.

MS. DIAMOND: On that same page on the issue of parking lots, I am -- I would like to see that changed to "any parking lot, 25,000" -- I think we did talk about that, but on this page, page 4 I believe, we want to make sure that it includes "all parking lots" whether they -- not only stand alone. Any parking lot that's either 5,000 square feet or has 25 spaces should be included.

CHAIRMAN NAHAI: In other words, what you're suggesting is that the definition of parking lot here be made consistent with the reference to it as we've amended it on page 3 of --

MS. DIAMOND: That's right. That's right.

R0072206

CHAIRMAN NAHAI: The next comment I had on this page was that in connection with the definition of a restaurant, we -- I think the suggestion was made

that we add the word "stand alone" before the word "facility" so that we were not under this category catching, you know, supermarkets that have delis, for instance. They would be caught in the commercial development thing. Okay. Thank you.

I have nothing on page 5.

MS. CLOKE: I'm on page 4 still.

CHAIRMAN NAHAI: Okay.

MS. CLOKE: Just a term of art here, this "greater than nine-unit home subdivision," I think if we strike "subdivision" and put in "development" because "subdivision" has a very technical meaning that doesn't always -- that could exclude some nine-home developments and not others or some ten-home developments and not others. So if they just put "any greater than," you know, "ten" -- "greater than nine-unit home development" in terms of projects.

CHAIRMAN NAHAI: But that would then catch apartment buildings. I mean a nine-unit apartment building, you know, in terms of its footprint is hardly bigger than a house, so what we would be doing then if we do that we would be excluding single-family residences that are not on hillside, but we would be catching apartment buildings even though they have a minor impact.

R0072207

MS. CLOKE: But --

MR. LEON: I'm sorry. Quick point of clarification. Xavier points out that the definition

is within the permit and any definitions that are in the permit, such as the permit, constitute a limitation where we do not have any authority to change them.

CHAIRMAN NAHAI: Okay.

MS. CLOKE: Also on that page "retail gasoline outlet," did you have a --

CHAIRMAN NAHAI: Oh. You're talking about the 50 percent of annual gross receipts?

MS. CLOKE: Right. As opposed to if the gas is pumped there that part of the facility -- that pumped gas should be covered proportionally.

CHAIRMAN NAHAI: Is it workable proportionally, or are we in a situation that we say if you're pumping gas, you've got to do the SUSMP?

MR. DICKERSON: I think the latter.

MS. CLOKE: Okay. So that's fine with me.

MS. DIAMOND: All pumping stations should have to meet the SUSMP requirements.

MR. DICKERSON: If they're pumping gas. I think proportionality becomes very difficult to connect.

MS. CLOKE: I was trying to be flexible, but if there's gas there, I think we had need to deal with that.

R0072208

CHAIRMAN NAHAI: Okay. Anything on page 5? On page 6?

MS. DIAMOND: On the conflicts of local

practices, I think the wording of the last sentence, it says "where those practices would defeat or circumvent the intent of the SUSMP requirements." That seems to me very broad and very vague. I don't know how we can reword that, but it just seems to me that we should have standards that everybody standards so that nobody will -- you know, I just think consistency is very important.

CHAIRMAN NAHAI: Well, I think -- I know what it would need to say is that after the word "except" through the end one could delete that and say instead of that, one could say, you know, "provided that," you know, "to the extent that the standards in these SUSMPs are more stringent than those under local codes, such more stringent standards shall apply."

MS. CLOKE: And the reverse. If the local standard is more stringent than the standard --

CHAIRMAN NAHAI: Yeah. That would be understood because it's saying you continue in accordance with local codes, but then the caveat would be "provided that if the SUSMP standards are more stringent" --

MS. CLOKE: Yes.

CHAIRMAN NAHAI: -- "those would apply." So if the local codes are equivalent or more stringent, then those could be continued to be applied.

R0072209

MS. CLOKE: I understand.

CHAIRMAN NAHAI: Jorge, did you want to

do anything with the definition of treatment control BMPs to take care of the situations where -- you know, where it's -- where treatment control BMPs and structural control BMPs can be used interchangeably?

MR. LEON: The idea that we had in mind was to basically include them both in the same place because they basically --

CHAIRMAN NAHAI: Just wherever they appear you go "treatment" or "structural."

Okay. Do I need to go through and point out --

MR. LEON: No. Please, we'll do it.

CHAIRMAN NAHAI: Okay. Anything more on page 6?

Anything on page 7? Wonderful.

MR. COE: Well, Mr. Chairman.

CHAIRMAN NAHAI: I rejoiced too soon.

MR. COE: On page 7 under Item No. 1 -- actually, a general comment. There's two places here that I think the language has been weakened unnecessarily. Under No. 1, the second line, second sentence "development rate for developments where it is reasonably foreseeable," I don't know what that means.

MS. CLOKE: Take it out?

MR. COE: Yeah. And then on No. 2, the third barrel.

R0072210

MS. DIAMOND: What line is that, Jack?

MR. COE: The third barrel under line 2,

"Conserve natural areas," the third barrel, the last sentence there, "wherever practical," I think that ought to come out. I don't think that can be administered if everyone came up with their own idea.

MR. LEON: For the sake -- may I clarify for the audience, Mr. Chairman? The comments that Mr. Coe just made reference to No. 1, "Peak water runoff discharge rates" on page 5 of 17 of the December version, and No. 2, "Conserve natural areas," the small print.

A PERSON: What was the change?

MR. LEON: The recommendation was to delete the words "wherever practical."

CHAIRMAN NAHAI: Okay. Do we have anything else on page 7?

Going on to page 8, I had a comment on the first line of paragraph 4. It says, "Project plans must include BMPs consistent with local codes, codes and ordinances." Should that not really be a reference to consistent with local codes and ordinances or these SUSMPs, I mean, depending on which one of them has the higher requirement?

R0072211

MS. CLOKE: Yes. More stringent.

MR. COE: Staff said they could take care of that earlier.

MS. CLOKE: It should be consistent with what they --

MR. SWAMIKANNU: The idea was that local

codes and ordinances would be modified to adopt the SUSMP.

CHAIRMAN NAHAI: Yes. But since we've already put in the ability of local codes and ordinances to continue, we need to make that change.

At the bottom of the page, third line from the bottom, Dr. Coe had a suggestion that the word "discouraging" be deleted and replaced with the word "prohibited."

A PERSON: Could you tell us where this stuff is?

MR. DICKERSON: We're looking at page 7 of 17 at the very top where it says "Signs and prohibitive language," et cetera.

CHAIRMAN NAHAI: Any comments with respect to page 9?

MS. CLOKE: Page 9.

CHAIRMAN NAHAI: Yes. You don't have to have a comment. No. I was expecting we'd go to the maintenance issue but maybe not. That happens on page 10.

MR. COE: Mr. Chairman, on page 9 --

CHAIRMAN NAHAI: Yes.

MR. COE: -- Item 6, "properly designed outdoor material storage areas," again for the third barrel off "where feasible." I would delete "where feasible."

R0072212

MR. LEON: That's page 7 of 17, under

No. 6.

CHAIRMAN NAHAI: Why am I having difficulty finding it? I see it.

MR. LEON: It's the third bullet point.

CHAIRMAN NAHAI: Thank you. Anything more on page 9?

Okay. Moving on to page 10, now here there are a bunch of treatment or structural BMPs that have to be dealt with, I mean, throughout this paragraph.

But with respect to the issue of maintenance and ongoing responsibility, are we in the situation that we're not going to tell the cities how to accomplish this, or is it appropriate for us to suggest a recorded covenant against properties as to the obligation to comply with maintenance requirements? It's a legal question.

MR. LEON: I think we can suggest it. Ultimately, it'll be up to the cities to come up with what they would like to use, including some of the methods and devices that we talked about earlier, but certainly it wouldn't hurt to suggest it.

CHAIRMAN NAHAI: Okay. So the language would be enabling language. It would say that one device that could be used could be this.

MR. LEON: Exactly.

R0072213

CHAIRMAN NAHAI: Okay.

MS. DIAMOND: I have a couple of things

on that first paragraph on page 10, the word "may," the condition of transfer. It's about four sentences down.

MR. COE: It should be deleted.

MS. DIAMOND: Right. "Will include," not may include.

And the last sentence I think Dr. Coe earlier said not to get rid of the word "encourage." That's too vague.

MR. COE: Yes. "The information shall be transferred."

MS. DIAMOND: "Transfer this information with subsequent sale of the property."

CHAIRMAN NAHAI: Okay. All right. Going on to page 11 and, you know, this brings us to the roofing issue, and we heard a lot of testimony about this. But, you know, I mean, Dennis, this is precisely one of the issues -- I mean we heard about fecal coliform from birds. We heard about aerial deposition. We heard about water quantity as well as water quality.

You know, it kind of leads me to think that perhaps this shouldn't be included at this point but that either you should be encouraged to go and take a look at this issue a little bit more before it is included, you know, by a reopener if necessary or something of that nature. How would that work?

MS. DIAMOND: Are you saying it should not be an exemption?

R0072214

MS. CLOKE: You're saying to delete?

CHAIRMAN NAHAI: Everybody can give their suggestions. My feeling about it is that we don't -- that roofing surfaces -- the roofing surfaces exemption at this point should not be included but that it may be that additional studies or facts may come to light that may additionally justify its inclusion at some time in the future.

But I really -- I think, you know, to the extent that -- one of the problems is that we have 50 percent of our rainfall just running off into the ocean, and I don't think having a roofing exemption helps that issue at all, you know, even if it doesn't add to the polluting loading, which it well might.

So I don't know. You tell me what you think. I'm open to all kinds of persuasion, especially at this time of the day.

MR. DICKERSON: As written, the provision provides that roofing material -- in order for the exemption to be in place, that roofing materials -- or rather that the -- I was simply trying to build some flexibility that would allow us to consider the notion that if you add this material -- if you add this volume of water, which in some cases will be actually half of the volume of water from a 100,000 square foot commercial development, I'd say you really have to build bigger BMPs. It's going to cost more.

R0072215

And if intrinsically the water is cleaner, much cleaner then the water that's coming off

over the ground, you're basically adding a lot of clean water to a system that could be far more efficient without having to deal with that, and that's simply a common sense practical approach that I've taken.

If you'd like me to add some language that would help this along as if we made an affirmative showing that under certain conditions that indeed the rooftop runoff does substantially contribute to the pollution, that would go a long way.

MS. DIAMOND: The problem that I have with it is that I think we should err on the side of caution. Since there have been no studies and since we know that runoff is considerable and that this rooftop runoff is not going to be percolating into the ground if we don't have some BMPs, if it's not included, it's just more impermeable surface.

I mean, whether it's up at the roof or down at the bottom, some of it's going to end up in the streets, and it's going to be continuing along into the ocean. I don't -- I really don't believe we should have an exemption for rooftops until such time we get some definitive studies that show that it doesn't contribute to pollution. I mean, I feel very strongly that this is one exemption that should not be included, and we should not have an exemption for rooftops. It's way too big.

MR. LEON: The provision under discussion is on page 9 of 17 at the top of first full paragraph.

MS. CLOKE: I'd like to add to that. I mean we have had a lot of testimony today, and we also have letters from the EPA and the EPA strongly --

MR. COE: January 13 letter.

MS. CLOKE: Yes. I'm referring to a January 13th letter where the EPA says that "We are also concerned, however, that the Regional Board's proposal would exclude roofed surface areas in certain circumstances in the calculation of rainfall runoff. We believe that this provision could prove overly broad and may hinder implementation, and we would recommend that it be removed."

I am also looking at a letter from Elizabeth -- excuse me, now I'm going to have a name problem -- Chetel and talks about -- where she says that "the exclusion of the area roofing requires the explanation that roofs are impervious surfaces that divert water into storm water drains and reduce percolation to groundwater reservoirs. Due to the air quality in Los Angeles County, the Ph of roof storm water could be quite low especially first flushes.

"In addition, considering the additional volume of water shed from roofs accounts for a high percentage of the impervious surface area and that the calculation minus the roof area will guarantee undersized treatment of control BMPs and inadequate control of first flushes through treatment structures and that these failures and complaints could be avoided

if we included these."

And I'm not going to read everything into the record that's in here, but over and over again the rooftop area was referred to in studies by scientists and books that we had, reports that have been done, and if you look at Los Angeles, as you said, if you come in, you know, in an airplane and you look down, you can see how much of the city is covered in -- how much of the area of the city is covered in rooftops.

We hope that these rooftops are impervious. We all hope that our roofs don't leak and -- although, sometimes I have to convince -- admit that mine does and --

CHAIRMAN NAHAI: Maybe there's the answer to the whole problem. Make the roofs leak.

MS. CLOKE: And so I think it's terribly important that this entire exclusion be eliminated at this time. I think that this board always, as it should, is open to new information, and if new information comes to us in the future that this should be had amended, we're always open to that, but at this moment, I can see no common sense reason or practical reason for allowing this exclusion.

CHAIRMAN NAHAI: Ultimately, this is your call, Dennis.

But do we have any other opinions from board members on this issue or guidance?

MR. SHAHEEN: I guess intuitively, I

guess, my initial reaction -- the only thing I've heard too would be that it doesn't belong in there as an exclusion, but, I mean, the thing that concerns me is the fact of the cost estimates made this a big part of it, and I'm all for taking board dollars but applying them, I guess, to the problem, I guess I'm a just little concerned. I don't have enough information if that doubles now the preventive measures that would take place to support it if you took that exemption out.

I mean I don't know. I just struggle a little bit with making sure that we've solved the problem with the dollars that are being spent.

MS. DIAMOND: I'd like to respond to that. It seems to me that all of the other cities around the country that have done this, none of them have rooftop exemptions, and we've seen studies that show that the costs are quite low. I mean, in terms of the cost of doing business, they were like .5 percent. Some of them were .3 percent.

MR. SHAHEEN: Were the costs that we saw today based on this exemption being in or out?

MS. DIAMOND: Not from other cities. There are no other rooftop exemptions in other cities.

MR. SHAHEEN: But the cost -- I guess I was referring to the costs that we saw today that were presented.

R0072219

MS. DIAMOND: I -- some of the BMPs that

I think are required to take off the -- to move the runoff, I don't think they're that expensive. I happen to have a roof, and we have ways of keeping the water -- getting the water from my roof into the garden, and it was a very inexpensive thing to do, so I'm not -- I don't think it's a major cost.

MR. COE: That's a thought that keeps coming to my mind. It doesn't have anything to do with Storm Water Pollution Prevention. It's water conservation. There's a big opportunity for that, but that's another subject for another day.

I think this would be a little hard to administer too. You have to monitor, see if there's pollutants coming off the roof and off the air conditioning ducts and so on. And I'm persuaded by the fact that the EPA is against it.

CHAIRMAN NAHAI: So --

MS. DIAMOND: The only thing commonsensical about it is I think that it would encourage as many rooftops as possible, and we'll have rooftop to rooftop development if we have this kind of an exclusion.

CHAIRMAN NAHAI: I don't know if that's going to happen.

MR. MILLER: I don't agree with that because you have zoning laws that prevent that. You can't change a zoning law just because you have an EPA requirement or a requirement from us.

CHAIRMAN NAHAI: I don't think we're going to find builders, you know, wanting to build these massive roofs just in order to avoid putting a little grassy patch down.

MS. CLOKE: Well, roofs cost money too. Building roofs cost money. I wanted to respond to something that was said down the table which is -- was the question of whether the percentage point applied, whether there was a roof inclusion in that calculation. As I remember it, the roof was in -- there was no exclusion, if I'm just saying that correctly, and also to point out that this -- there is no other city in that whole long list of cities across the United States that have implemented -- and states across the United States that have implemented these programs that has a rooftop exclusion. I mean, -- there's no precedent for it.

And in addition to that in terms of the cost I think that because of your own building experience, you know that this is really the least expensive and lowest tech opportunity for decreasing volume into the storm water system, and volume is -- it's not just water concentration. It also, you know, carries the pollution farther out, carries pollution, as we saw, in the Tapia report.

CHAIRMAN NAHAI: All right. Let's move on then. Do I have any other comments with respect to page 11?

MS. CLOKE: Could I just have somebody explain the restaurant issue to me? I'm not sure --

CHAIRMAN NAHAI: But that's the next issue.

MS. CLOKE: No. I mean, I'm not quite sure where we are on --

MR. COE: Exclusion. In the middle of the page.

CHAIRMAN NAHAI: Yes. That's still on page 9.

MS. DIAMOND: That's the next issue.

MS. CLOKE: I'm sorry. I was on the wrong page.

CHAIRMAN NAHAI: So the issue with respect to the restaurants is this: What restaurants -- it says, "Where the land area for development or redevelopment is less than 5,000 square feet or excluded from the numerical BMP design standard requirement," and the issue that arises here is whether smaller fast-food takeout operations which are smaller than 5,000 square feet should be excluded.

Now, it may be that under the 1996 permit we're constrained, and we can't do anything. You're shaking your head at me.

MR. SWAMIKANNU: Yes. Mr. Chairman, the issue here is for restaurants to already have the requirements. The requirements are two categories. One is soil control pollution prevention. And the next

requirement is to mitigate storm water the first three-quarters of an inch.

This exclusion is from the requirement to mitigate storm water from three-quarters of an inch only. So it's the numerical limit standard that doesn't apply.

CHAIRMAN NAHAI: I understand that. But the issue I think is why shouldn't the number be 2,000 square feet or 2,500 square feet?

MR. SWAMIKANNU: I provided an explanation using what's done ordinarily around the country.

CHAIRMAN NAHAI: Okay. So you're -- yeah. You said that you adopted this based on the standard that has been adopted around the country.

MR. SWAMIKANNU: Country, yes

CHAIRMAN NAHAI: You know, that's good enough for me. I mean, if that is the standard and that is what has been done around and that is what has been determined to be effective --

R0072223

MR. SWAMIKANNU: Sort of the threshold I guess for more quantity because below 5,000 we have all these soils controls you have to start your restaurants. So whether they increase traffic or not, when they open or not, things like that. Here the requirement is basically to treat these quantities --

CHAIRMAN NAHAI: So what you're saying is that with respect to takeout establishments below 5,000

square feet, there are already sufficient requirements in place to ensure that they do not significantly contribute to urban runoff --

MR. SWAMIKANNU: Yes.

CHAIRMAN NAHAI: Is that what you're saying to me?

MR. SWAMIKANNU: Yes.

MS. CLOKE: As I read this, and we might be able to make this -- they are only excluded from the numerical design standard, but that they have to implement the BMPs.

CHAIRMAN NAHAI: But I think it says that.

MS. CLOKE: Okay.

CHAIRMAN NAHAI: It says "are excluded from the numerical BMP design standard requirement." We said right in the definition, in the definition clause, there will be a definition of "commercial development."

Moving on now to page 12. Dr. Coe, you had a change in paragraph 3?

MR. COE: Yeah.

CHAIRMAN NAHAI: The word "consider" you wanted changed.

MR. DICKERSON: Yes. This is at page 10 of 17, Section 3 "Properly designed vehicle equipment wash areas."

R0072224

CHAIRMAN NAHAI: I imagine you would want

to delete the word "consider" and change "including" to "include."

MR. COE: Well, I -- well, starting with "to alleviate this problem," I've eliminated that as a possible approach here and start at the end of "considering inclusion of the project plans and area." Delete everything up to that point and start off with "Therefore, any such area for washing, steam cleaning of vehicles and equipment is included in the site design, must meet the following." It doesn't sound too smooth but --

CHAIRMAN NAHAI: Let me just repeat my suggestion to you, Jack, and you may think that it works, and we could just say "To alleviate this problem," comma, "include" instead of saying "consider including," just say "include." In other words, it would be a directive. "Include in the project plans an area for washing/steam cleaning of vehicles and equipment."

MR. COE: That would be fine.

CHAIRMAN NAHAI: Anything more on page 12?

R0072225

Anything on page 13?

Anything on page 14?

MS. DIAMOND: Yes. Well, there was just -- I think it was also a housekeeping in the first paragraph, the word "consider" is used again. Just change that to "include" that the vehicle equipment

wash areas --

MR. DICKERSON: Yes. We're at page 23 of 17 at the top.

MS. DIAMOND: Sorry. And then further down "parking lots," the way it's worded now parking lots are -- unless we've changed that, it's getting so late I'm beginning to forget what we've done. We don't want them -- or I would suggest that they not be commercial stand alone parking lots.

CHAIRMAN NAHAI: No. Because we now have -- your "parking lots" is a term of art in the document, and it's now defined simply as parking lots, 5,000 square feet or more or with 25 or more parking spaces.

MS. DIAMOND: So we've taken care of that.

CHAIRMAN NAHAI: Yes. So yes, that's taken care of. Anything else on page 14?

Okay. Moving on to page 15, we need to consider some language clarifications with respect to the waivers, and we need to decide the question of where the waivers come before the board or before the executive officer.

R0072226

MR. DICKERSON: Okay. We're at page 13 of 17 at the top, No. 11, "Waiver."

MS. CLOKE: Well, one of the things that we discussed was adding a clarification regarding the exhaustion of all BMP options before it was possible to

even consider a waiver. We talked about adding that clarification. That was one of the issues.

CHAIRMAN NAHAI: What if we did this: What if in subparagraph 2 little i's where it says "unfavorable or unstable soil conditions at a site to attempt infiltration," after the word "infiltration," we add a parenthetical that says "Provided, however, that the foregoing shall not" -- "shall not waive other BMP options" or something of that nature.

I don't know, Jorge. You're the lawyer.

MR. LEON: Yeah. But you've got the big chair over there.

CHAIRMAN NAHAI: I'm not a lawyer here.

MS. DIAMOND: There was some testimony that -- there was some testimony today that there would be some BMPs that could be applicable and practical in almost any situation. Almost. So could we add language so that there would be some BMPs considered if these were not possible?

MR. LEON: Yeah. The idea is to rewrite this so that it's not an entirely usable as an escape clause.

MS. DIAMOND: Right.

R0072227

MR. LEON: Because it defines a reasonable argument, perhaps, that says that you can't use infiltration, then somebody could say we're not going to use anything then.

CHAIRMAN NAHAI: I'll tell you what we'll

do. Right after the word "surface," with the sentence that finishes with the word "surface," what if we add there a sentence that goes "impracticability as to any particular BMP shall not excuse or waive application of any other available BMP or practical BMP." How about we do that?

MR. LEON: It seems to me that that continues to apply to the other BMPs.

CHAIRMAN NAHAI: All right. So you have that language basically.

Okay. The next change with respect to this paragraph was again a change Dr. Coe offered, if I may, Jack, which was that instead of just talking about where the groundwater is less than 10 feet from the soil surface that we also refer to unconfined aquifers.

MR. COE: Yes.

MR. DICKERSON: Yes.

CHAIRMAN NAHAI: And, Dennis, regarding the issue of other waivers coming back to us, I am wondering whether it would be practicable to say that waivers would come back to the Regional Board but that the Regional Board reserves the right to delegate, you know, the possibility of giving waivers to the executive officer. That way if we get a class of projects that are deserving of waivers, then we could define them and we could just delegate the waiver giving authority down to the staff level, if you think that-that's workable.

MR. DICKERSON: We will make that work. It sounds good.

CHAIRMAN NAHAI: All right. Anything more on page 15?

MR. LEON: Just a real quick question of clarification on that point. The discussion as I understood it when the parties commented seemed to be concerned about, in the first instance, the permittees being able to provide the waiver. Are you now suggesting that it's the executive officer and/or the board under the conditions that you just stated?

CHAIRMAN NAHAI: Yes.

MR. LEON: Ought to be the ones, not the permittees.

CHAIRMAN NAHAI: Yes.

MR. LEON: Thank you.

CHAIRMAN NAHAI: And I would note for the record that the language that's before us does not contemplate the permittees being the arbiters of whether a waiver is appropriate or not. It says the executive officer. All that I'm suggesting is that instead of the executive officer would be -- would be vested in the Regional Board but with the Regional Board having the express right to delegate that authority to the executive officer.

R0072229

MR. LEON: Okay.

CHAIRMAN NAHAI: Okay. Anything more on page 15?

Anything on page 16?

MR. SWAMIKANNU: Mr. Chair, before you go on, on the waiver provision, I think we have three specific situations where you already recognize the authority to issue waiver.

CHAIRMAN NAHAI: Yes.

MR. SWAMIKANNU: These are for any other conditions.

CHAIRMAN NAHAI: Yes. Correct.

On page 16, any comments, perhaps, on suggested resources or how to get a copy of them? Nothing on page 17.

MR. COE: Sixteen, the editorial, this is the beginning of Table 1. Do you need the table number and the title?

MR. SWAMIKANNU: Table 1 begins on 16, and it has a title.

MR. COE: Right. Mine doesn't.

MR. SWAMIKANNU: Mine doesn't either, but I'm fixing it now.

MR. COE: Very important.

CHAIRMAN NAHAI: Do we need to take a vote, or we're just providing suggestions?

MR. LEON: That's exactly what I wanted to discuss next. There is an outstanding issue that may require board action, that is, the applicability of the provisions to the Long Beach Municipality as a separate permit. As I understand it, we've been

provided to the executive officer in terms of suggested points to consider are -- well, exactly that. Suggestions.

CHAIRMAN NAHAI: I think it's a little stronger than that. I think the executive officer asked for the board's directions, and we've provided them.

MR. LEON: If you're going to give directions, then we should have a motion that provides the foregoing comments directed to the executive officer to be considered for the rewrite but we still do have --

MR. DICKERSON: The resolution.

MR. LEON: We do have a resolution, but the resolution is now changed somewhat. We'll have to change the terms of the resolution to capture --

CHAIRMAN NAHAI: To incorporate these amendments.

MR. LEON: -- the board's motion.

CHAIRMAN NAHAI: Okay. Then I'll -- the motion is for what now? How does one --

MR. LEON: I would suggest a motion that -- from the board to direct the executive officer to modify -- issue a proposal --

CHAIRMAN NAHAI: To adopt and modify?

MR. LEON: Right. That's Issue No. 1.

Issue No. 2 is with respect to the City of Long Beach we have to figure out what we want to do

here.

CHAIRMAN NAHAI: Let's deal with Issue No. 1 first. Okay. So I'll move the direction to the executive officer to adopt and amend the SUSMPs before us in accordance with the directions or suggestions that we've just provided.

MS. CLOKE: I'll second that.

CHAIRMAN NAHAI: We have a second.

All in favor?

ALL: Aye.

CHAIRMAN NAHAI: Any opposed?

And we have an abstention from Marilyn Lyon.

Now, what is the second issue?

MR. LEON: The second issue is the applicability of the SUSMPs to the City of Long Beach. As you know they're treated under a separate permit, and I might inquire of the city's representative as to what they want to do. The options are these: No. 1, let's just let it carry over so that we can come back and take a board action at a later date that imposes the SUSMPs in accordance with the modifications that Dennis Dickerson will be making.

CHAIRMAN NAHAI: Is it part of our agenda to impose it today?

R0072232

MR. LEON: It is. It's noticed as an agenda item for the board to take action.

CHAIRMAN NAHAI: Why would we delay it

then?

MR. LEON: Well, that's another option. It's in the resolution.

MS. CLOKE: I thought we agreed that everything that Long Beach was --

CHAIRMAN NAHAI: The question is whether it's part of our agenda today.

MR. DICKERSON: It might be best to, since we're specifically taking a formal action to modify another permit, make sure we have all the noticing issues properly done for that for us to rewrite and adopt and then to bring it back for formal action to apply for Long Beach. Does that make sense?

MR. LEON: That would work.

CHAIRMAN NAHAI: That's your recommendation?

MR. DICKERSON: I'm thinking just to make it perfectly clean.

CHAIRMAN NAHAI: Okay. We've made our position clean. I don't mind.

MR. COE: And the action by the -- the future action by the board on this would be Long Beach only.

R0072233

CHAIRMAN NAHAI: Yes.

MS. DIAMOND: And the SUSMP as it's been amended or suggested for amendment to you that apply to Long Beach, would that be a motion before us that would apply to Long Beach, this permit?

MR. DICKERSON: Yes.

CHAIRMAN NAHAI: Well, let's do that. When would you defer it to?

MR. DICKERSON: It's going to take a little time. Probably the April meeting.

CHAIRMAN NAHAI: So moved.

MS. CLOKE: Is that their start date?

MR. LEON: I'm missing something here that is noticed here.

Xavier, could you explain?

MR. SWAMIKANNU: On -- in the tentative resolution also we asked that the board adopt this numerical standard to apply under the State's Storm Water General Permit for post-construction BMPs in the Los Angeles region and --

CHAIRMAN NAHAI: With respect to the resolution we're going to have, we're going to take a vote on the resolution, but I think -- when you're saying that, are you referring specifically to Long Beach?

MR. SWAMIKANNU: No. No. That's the third item.

CHAIRMAN NAHAI: Yes. I think we can go ahead and take a vote on the resolution which would have been modified by the suggestions that we've just given.

R0072234

MR. SWAMIKANNU: Yes.

CHAIRMAN NAHAI: So as to the -- and then

it refers specifically to action to Long Beach until the April meeting. Will that satisfy you?

MR. LEON: That does.

MS. MALMSTEN: Mr. Chairman, I'm sorry. I realize this is not part of your procedure, but I am -- and I spoke with Jorge. I am Lisa Malmsten. I'm with the city attorneys' office in the city of Long Beach.

And I share your interest in creating a clean procedure, and what I had expressed to Jorge is I think you have a potential of unlawful delegation issue on something that you need to take official action on, you leave a part of the box not filled out yet, and I think that's what Dennis is talking about doing and bringing back.

So my suggestion that would make it cleaner might be to delete reference to Long Beach from the resolution tonight. If you -- people have concerns -- members of the board have concerns about Long Beach's implementation program, we have staff here that can speak to how vigorously the BMPs are being produced in the city of Long Beach and how our Storm Water Monitoring Program is kicking in, if that's the concern.

MS. DIAMOND: How would it hurt Long Beach if it was included in the resolution?

R0072235

MS. MALMSTEN: The concern is whether the .75 be implemented any sooner for Long Beach than for

anybody else. We're starting to create a really muddy record here, and we want to be protected just as much as you do.

If there's a clear statement from the staff that the items in the BMP will not be adopted -- I mean, excuse me -- not be required to be implemented in the city of Long Beach until they are adopted for everybody else, we would be comfortable with that.

MS. CLOKE: But we are adopting it for everybody else and we've put a six-month date for cities and a 30 day beyond that date for implementation for individual permittees, for individual permits.

MR. DICKERSON: We're recommending that Long Beach be formally considered with proper notice with revised language in April.

CHAIRMAN NAHAI: I think that's okay as long as we don't then have an argument about the numeric limit. That's what I don't want to have.

MS. CLOKE: But that's what -- the lady just said she doesn't care.

R0072236

CHAIRMAN NAHAI: I know.

MS. MALMSTEN: I didn't say I didn't care. What is it --

MS. CLOKE: You said that as long as it was the same for you and everybody had the same dates that --

MS. MALMSTEN: As long as the -- if there were numerical standards adopted, that they be the

same.

MS. CLOKE: Right.

MS. MALMSTEN: And that the implementation be a consistent implementation date.

MS. CLOKE: And that's our contention.

MS. MALMSTEN: I would -- okay. There is one more thing. If you delay to April and you're talking about things that require amendments to our general plan, we'll need the six months just like everybody else needs the six months. So I don't know where we are.

MS. CLOKE: So let's not delay.

MS. MALMSTEN: I'm very confused.

MS. CLOKE: Let's vote at the same time that we vote for everybody. No. I'm backwards?

MS. MALMSTEN: The problem is things aren't flushed out yet. If we had a document that said this is what it is now, after the directors had an opportunity to make his changes pursuant to your recommendations -- and I have to tell you that we haven't had the copies. We've been trying madly to keep up with the changes, and we're not at all clear, I think I probably speak for most of the audience, on what changes you've made. So they'll have to come back.

R0072237

I have a bit of a conundrum. One of the things that I suggested was continuing the public hearing as to Long Beach. Obviously, we need to, you

know, see what there is and have an opportunity to comment, but you don't need to set up a whole new big hearing on this. There ought to be an interim procedure, and perhaps Jorge has a suggestion. Dump it back to you.

CHAIRMAN NAHAI: Well, I think if it's merely a matter of providing a clear document to Long Beach, that's one thing. But I believe it's the board's intent that we direct that the numeric limits be applied. We've decided on the six months' time limit plus thirty days. With respect to the exclusion of rooftops, we've given that direction.

The one position -- the one thing that I would think would not be tolerable is for Long Beach to come back and attempt to have a second viewing and a second airing of those issues. So that's where -- because that would be -- that would not be fair to the other permittees. And if that's what's going to happen, then I would rather we just go ahead and adopt it for Long Beach the same way as we have for the other cities under the county-wide permit.

But if it's just simply a matter of having the clean document with the changes, giving that to Long Beach, having them come back for the adoption of the same standards as to the city of Long Beach as we've adopted with respect to the other permittees, then that's fine.

R0072238

MS. CLOKE: Mr. Chairman, I think that if

we do that, we are going to have a lot of other cities that are going to be asking for exactly the same treatment. I think we should treat everybody equally tonight.

MS. MALMSTEN: You have two different permits before you.

MS. CLOKE: I understand that, but our action applies to all, to both, to all the cities, and I think that -- I think that it's a -- more appropriate and not showing any kind of special treatment if we say that this that we've passed applies to everybody.

CHAIRMAN NAHAI: Well, I need to have a staff recommendation.

MS. MALMSTEN: I could --

MR. DICKERSON: I -- everything that I'm aware of in discussions with the city of Long Beach, and please clarify this, is that you know now what the board has adopted. They've certainly adopted the .75. There's no question about that. There are some language changes as well. But the .75 has been the big critical issue, and it's clear that that is what the board's intent is. It's clear that that is what the board will consider, and should we do it back in April, that is formally what will be before the board for adoption.

R0072239

And I think as long as you're willing to say that you don't have any problem at this point in renewing the challenge to 75, then we could probably

proceed.

MS. MALMSTEN: I could phrase that by pointing out that by having a public hearing doesn't mean you continue public comment. I can agree with everything you say so long as whatever legal rights we have this evening continue to apply so that we are not waiving anything by failing to raise any legal points we may have between now and the next hearing.

MS. DIAMOND: This is feeling very muddy to me.

MS. MALMSTEN: It is very muddy. I agree with you.

MS. DIAMOND: I would rather -- and I'm not going to offer it, but I would rather find a solution in the form of a motion so that whatever Dennis comes up with from our direction tonight for long -- for L.A. County and the other permittees will apply to Long Beach at the same time.

MS. CLOKE: And so that they have the same start date as everybody else.

MS. DIAMOND: And the six months begins at the same time.

MS. CLOKE: So that there's an equal responsibility throughout the region.

R0072240

MR. DICKERSON: Then in the resolution there's Item 3, "The Regional Board adopts the approved requirements as provisions applicable to the SUSMP requirements for the City of Long Beach." That covers

it, Jorge, does it not?

MR. LEON: Yes.

MR. DICKERSON: So we adopt the resolution with that language included.

CHAIRMAN NAHAI: Let's do that then.

MS. MALMSTEN: I would just like to register that we think there's an unlawful delegation issue, so we've preserved that issue. Thank you.

CHAIRMAN NAHAI: All right. Then in that case, what would our motion need to be with respect to the resolution and the amendment?

MR. LEON: I think we're at a point where the motion could be just adoption -- a motion for adoption of the resolution as is.

CHAIRMAN NAHAI: As is subject to the amendments that we've given to the executive officer?

MR. LEON: Correct.

CHAIRMAN NAHAI: Could I have a motion to that effect, please?

MS. DIAMOND: I so move.

CHAIRMAN NAHAI: Second?

MS. CLOKE: Second.

CHAIRMAN NAHAI: All in favor?

ALL: Aye.

CHAIRMAN NAHAI: Any opposed? **R0072241**

And Marilyn Lyon abstains.

Does that conclude it? Yes, it does. No other motions are necessary.

I'd suggest that we adjourn. Thank you very much everybody. Thank you for the excellent presentations.

(Proceedings concluded at 6:45 p.m.)

* * *

STATE OF CALIFORNIA

I, Jennifer Alaniz, CSR No. 10992, a Certified Shorthand Reporter in and for the State of California, do hereby certify:

That the foregoing proceedings were taken down by me in shorthand at the time and place named therein and were thereafter transcribed under my supervision; that this transcript contains a full, true and correct record of the proceedings which took place at the time and place set forth in the caption hereto.

I further certify that I have no interest in the event of this action.

EXECUTED this 8th day of FEBRUARY, 2000.

JENNIFER ALANIZ

BLANK

California Regional Water Quality Control Board
Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640
Internet Address: http://www.swrcb.ca.gov/~rwqcb4

Gray Davis
Governor

Notice of Public Meeting/Hearing

Serving Coastal Los Angeles & Ventura Counties

Thursday, April 22, 1999 ***419th Regular Board Meeting***
9:00 a.m.

City of Camarillo, Council Chambers
601 Carmen Drive
Camarillo, California

Agenda

Submittal of Written Material for Regional Board Consideration

To ensure that the Regional Board has the opportunity to fully study and consider written material, it is necessary to submit 15 copies at least five (5) days before the meeting. This will allow distribution of the material to the Board Members and appropriate staff in advance of the meeting. Pursuant to Title 23 California Code of Regulations Section 648.2, the Regional Board may refuse to admit written testimony into evidence unless the proponent can demonstrate why he or she was unable to submit the material on time or that compliance with the deadline would otherwise create a hardship. If any other party demonstrates prejudice resulting from admission of the written testimony, the Regional Board may refuse to admit it. If you are reading a statement at the meeting, please provide the Executive Assistant with a copy at the meeting.

The Board will recess for a 15 minute break at approximately 10:30 a.m. and recess for lunch at approximately 12:30 pm. The meeting will reconvene at approximately 1:30 pm.

Pledge of Allegiance.

1. Roll Call and Introduction of New Board Member(s).
   [Robyn Goodman, 213/576-6613].....Board Members Present

2. Board Member Designations.

   2.1 Report of Nominating Committee and Election of Officers.
   (The Board will elect a Chair and Vice-Chair for 1999.).....Board Action

   2.2 Designation of Board Member Representatives for Santa Monica Bay Restoration Project (SMBRP) and other Entities.
   (The Board will designate member representatives.).....Board Action

3. Order of Agenda.....Board Direction
(The agenda items are numbered for identification purposes only and will not necessarily be considered in this order).

4. Approval of Regular Meeting Minutes of December 14, 1998.
[Robyn Goodman, 576-6613].....Board Action

5. 1998 Board Outstanding Achievement Award. *(The Board will present a staff person(s) with the Board Outstanding Achievement Award for 1998.)*
[Dennis Dickerson, 576-6605].....Board Action

6. Resolution of Appreciation for Past Board Members John Slezak, Past Chairperson and Charlotte Craven, Past Vice-Chairperson. *(The Board will present both past members with a Resolution of Appreciation for their service on the Board.)*.....Board Action

7. Board Member Ex Parte Communication Disclosure.
[Jorge Leon, 916/657-2428].....Information/Discussion
(Board Members will identify any discussions they may have had requiring disclosure pursuant to Government Code Section 11430.40.)

8. Uncontested Items Calendar.....Board Action
(Items marked with an asterisk are expected to be routine and noncontroversial. The Board will be asked to approve these items at one time without discussion. If any interested party, Board Member, or staff person requests that an item be removed from the calendar, it will be taken up in the regular agenda order.

9. Public Forum *(Any person may address the Board regarding any matter within the Board's jurisdiction. This need not be related to any item on the agenda. Remarks will be limited to three (3) minutes.)*

WASTE DISCHARGE REQUIREMENTS

10. **Consideration of NPDES Requirements – New, Renewal, Rescission**.....Board Action
(After a hearing, the Board will be asked to adopt or rescind the proposed permits for the following facilities.)

New

*10.1 West Basin Municipal Water District (Carson Regional Water Recycling Project), Carson [Mazhar Ali, 576-6652].....CA0064246

Renewal

*10.2 California Department of Water Resources (William E. Warne Power Plant), Pyramid Lake [Ha Nguyen, 576-6658].....CA0059188

Rescission

*10.3 Riverbank Bulk Water, Wilmington [Kwang Lee, 576-6666].....CA0055964
*10.4 Aratex Services Inc., Long Beach [Kwang Lee, 576-6666].....CA0063045
*10.5 Sta-Lube, Inc. (3039 Ana Street), Rancho Dominguez
[Gary Schultz, 576-6665].....CA0064025
*10.6 Bethlehem Steel Corp. (Vernon Industry Plaza), Vernon
[Gary Schultz, 576-6665].....CA0060755
*10.7 Ventura Regional Sanitation District (Nyeland Acres Wastewater
Treatment Plant), Oxnard [Veronica Cuevas-Alpuche, 576-6662].....CA0059005
*10.8 Santa Clarita Community College District (College of the Canyons),
Santa Clarita [Ha Nguyen, 576-6658].....CA0055565
*10.9 Ventura Harbor Boatyard, Ventura [Ha Nguyen, 576-6658].....CA0058998
*10.10 Southern Pacific Milling Co. (Santa Paula Facility), Santa Paula
[Ha Nguyen, 576-6658].....CA0000981
*10.11 Los Angeles Times, Los Angeles [Gary Schultz, 576-6665].....CA0061913
*10.12 Los Angeles Times, Los Angeles [Gary Schultz, 576-6665].....CA0060666
*10.13 L and R Auto Parks, Inc., Los Angeles [Gary Schultz, 576-6665].....CA0062171
*10.14 Robert Chan (B.C. Plaza), Los Angeles [Gary Schultz, 576-6665].....CA0060607
*10.15 Maguire Thomas Partners, Los Angeles [Gary Schultz, 576-6665].....CA0062065
*10.16 College Spring Partnership, Los Angeles [Gary Schultz, 576-6665].....CA0061182
*10.17 Alpha Therapeutic Corp., Los Angeles [Dan Radelescu, 576-6668].....CA0058777
*10.18 Lubricating Specialties Co., Vernon [Dan Radelescu, 576-6668].....CA0059978

11. **Consideration of Non-NPDES Requirements – New, Revision, Rescission**.....Board Action
(After a hearing, the Board will be asked to adopt or rescind the proposed requirements for the following facilities.)

New

*11.1 San Gabriel Basin Water Quality Authority (So. El Monte Operable Unit),
So. El Monte [Ejigu Solomon, 576-6727].....99-022
*11.2 RAMCO Newhall Company, Ventura [David Hung, 576-6723].....85-16

Revision

*11.3 Hathaway Children's Services, Lakeview Terrace [Magdy Baiady, 576-6699].....68-30
*11.4 The Marblehead Land Company (Point Dume Club Wastewater Treatment Plant),
Malibu [Ahmad Lamaa, 576-6716].....68-071

*11.5 Ventura Port District (Maintenance Dredging), Ventura
[Michael Lyons, 576-6718].....79-059
*11.6 Dominguez Energy Limited Partnership and Dominguez Properties,
Limited Partnership, Carson [Rebecca Chou, 576-6733].....86-075

Rescission

*11.7 Texaco Exploration and Production, Inglewood [Rebecca Chou, 576-6733].....84-14
*11.8 Church of Scientology (Western United States Canyon Oaks Ranch School) [Ahmad Lamaa, 576-6716].....92-086
*11.9 SPV Sanitation District Inc. and Williams Homes Inc., Agua Dulce [Bryan Schweickert, 266-7520].....89-022

ENFORCEMENT ISSUES

12. Administrative Civil Liability (ACL) Complaints for Failure to Submit Annual Reports Against the Following Permittees of the General Permit on Storm Water Discharges Associated with Industrial Activity. *(The Board will conduct a public hearing to receive evidence and testimony concerning an ACL Complaint issued to the following permittees. Following the public hearing, the Board may take action to affirm, modify or rescind the ACLs).*
[Bryan Schweickert, 576-6786].....Board Action

12.1 Complaint No. 98-099 against Beneto Inc. Truck Terminal, Long Beach (WDID 4B19SO 01401)
12.2 Complaint No. 98-100 against Harout's Auto, Sun Valley (WDID 4B19SO 04503)
12.3 Complaint No. 98-102 against Hugo Giusto Auto, Maywood (WDID 4B19SO 04928)
12.4 Complaint No. 98-103 against Foothill Foundry, Azusa (WDID 4B19SO 04947)
12.5 Complaint No. 98-106 against Truck Parts Company, Sun Valley (WDID 4B19SO 05937)
12.6 Complaint No. 98-107 against Taylor Desk, Lynwood (WDID 4B19SO 06999)

*13. Rescission of a Cease and Desist Order for Ventura Regional Sanitation District (Nyeland Acres Wastewater Treatment Plant), *Oxnard (After a hearing, the Board will be asked to rescind the Cease and Desist Order.)*
[Veronica Cuevas-Alpuche, 576-6662].....Consent Calendar

OTHER BUSINESS

14. Consideration of a Resolution Authorizing the Executive Officer to Execute the Prospective Purchaser Agreement and Covenant Not to Sue for the SKG Playa, LLC, Studio Land Co., LLC and Playa Capital Company, LLC (The Dream-works Site). *(The Board will be asked to adopt the tentative Resolution).* [John Geroch, 576-6735].....Board Action

15. Consideration of a Resolution Authorizing the Executive Officer to Execute the Prospective Purchaser Agreement and Covenant Not to Sue for the Comstock, Crosser & Associates Development Company, Inc., a California Corporation. *(The Board will be asked to adopt the tentative Resolution).* [David Hung, 576-6723].....Board Action

16. Consideration of Recommended Best Management Practices (BMPs) for Development Planning and Construction for Municipal Storm Water Programs in Los Angeles County. *(The Board will be asked to adopt the tentative Resolution approving the recommended BMPs).*
[Xavier Swamikannu, 576-6654].....Board Action

17. HR Textron Inc., Santa Clarita *(The Board will be asked to (1) adopt a Resolution approving a Negative Declaration and (2) adopt Waste Discharge Requirements for the facility).*
[Rebecca Chou, 576-6733].....Board Action

    17.1 Resolution Approving the Environmental Checklist and Negative Declaration Inc. (Potable Water and Nutrient Injection)

    17.2 Waste Discharge Requirements for HR Textron, Inc. Santa Clarita (Potable Water and Nutrient Injection)

18. Consideration of Resolution Authorizing the Executive Officer to Approve the Recommended Proposition A Projects for Reducing Urban Runoff Pollutant Load in Urban Runoff to Santa Monica Bay. *(The Board will be asked to adopt the tentative Resolution).*
[Marianne Yamaguchi, 576-6614].....Board Action

INFORMATION ITEMS *(Please note that these items are for information only. There will be no voting or formal action taken by the Board on these items.)*

19. Status Report and Briefing of Total Maximum Daily Loads (TMDL). *(Staff will present a summary and time schedule of TMDL activities, and an update on the progress of the Regional Board's TMDL efforts.)* [Jonathan Bishop, 576-6681].....Information/Discussion

20. Status Report on Closure of Azusa Landfill Reclamation (ALR). *(Staff will update the Board on the status of closure operations at the Azusa Landfill).*
[Rodney Nelson, 576-6719].....Information/Discussion

21. Status Report of City of Los Angeles' Hyperion Treatment Plant Consent Decree *(Staff will update the Board on the status of the Consent Decree.)*
[Dennis Dasker, 576-6616].....Information/Discussion

22. Board Member Communications.....Information/Discussion
(The Board Members may discuss communications, correspondence, or other items of general interest relating to matters within the Board's jurisdiction.)

23. Report of Cost Benefit Task Committee.....Information/Discussion
(The Committee will give a progress report.) [Mr. Keston]

24. Executive Officer's Report.....Information/Discussion

25. Closed Session. .....By Board

At any time during the regular session, the Board may adjourn to a closed session to consider litigation, personnel matters, or to deliberate on a decision to be reached based upon evidence introduced in a hearing. Discussion of litigation is within the attorney-client privilege and may be held in closed session. Authority: Government Code Sections 11126(a)(d)(q).

26. Adjournment of current meeting. Next Regular Meeting is Thursday, May 27, at 9:00 a.m., U.S. Court of Appeals Building, 125 S. Grand Avenue, Pasadena.

***

A copy of the complete agenda package is available for examination at the Regional Board Office during regular working hours. Questions about specific items on the agenda should be directed to the staff person whose name is listed with the item.

***

Material presented to the Board as part of testimony that is to be made part of the record must be left with the Board. This includes photographs, slides, charts, diagrams, etc. All Board files pertaining to the items on this Agenda are hereby made a part of the record submitted to the Regional Board by staff for its consideration prior to action on the related items.

*****

Our new web site address is www.swrcb.ca.gov/~rwqcb4. The site can also be accessed through the State Water Resources Control Board's web site at www.swrcb.ca.gov., then clicking on "Interesting Links". Information currently available includes the Regional Board's meeting schedule, a list of the Regional Board members, a list of staff and phone numbers arranged by their work unit,, a copy of the Underground Storage Tank database and information relevant to the UST program, linkage to the Santa Monica Bay Restoration Project's home page, and links to other governmental agencies. If you need further information, please contact Jack Price at 213/576-6669.

****

A listing of pending water quality certification applications currently on public notice pursuant to Section 401 of the Federal Clean Water Act may be obtained by calling Alex Fu at 213/576-6692.

ATTACHMENT 1

Recommended BMPs for Site Planning, Post-Construction, and Redevelopment/Infill

R0072251

Site Planning BMPs
Minimize Storm Water Runoff
Pervious Drainage System
Reduce Area of Impervious Surface
Site Layout

Post-Construction BMPs	
BMP Name	**BMP Identification No. and Name [a]**
Car Wash Facility	SC3, Vehicle and Equipment Washing and Steam Cleaning
Constructed Wetlands	TC3, Constructed Wetlands
Control of Impervious Runoff	Not applicable.
Efficient Irrigation	Not applicable.
Energy Dissipaters	ESC40, Outlet Protection
Extended Detention Basins	TC5, Extended Detention Basin
Infiltration Basins	TC1, Infiltration
Infiltration Trenches	TC1, Infiltration
Inlet Trash Racks	Not applicable.
Landscape Design	ESC2, Preservation of Existing Vegetation; ECS10, Seeding and Planting; ESC11, Mulching
Linings for Urban Runoff Conveyance Channels	Not applicable.
Materials Management	SC5, Outdoor Loading/Unloading of Materials; SC6, Outdoor Container Storage of Liquids; SC8, Outdoor Storage of Raw Materials, Products, and By-Products
Media Filtration	TC6, Media Filtration
Motor Fuel Concrete Dispensing Areas	SC2, Vehicle and Equipment Fueling
Motor Fuel Dispensing Area Canopy	SC2, Vehicle and Equipment Fueling
Oil/Water Separators and Water Quality Inlets	TC7, Oil/Water Separators and Water Quality Inlets
Outdoor Storage	SC6, Outdoor Container Storage of Liquids; SC8, Outdoor Storage of Raw Materials, Products, and By-Products
Porous Pavement and Alternative Surfaces	TC1, Infiltration
Protect Slopes and Channels	ECS40, Outlet Protection; ESC42, Slope Roughening and Terracing
Self-Contained Areas for Vehicle or Equipment Washing, Steam Cleaning, Maintenance, Repair, or Material Processing	SC3, Vehicle and Equipment Washing and Steam Cleaning; SC4, Vehicle and Equipment Maintenance and Repair; SC7, Outdoor Process Equipment Operations and Maintenance
Storm Drain System Stenciling and Signage	SC30, Storm Drain System Signs
Trash Container Areas	SC9, Waste Handling and Disposal
Vegetated Swales and Strips	TC4, Bio-filters
Wet Pond	TC2,Wet Pond

[a] Corresponds to the BMP number and name as in the *California Storm Water Best Management Practice Handbooks* (1993).

ATTACHMENT 2

Recommended Best Management Practices

for

Development Construction

R0072253

Attachment 2

STORMWATER POLLUTION CONTROLS FOR CONSTRUCTION ACTIVITIES

Stormwater Best Management Practices	BMP No. [1]	Categories of Activities																						
		Site Preparation/ Earthmoving		Construction of Underground Structures				Construction of Above Ground Structures				Construction of Roadways, Walkways & Parking Lots			Waterways					Planting & Landscaping			
		Cleaning & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvement	Water & Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
General Site Management																								
Construction Practices																								
Dewatering Operations	CA01		X	X	X	X	X								X	X	X	X	X					
Paving Operations	CA02											X	X	X	X		X	X						
Structure Construction & Painting	CA03			X			X	X	X	X	X				X		X	X						
Vehicle & Equipment Management																	X	X	X					
Vehicle & Equipment Cleaning	CA30	X	X	X	X	X	X																	
Vehicle & Equipment Fueling	CA31	X	X	X	X	X	X					X	X	X					X					
Vehicle & Equipment Maintenance	CA32	X	X	X	X	X	X					X	X	X					X					
Contractor Training												X	X	X					X					
Employee/Subcontractor Training	CA40	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Construction Materials & Waste Management [2]																								
Material Management																								
Material Delivery & Storage	CA10			X	X			X	X	X	X	X	X	X	X		X	X	X		X	X	X	
Material Use	CA11			X	X			X	X	X	X	X	X	X	X		X	X	X		X	X	X	
Spill Prevention & Control	CA12									X	X		X											
Waste Management																								
Solid Waste Management	CA20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hazardous Waste Management	CA21									X	X	X	X											
Contaminated Soil Management	CA22	X	X	X	X	X	X								X	X								
Concrete Waste Management	CA23			X	X		X			X		X			X		X	X		X				
Sanitary/Septic Waste Management	CA24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

(1) Numbers refer to California Best Management Practices Handbook (See Appendix H)
(2) Some practices are also covered under other regulatory programs. See BMP fact sheets in Appendix H for details

16 - 8

R0072254

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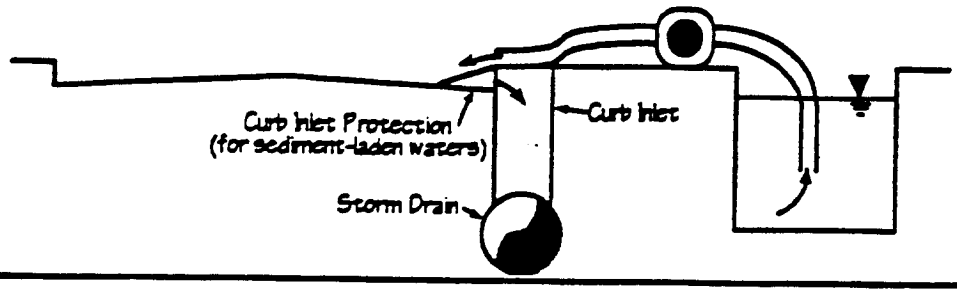
ATTACHMENT 3

BMP Fact Sheets

R0072255

ACTIVITY: DEWATERING OPERATIONS



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from dewatering operations by using sediment controls and by testing the groundwater for pollution.

APPROACH

There are two general classes of pollutants that may result from dewatering operations; sediment, and toxics and petroleum products. A high sediment content in dewatering discharges is common because of the nature of the operation. On the other hand, toxics and petroleum products are not commonly found in dewatering discharges unless, the site or surrounding area has been used for light or heavy industrial activities, or the area has a history of groundwater contamination. The following steps will help reduce storm water pollution from dewatering discharges:

Sediment

- Use sediment controls to remove sediment from water generated by dewatering (See Sediment Trap (ESC 55) and Sediment Basin (ESC 56) in Chapter 5).
- Use filtration to remove sediment from a sediment trap or basin. Filtration can be achieved with:
  - Sump pit and a perforated or slit standpipe with holes and wrapped in filter fabric. The standpipe is surrounded by stones which filters the water as it collects in the pit before being pumped out. Wrapping the standpipe in filter fabric may require an increased suction inlet area to avoid clogging and unacceptable pump operation.
  - Floating suction hose to allow cleaner surface water to be pumped out.

Toxics and Petroleum Products

- In areas suspected of having groundwater pollution, sample the groundwater near the excavation site and have the water tested for known or suspected pollutants at a certified laboratory. Check with the Regional Water Quality Control Board and the local wastewater treatment plant for their requirements for dewatering, additional water quality tests, and disposal options.
- With a permit from the Regional Water Quality Control Board, you may be able to recycle/reuse pumped groundwater for landscape irrigation, or discharge to the storm sewer. With a permit from the local agency, you may be able to treat pumped groundwater and discharge it to the municipal wastewater treatment plant via the sanitary sewer.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ◒ O&M Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA1

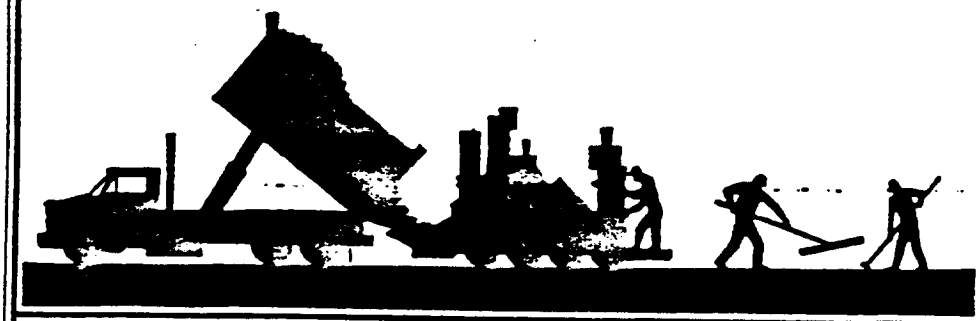
Best Management Practices

16 - 12

R0072256

ACTIVITY: PAVING OPERATIONS

Graphic: North Central Texas COG, 1993



DESCRIPTION

Prevent or reduce the discharge of pollutants from paving operations, using measures to prevent runon and runoff pollution, properly disposing of wastes, and training employees and subcontractors.

APPROACH

- Avoid paving during wet weather.
- Store materials away from drainage courses to prevent storm water runon (see CA10 Material Delivery and Storage).
- Protect drainage courses, particularly in areas with a grade, by employing BMPs to divert runoff or trap/filter sediment (see Chapter 5).
- Leaks and spills from paving equipment can contain toxic levels of heavy metals and oil and grease. Place drip pans or absorbent materials under paving equipment when not in use. Clean up spills with absorbent materials rather than burying. See CA32 (Vehicle and Equipment Maintenance) and CA12 (Spill Prevention and Control) in this chapter.
- Cover catch basins and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- Shovel or vacuum saw-cut slurry and remove from site. Cover or barricade storm drains during saw cutting to contain slurry.
- If paving involves portland cement concrete, see CA23 (Concrete Waste Management) in this chapter.
- If paving involves asphaltic concrete, follow these steps:
  - Do not allow sand or gravel placed over new asphalt to wash into storm drains, streets, or creeks by sweeping. Properly dispose of this waste by referring to CA20 (Solid Waste Management) in this chapter.
  - Old asphalt must be disposed of properly. Collect and remove all broken asphalt from the site and recycle whenever possible.
  - If paving involves on-site mixing plant, follow the storm water permitting requirements for industrial activities.
- Train employees and subcontractors.

REQUIREMENTS

- Costs (Capital, O&M)
  - All of the above are low cost measures.
- Maintenance
  - Inspect employees and subcontractors to ensure that measures are being followed.
  - Keep ample supplies of drip pans or absorbent materials on-site.

LIMITATIONS

- There are no major limitations to this best management practice.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ◒ Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

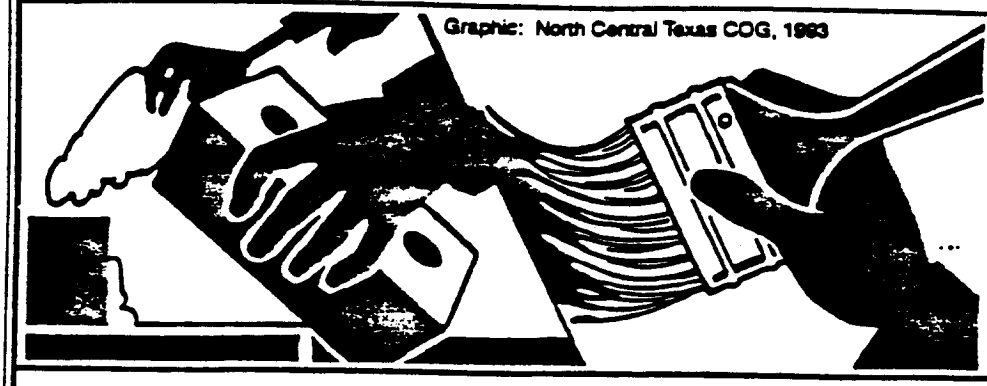
- ○ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA2

Best Management Practices

ACTIVITY: STRUCTURE CONSTRUCTION AND PAINTING


Graphic: North Central Texas COG, 1993

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from structure construction and painting by enclosing or covering or berming building material storage areas, using good housekeeping practices, using safer alternative products, and training employees and subcontractors.

APPROACH

- Keep the work site clean and orderly. Remove debris in a timely fashion. Sweep the area.
- Use soil erosion control techniques if bare ground is exposed (See Chapter 5).
- Buy recycled or less hazardous products to the maximum extent practicable.
- Conduct painting operations consistent with local air quality and OSHA regulations.
- Properly store paints and solvents. See CA10 (Material Delivery and Storage) in this chapter.
- Properly store and dispose waste materials generated from the activity. See the waste management BMPs (CA20 to CA24) in this chapter.
- Recycle residual paints, solvents, lumber, and other materials to the maximum extent practicable.
- Make sure that nearby storm drains are well marked to minimize the chance of inadvertent disposal of residual paints and other liquids.
- Clean the storm drain system in the immediate construction area after construction is completed.
- Educate employees who are doing the work.
- Inform subcontractors of company policy on these matters and include appropriate provisions in their contract to make certain proper housekeeping and disposal practices are implemented.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
  - These BMPs are generally of low to moderate cost.
- Maintenance
  - Maintenance should be minimal.

LIMITATIONS

- Safer alternative products may not be available, suitable, or effective in every case.
- Hazardous waste that cannot be re-used or recycled must be disposed of by a licensed hazardous waste hauler.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ○ Oil & Grease
- ● Floatable Materials
- ● Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

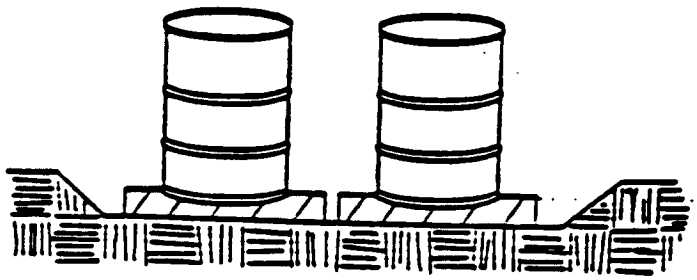
- ○ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA3

Best Management Practices

ACTIVITY: MATERIAL DELIVERY AND STORAGE



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from material delivery and storage by minimizing the storage of hazardous materials on-site, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors.

This best management practice covers only material delivery and storage. For other information on materials, see CA11 (Material Use), or CA12 (Spill Prevention and Control). For information on wastes, see the waste management BMPs in this chapter.

APPROACH

The following materials are commonly stored on construction sites:

- Soil,
- Pesticides and herbicides,
- Fertilizers,
- Detergents,
- Plaster or other products,
- Petroleum products such as fuel, oil, and grease, and
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

Storage of these materials on-site can pose the following risks:

- Storm water pollution,
- Injury to workers or visitors,
- Groundwater pollution, and
- Soil contamination.

Therefore, the following steps should be taken to minimize your risk:

- Designate areas of the construction site for material delivery and storage.
  - Place near the construction entrances, away from waterways
  - Avoid transport near drainage paths or waterways
  - Surround with earth berms (see ESC30, Earth Dike.)
  - Place in an area which will be paved
- Storage of reactive, ignitable, or flammable liquids must comply with the fire codes of your area. Contact the local Fire Marshal to review site materials, quantities, and proposed storage area to determine specific requirements. See the Flammable and Combustible Liquid Code, NFPA30.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.
- Keep an accurate, up-to-date inventory of materials delivered and stored on-site.
- Keep your inventory down.

Targeted Pollutants

- ◒ Sediment
- ◒ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA10

Best Management Practices

ACTIVITY: MATERIAL USE

Graphic: North Central Texas COG, 1993



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from material use by using alternative products, minimizing hazardous material use on-site, and training employees and subcontractors.

APPROACH

The following materials are commonly used on construction sites:

- Pesticides and herbicides,
- Fertilizers,
- Detergents,
- Plaster and other products,
- Petroleum products such as fuel, oil, and grease, and
- Other hazardous chemicals such as acids, lime, glues, paints, solvents, and curing compounds.

Use of these materials on-site can pose the following risks:

- Storm water pollution,
- Injury to workers or visitors,
- Groundwater pollution, and
- Soil contamination.

Therefore, the following steps should be taken to minimize your risk:

- Use less hazardous, alternative materials as much as possible.
- Minimize use of hazardous materials on-site.
- Use materials only where and when needed to complete the construction activity.
- Follow manufacturer's instructions regarding uses, protective equipment, ventilation, flammability, and mixing of chemicals.
- Personnel who use pesticides should be trained in their use. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct on-site inspections.
- Do not over-apply fertilizers, herbicides, and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Unless on steep slopes, till fertilizers into the soil rather than hydroseeding. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains.
- Train employees and subcontractors in proper material use.

Targeted Pollutants

- ○ Sediment
- ◒ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

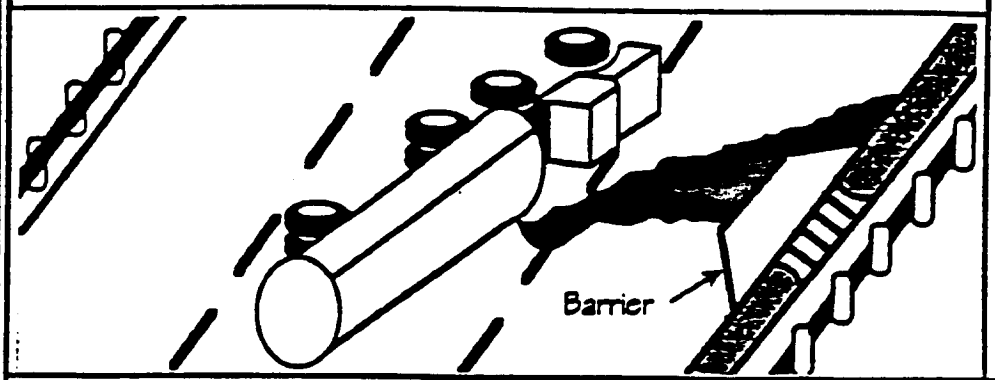
- ○ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA11

Best Management Practices

ACTIVITY: SPILL PREVENTION AND CONTROL



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from leaks and spills by reducing the chance for spills, stopping the source of spills, containing and cleaning up spills, properly disposing of spill materials, and training employees.

This best management practice covers only spill prevention and control. However, CA10 (Material Delivery and Storage) and CA11 (Material Use), also contain useful information, particularly on spill prevention. For information on wastes, see the waste management BMPs in this chapter.

APPROACH

The following steps will help reduce the storm water impacts of leaks and spills:

Define "Significant Spill"

- Different materials pollute in different amounts. Make sure that each employee knows what a "significant spill" is for each material they use, and what is the appropriate response for "significant" and "insignificant" spills.

General Measures

- Hazardous materials and wastes should be stored in covered containers and protected from vandalism.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Train employees in spill prevention and cleanup.
- Designate responsible individuals.

Cleanup

- Clean up leaks and spills immediately.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.
- Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly. See the waste management BMPs in this chapter for specific information.

Reporting

- Report significant spills to local agencies, such as the Fire Department; they can assist in cleanup.
- Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ◒ O&M Costs
- ○ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

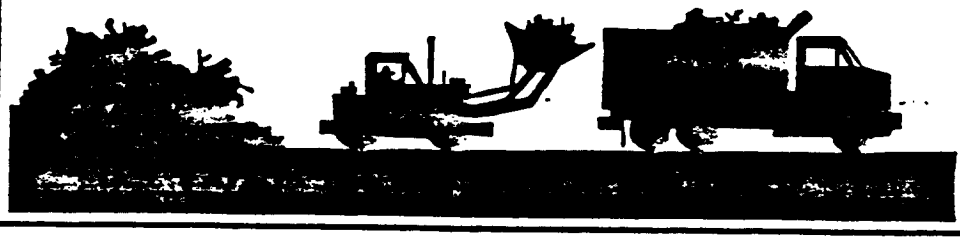
● High ○ Low

CA12

Best Management Practices

ACTIVITY: SOLID WASTE MANAGEMENT

Graphic: North Central Texas COG, 1993



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from solid or construction waste by providing designated waste collection areas and containers, arranging for regular disposal, and training employees and subcontractors.

APPROACH

Solid waste is one of the major pollutants resulting from construction. Construction debris includes:

- Solid waste generated from trees and shrubs removed during land clearing, demolition of existing structures (rubble), and building construction;
- Packaging materials including wood, paper and plastic;
- Scrap or surplus building materials including scrap metals, rubber, plastic, glass pieces, and masonry products; and
- Domestic wastes including food containers such as beverage cans, coffee cups, paper bags, and plastic wrappers, and cigarettes.

The following steps will help keep a clean site and reduce storm water pollution:

- Select designated waste collection areas on-site.
- Inform trash hauling contractors that you will accept only water-tight dumpsters for on-site use. Inspect dumpsters for leaks and repair any dumpster that is not water tight.
- Locate containers in a covered area and/or in a secondary containment.
- Provide an adequate number of containers with lids or covers that can be placed over the container to keep rain out or to prevent loss of wastes when it's windy.
- Plan for additional containers and more frequent pickup during the demolition phase of construction.
- Collect site trash daily, especially during rainy and windy conditions.
- Erosion and sediment control devices tend to collect litter. Remove this solid waste promptly.
- Make sure that toxic liquid wastes (used oils, solvents, and paints) and chemicals (acids, pesticides, additives, curing compounds) are not disposed of in dumpsters designated for construction debris.
- Salvage or recycle any useful material. For example, trees and shrubs from land clearing can be used as a brush barrier (see ESC53), or converted into wood chips, then used as mulch on graded areas (see ESC11).
- Do not hose out dumpsters on the construction site. Leave dumpster cleaning to trash hauling contractor.
- Arrange for regular waste collection before containers overflow.

Objectives

- Housekeeping Practices
- **Contain Waste**
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ◒ Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ● Floatable Materials
- ● Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

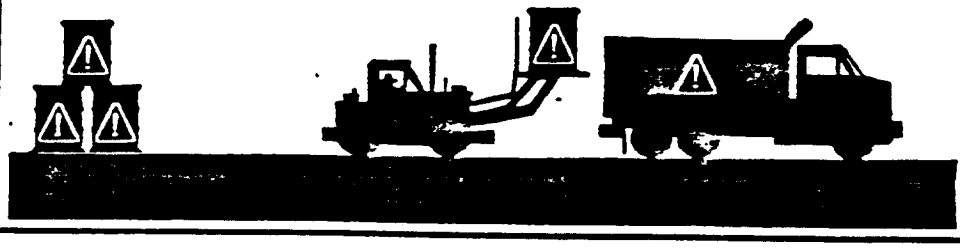
● High ○ Low

CA20

Best Management Practices

ACTIVITY: HAZARDOUS WASTE MANAGEMENT

Graphic: North Central Texas COG, 1993



Objectives

- Housekeeping Practices
- **Contain Waste**
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from hazardous waste through proper material use, waste disposal, and training of employees and subcontractors.

APPROACH

Many of the chemicals used on-site can be hazardous materials which become hazardous waste upon disposal. These wastes may include:

- Paints and solvents;
- Petroleum products such as oils, fuels, and grease;
- Herbicides and pesticides;
- Acids for cleaning masonry; and
- Concrete curing compounds.

In addition, sites with existing structures may contain wastes which must be disposed of in accordance with Federal, State, and local regulations. These wastes include:

- Sandblasting grit mixed with lead-, cadmium-, or chromium-based paints;
- Asbestos; and
- PCBs (particularly in older transformers).

The following steps will help reduce storm water pollution from hazardous wastes:

Material Use

- Use all of the product before disposing of the container.
- Do not remove the original product label, it contains important safety and disposal information.
- Do not over-apply herbicides and pesticides. Prepare only the amount needed. Follow the recommended usage instructions. Over-application is expensive and environmentally harmful. Apply surface dressings in several smaller applications, as opposed to one large application, to allow time for infiltration and to avoid excess material being carried off-site by runoff. Do not apply these chemicals just before it rains. People applying pesticides must be certified in accordance with Federal and State regulations.
- Do not clean out brushes or rinse paint containers into the dirt, street, gutter, storm drain, or stream. "Paint out" brushes as much as possible. Rinse water-based paints to the sanitary sewer. Filter and re-use thinners and solvents. Dispose of excess oil-based paints and sludge as hazardous waste.

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

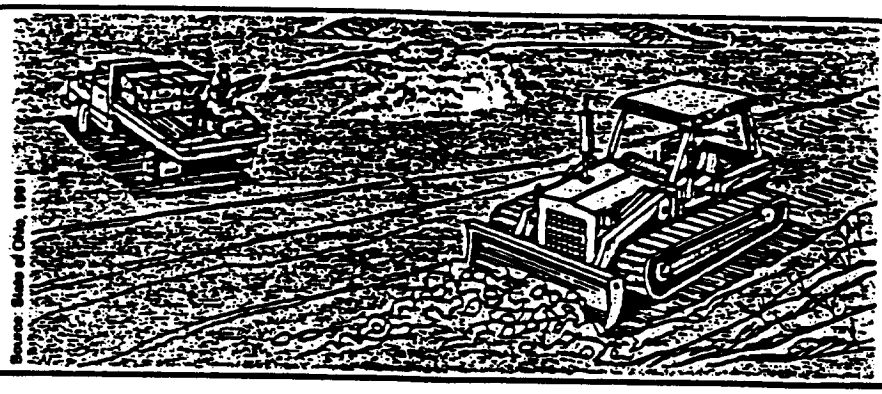
- ○ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA21

Best Management Practices

ACTIVITY: CONTAMINATED SOIL MANAGEMENT



Objectives

- Housekeeping Practices
- **Contain Waste**
- **Minimize Disturbed Areas**
- **Stabilize Disturbed Areas**
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from contaminated soil and highly acidic or alkaline soils by conducting pre-construction surveys, inspecting excavations regularly, and remediating contaminated soil promptly.

APPROACH

Contaminated soils may occur on your site for several reasons including:

- Past site uses and activities;
- Detected or undetected spills and leaks; and
- Acid or alkaline solutions from exposed soil or rock formations high in acid or alkaline-forming elements.

Most developers conduct pre-construction environmental assessments as a matter of routine. Recent court rulings holding contractors liable for cleanup costs when they unknowingly move contaminated soil, highlight the need for contractors to confirm that a site assessment is completed before earth moving begins.

The following steps will help reduce storm water pollution from contaminated soil:

- Conduct thorough site planning including pre-construction geologic surveys.
- Look for contaminated soil as evidenced by discoloration, odors, differences in soil properties, abandoned underground tanks or pipes, or buried debris.
- Prevent leaks and spills to the maximum extent practicable. Contaminated soil can be expensive to treat and/or dispose of properly. However, addressing the problem before construction is much less expensive than after the structures are in place.
- Test suspected soils at a certified laboratory.
- If the soil is contaminated, work with the local regulatory agencies to develop options for treatment and/or disposal.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
  - Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil can be quite expensive.
- Maintenance
  - Inspect excavated areas daily for signs of contaminated soil.
  - Implement CA12, Spill Prevention and Control, to prevent leaks and spills as much as possible.

Targeted Pollutants

- ◒ Sediment
- ○ Nutrients
- ● Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

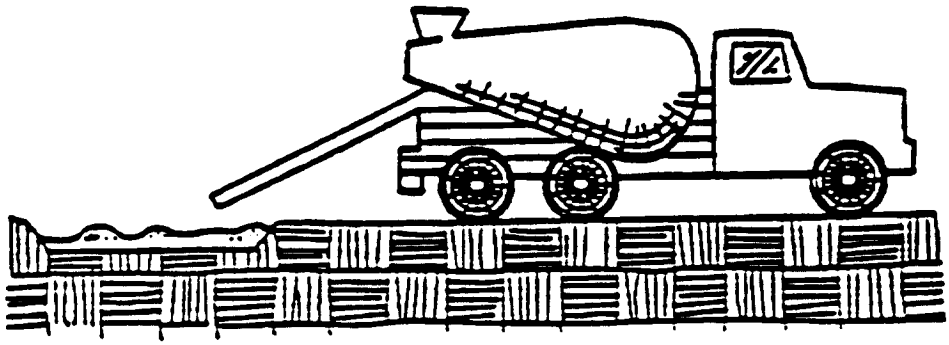
- ○ Capital Costs
- ◒ O&M Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA22

Best Management Practices

ACTIVITY: CONCRETE WASTE MANAGEMENT



Objectives

Housekeeping Practices

Contain Waste

Minimize Disturbed Areas

Stabilize Disturbed Areas

Protect Slopes/Channels

Control Site Perimeter

Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from concrete waste by conducting washout off-site, performing on-site washout in a designated area, and training employees and subcontractors.

APPROACH

The following steps will help reduce storm water pollution from concrete wastes:

- Store dry and wet materials under cover, away from drainage areas.
- Avoid mixing excess amounts of fresh concrete or cement on-site.
- Perform washout of concrete trucks off site or in designated areas only.
- Do not wash out concrete trucks into storm drains, open ditches, streets, or streams.
- Do not allow excess concrete to be dumped on-site, except in designated areas.
- For on-site washout:
  - locate washout area at least 50 feet from storm drains, open ditches, or water bodies. Do not allow runoff from this area by constructing a temporary pit or bermed area large enough for liquid and solid waste;
  - wash out wastes into the temporary pit where the concrete can set, be broken up, and then disposed of properly.
- When washing concrete to remove fine particles and expose the aggregate, avoid creating runoff by draining the water to a bermed or level area.
- Do not wash sweepings from exposed aggregate concrete into the street or storm drain. Collect and return sweepings to aggregate base stock pile, or dispose in the trash.
- Train employees and subcontractors in proper concrete waste management.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
  - All of the above are low cost measures.
- Maintenance
  - Inspect subcontractors to ensure that concrete wastes are being properly managed.
  - If using a temporary pit, dispose hardened concrete on a regular basis.

LIMITATIONS

- Off-site washout of concrete wastes may not always be possible.

Targeted Pollutants

- ○ *Sediment*
- ○ *Nutrients*
- ○ *Toxic Materials*
- ○ *Oil & Grease*
- ○ *Floatable Materials*
- ◒ *Other Construction Waste*

- ● *Likely to Have Significant Impact*
- ○ *Probable Low or Unknown Impact*

Implementation Requirements

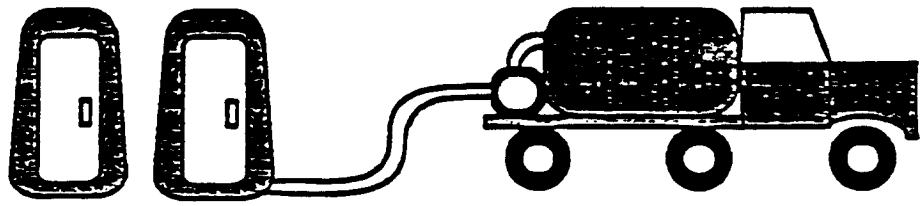
- ○ *Capital Costs*
- ○ *O&M Costs*
- ◒ *Maintenance*
- ◒ *Training*
- ○ *Suitability for Slopes >5%*

● *High* ○ *Low*

CA23

Best Management Practices

ACTIVITY: SANITARY/SEPTIC WASTE MANAGEMENT



Objectives

- Housekeeping Practices
- **Contain Waste**
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from sanitary/septic waste by providing convenient, well-maintained facilities, and arranging for regular service and disposal.

APPROACH

Sanitary or septic wastes should be treated or disposed of in accordance with State and local requirements. These requirements may include:

- Locate sanitary facilities in a convenient location.
- Untreated raw wastewater should never be discharged or buried.
- Temporary septic systems should treat wastes to appropriate levels before discharging.
- If using an on-site disposal system (OSDS), such as a septic system, comply with local health agency requirements.
- Temporary sanitary facilities that discharge to the sanitary sewer system should be properly connected to avoid illicit discharges.
- If discharging to the sanitary sewer, contact the local wastewater treatment plant for their requirements.
- Sanitary/septic facilities should be maintained in good working order by a licensed service.
- Arrange for regular waste collection by a licensed hauler before facilities overflow.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
  - All of the above are low cost measures.
- Maintenance
  - Inspect facilities regularly.
  - Arrange for regular waste collection.

LIMITATIONS

- There are no major limitations to this best management practice.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites; Flood Control District of Maricopa County, AZ, September 1992.

Storm Water Management for Construction Activities, Developing Pollution Prevention Plans and Best Management Practices, EPA 832-R-92005; USEPA, April 1992.

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ◒ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA24

Best Management Practices

ACTIVITY: VEHICLE AND EQUIPMENT CLEANING

Graphic: North Central Texas COG, 1993



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment cleaning by using off-site facilities, washing in designated, contained areas only, eliminating discharges to the storm drain by infiltrating or recycling the wash water, and/or training employees and subcontractors.

APPROACH

- Use off-site commercial washing businesses as much as possible. Washing vehicles and equipment outdoors or in areas where wash water flows onto paved surfaces or into drainage pathways can pollute storm water. If you wash a large number of vehicles or pieces of equipment, consider conducting this work at an off-site commercial business. These businesses are better equipped to handle and dispose of the wash waters properly. Performing this work off-site can also be economical by eliminating the need for a separate washing operation at your site.
- If washing must occur on-site, use designated, bermed wash areas to prevent wash water contact with storm water, creeks, rivers, and other water bodies. The wash area can be sloped for wash water collection and subsequent infiltration into the ground.
- Use as little water as possible to avoid having to install erosion and sediment controls for the wash area.
- Use phosphate-free, biodegradable soaps.
- Educate employees and subcontractors on pollution prevention measures.
- Do not permit steam cleaning on-site. Steam cleaning can generate significant pollutant concentrations.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
  - All of the above are low cost measures.
- Maintenance
  - Minimal, some berm repair may be necessary.

LIMITATIONS

- Even phosphate-free, biodegradable soaps have been shown to be toxic to fish before the soap degrades.
- Sending vehicles/equipment off-site should be done in conjunction with ESC24 (Stabilized Construction Entrance).

REFERENCE

Swisher, R.D., 1987. Surfactant Biodegradation, Marcel Decker Corporation

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

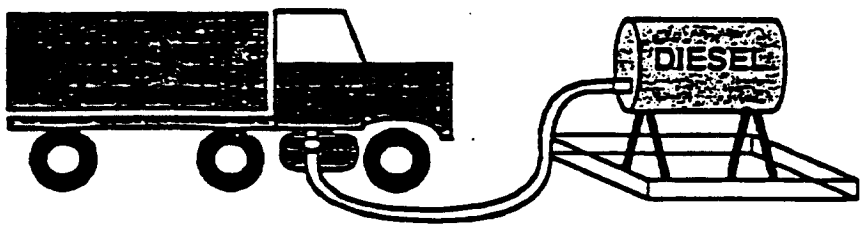
- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA30

Best Management Practices

ACTIVITY: VEHICLE AND EQUIPMENT FUELING



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

DESCRIPTION

Prevent fuel spills and leaks, and reduce their impacts to storm water by using off-site facilities, fueling in designated areas only, enclosing or covering stored fuel, implementing spill controls, and training employees and subcontractors.

APPROACH

- Use off-site fueling stations as much as possible. Fueling vehicles and equipment outdoors or in areas where fuel may spill/leak onto paved surfaces or into drainage pathways can pollute storm water. If you fuel a large number of vehicles or pieces of equipment, consider using an off-site fueling station. These businesses are better equipped to handle fuel and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate fueling area at your site.
- If fueling must occur on-site, use designated areas, located away from drainage courses, to prevent the runon of storm water and the runoff of spills.
- Discourage "topping-off" of fuel tanks.
- Always use secondary containment, such as a drain pan or drop cloth, when fueling to catch spills/leaks.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Carry out all Federal and State requirements regarding stationary above ground storage tanks.
- Avoid mobile fueling of mobile construction equipment around the site; rather, transport the equipment to designated fueling areas. With the exception of tracked equipment such as bulldozers and perhaps forklifts, most vehicles should be able to travel to a designated area with little lost time.
- Train employees and subcontractors in proper fueling and cleanup procedures.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
  - All of the above measures are low cost, except for the capital costs of above ground tanks that meet all local environmental, zoning, and fire codes.
- Maintenance
  - Keep ample supplies of spill cleanup materials on-site.
  - Inspect fueling areas and storage tanks on a regular schedule.

LIMITATIONS

- Sending vehicles/equipment off-site should be done in conjunction with ESC24 (Stabilized Construction Entrance).

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

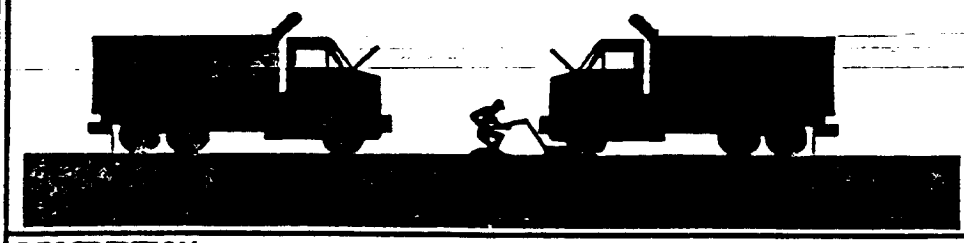
● High ○ Low

CA31

Best Management Practices

ACTIVITY: VEHICLE AND EQUIPMENT MAINTENANCE

Graphic: North Central Texas COG, 1993



DESCRIPTION

Prevent or reduce the discharge of pollutants to storm water from vehicle and equipment maintenance by running a "dry site". This involves using off-site facilities, performing work in designated areas only, providing cover for materials stored outside, checking for leaks and spills, containing and cleaning up spills immediately, and training employees and subcontractors.

APPROACH

- Keep vehicles and equipment clean, don't allow excessive build-up of oil and grease.
- Use off-site repair shops as much as possible. Maintaining vehicles and equipment outdoors or in areas where vehicle or equipment fluids may spill or leak onto the ground can pollute storm water. If you maintain a large number of vehicles or pieces of equipment, consider using an off-site repair shop. These businesses are better equipped to handle vehicle fluids and spills properly. Performing this work off-site can also be economical by eliminating the need for a separate maintenance area.
- If maintenance must occur on-site, use designated areas, located away from drainage courses, to prevent the runon of storm water and the runoff of spills.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Place a stockpile of spill cleanup materials where it will be readily accessible.
- Use adsorbent materials on small spills rather than hosing down or burying the spill. Remove the adsorbent materials promptly and dispose of properly.
- Regularly inspect on-site vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment on-site.
- Segregate and recycle wastes, such as greases, used oil or oil filters, antifreeze, cleaning solutions, automotive batteries, hydraulic, and transmission fluids.
- Train employees and subcontractors in proper maintenance and spill cleanup procedures.
- For a quick reference on disposal alternatives for specific wastes, see Table 4.2, CA40, Employee/Subcontractor Training.

REQUIREMENTS

- Costs (Capital, O&M)
  - All of the above are low cost measures.
- Maintenance
  - Keep ample supplies of spill cleanup materials on-site.
  - Inspect maintenance areas on a regular schedule.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ◒ Training
- ○ Suitability for Slopes >5%

● High ○ Low

CA32

Best Management Practices

ACTIVITY: EMPLOYEE/SUBCONTRACTOR TRAINING (Continue)

- Consider posting the quick reference table around the job site or in the on-site office trailer to reinforce training.
- Train employee/subcontractors in standard operating procedures and spill cleanup techniques described in the fact sheets. Employee/subcontractors trained in spill containment and cleanup should be present during the loading/unloading and handling of materials.
- Personnel who use pesticides should be trained in their use. The California Department of Pesticide Regulation and county agricultural commissioners license pesticide dealers, certify pesticide applicators, and conduct on-site inspections.
- Proper education of off-site contractors is often overlooked. The conscientious efforts of well trained employee/subcontractors can be lost by unknowing off-site contractors, so make sure they are well informed about what they are expected to do on-site.

CA40

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
General Construction and Painting; Street and Utility Maintenance (cont'd)			
Non-hazardous paint scraping/ sand blasting	1. Dry sweep, dispose as trash		1. Dry sweep, dispose as trash
HAZARDOUS paint scraping/sand blasting (e.g. marine paints or paints containing lead or tributyl tin)	1. Dry sweep, dispose as hazardous waste		1. Dry sweep, take to HHW drop-off
Soil from excavations during periods when storms are forecast	1. Should not be placed in street or on paved areas 2. Remove from site or backfill by end of day 3. Cover with tarpaulin or surround with hay bales, or use other runoff controls 4. Place filter mat over storm drain Note: Thoroughly sweep following removal of dirt in all four alternatives.		
Soil from excavations placed on paved surfaces during periods when storms are not forecast	1. Keep material out of storm conveyance systems and thoroughly remove via sweeping following removal of dirt		
Cleaning streets in construction areas	1. Dry sweep and minimize tracking of mud 2. Use silt ponds and/or similar pollutant reduction techniques when flushing pavement		
Soil erosion, sediments	1. Cover disturbed soils, use erosion controls, block entry to storm drain. 2. Seed or plant immediately.		
Fresh cement, grout, mortar	1. Use/reuse excess 2. Dispose to trash		1. Use/reuse excess 2. Dispose as trash
Washwater from concrete/mortar (etc.) cleanup	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer	POTW	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer
Aggregate wash from driveway/patio construction	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer	POTW	1. Wash onto dirt area, spade in 2. Pump and remove to appropriate disposal facility 3. Settle, pump water to sanitary sewer

R0072271

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
General Construction and Painting; Street and Utility Maintenance (cont'd)			
Rinsewater from concrete mixing trucks	1. Return truck to yard for rinsing into pond or dirt area 2. At construction site, wash into pond or dirt area		
Non-hazardous construction and demolition debris	1. Recycle/reuse (concrete, wood, etc.) 2. Dispose as trash		1. Recycle/reuse (concrete, wood, etc. 2. Dispose as trash
Hazardous demolition and construction debris (e.g. asbestos)	1. Dispose as hazardous waste		1. Do not attempt to remove yourself. Contact asbestos removal service for safe removal and disposal 2. Very small amounts (less than 5 lbs) may be double-wrapped in plastic and taken to HHW drop-off
Saw-cut slurry	1. Use dry cutting technique and sweep up residue 2. Vacuum slurry and dispose off-site. 3. Block storm drain or berm with low weir as necessary to allow most solids to settle. Shovel out gutters; dispose residue to dirt area, construction yard or landfill.		
Construction dewatering (Nonturbid, uncontaminated groundwater)	1. Recycle/Reuse 2. Discharge to storm drain		
Construction dewatering (Other than nonturbid, uncontaminated groundwater)	1. Recycle/reuse 2. Discharge to sanitary sewer 3. As appropriate, treat prior to discharge to storm drain	POTW Reg. Bd.	
Portable toilet waste	1. Leasing company shall dispose to sanitary sewer at POTW	POTW	
Leaks from garbage dumpsters	1. Collect, contain leaking material. Eliminate leak, keep covered, return to leasing company for immediate repair 2. If dumpster is used for liquid waste, use plastic liner		

R0072272

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
Landscape/Garden Maintenance			
Pesticides	1. Use up. Rinse containers use rinsewater as product. Dispose rinsed containers as trash 2. Dispose unused pesticide as hazardous waste		1. Use up. Rinse containers, use rinsewater as pesticide. Dispose rinsed container as trash. 2. Take unused pesticide to HHW drop-off
Garden clippings	1. Compost 2. Take to Landfill		1. Compost 2. Dispose as trash.
Tree trimming	1. Chip if necessary, before composting or recycling		1. Chip if necessary, before composting or recycling
Swimming pool, spa, fountain water (emptying)	1. Do not use metal-based algicides (i.e. Copper Sulfate) 2. Recycle/reuse (e.g. irrigation) 3. Determine chlorine residual = 0, wait 24 hours and then discharge to storm drain.	POTW	1. Do not use metal-based algicides (i.e. Copper Sulfate) 2. Recycle/reuse (e.g. irrigation) 3. Determine chlorine residual = 0, wait 24 hours and then discharge to storm drain.
Acid or other pool/spa/fountain cleaning	1. Neutralize and discharge to sanitary sewer	POTW	
Swimming pool, spa filter backwash	1. Reuse for irrigation 2. Dispose on dirt area 3. Settle, dispose to sanitary sewer		1. Use for landscape irrigation 2. Dispose on dirt area 3. Settle, dispose to sanitary sewer
Vehicle Wastes			
Used motor oil	1. Use secondary containment while storing, send to recycler.		1. Put out for curbside recycling pickup where available 2. Take to Recycling Facility or auto service facility with recycling program 3. Take to HHW events accepting motor oil
Antifreeze	1. Use secondary containment while storing, send to recycler.		1. Take to Recycling Facility
Other vehicle fluids and solvents	1. Dispose as hazardous waste		1. Take to HHW event
Automobile batteries	1. Send to auto battery recycler 2. Take to Recycling Center		1. Exchange at retail outlet 2. Take to Recycling Facility or HHW event where batteries are accepted
Motor home/construction trailer waste	1. Use holding tank. Dispose to sanitary sewer		1. Use holding tank, dispose to sanitary sewer.

R0072273

DISCHARGE/ACTIVITY	BUSINESS/COMMERCIAL Disposal Priorities	Approval	RESIDENTIAL Disposal Priorities
Other Wastes (cont'd)			
Kitchen Grease	1. Provide secondary containment, collect, send to recyler. 2. Provide secondary containment, collect, send to POTW via hauler.	POTW	1. Collect, solidify, dispose as trash
Restaurant cleaning of floor mats, exhaust filters, etc.	1. Clean inside building with discharge through grease trap to sanitary sewer. 2. Clean outside in container or bermed area with discharge to sanitary sewer.		
Clean-up wastewater from sewer back-up	1. Follow this procedure: a. Block storm drain, contain, collect, and return spilled material to the sanitary sewer. b. Block storm drain, rinse remaining material to collection point and pump to sanitary sewer. (no rinse-water may flow to storm drain)		

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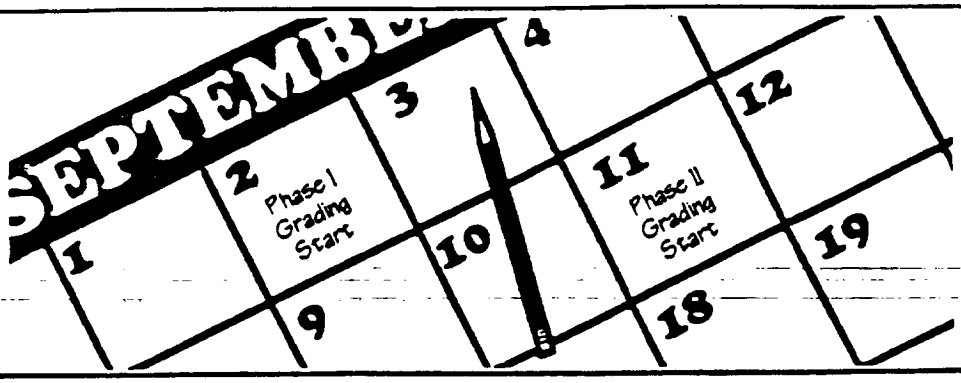
R0072274

BMP: SCHEDULING



DESCRIPTION

Sequencing the construction project to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking.

SUITABLE APPLICATIONS

Proper sequencing of construction activities to reduce erosion potential should be incorporated into the schedule of every construction project. Use of other, more costly yet less effective, erosion and sedimentation controls, may often be reduced through proper construction sequencing.

APPROACH

- Project design considerations: Design project to integrate into existing land contours. Significant regrading of a site will require more costly erosion and sedimentation control measures and may require that on-site drainage facilities be installed.
- Incorporate existing, natural areas: Inventory and evaluate the existing site terrain and vegetation. Disturbance of highly erosive natural areas (e.g., steep, unstable slope areas, watercourses) should be minimized, while protecting other areas may enhance site aesthetics. Construction should not disturb these areas (see ESC2).
- Avoid rainy periods: Schedule major grading operations during dry months. Allow enough time before rainfall begins to stabilize the soil with vegetation or physical means (see ESC 10 to 24) or to install temporary sediment trapping devices (see ESC 50 to 56).
- Practice erosion and sediment control year round: Erosion may be caused during dry seasons by "freak" rainfall, wind and vehicle tracking. Therefore, keep the site stabilized year-round, and retain wet season sediment trapping devices.
- Minimize soil exposed at one time: Schedule projects to disturb only small portions of the site at any one time. Complete grading as soon as possible. Immediately stabilize the disturbed portion before grading the next portion. Practice staged seeding—revegetate cut and fill slopes as the work progresses.
- Trenching: Close and stabilize open trenches as soon as possible. Sequence trenching projects so that most open portions of the trench are closed before new trenching is begun.

REQUIREMENTS

- Cost
  - Construction scheduling to reduce erosion may increase other construction costs due to reduced economies of scale in performing site grading. The cost-effectiveness of scheduling techniques should be compared with the other, less effective erosion and sedimentation controls to achieve a cost-effective balance.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ○ Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

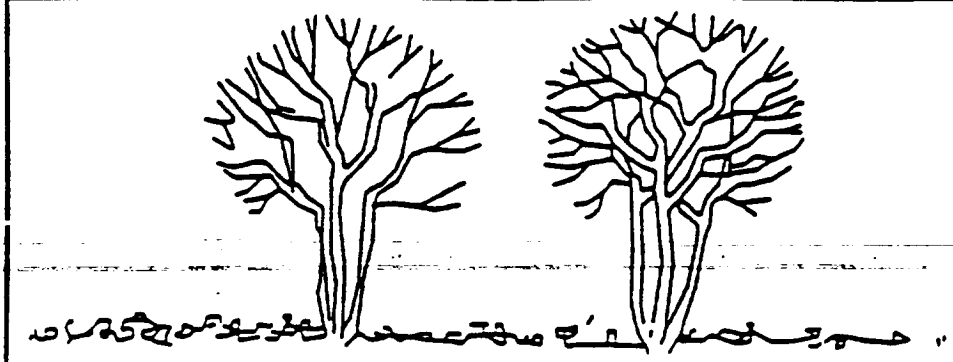
- ○ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ○ Training
- ○ Suitibility for Slopes >5%

● High ○ Low

ESC1

Best Management Practices

BMP: PRESERVATION OF EXISTING VEGETATION



GENERAL DESCRIPTION

Carefully planned preservation of existing vegetation minimizes the potential of removing or injuring existing trees, vines, shrubs and/or grasses that serve as erosion controls.

SUITABLE APPLICATIONS

- Areas within site where no construction activity occurs, or occurs at a later date.
- Sensitive areas where natural vegetation exist and should be preserved, such as: steep slopes, watercourses, and building sites in wooded areas.
- Areas where local, state and federal government requires preservation, such as: vernal pools, wetlands, marshes, certain oak trees, etc.

INSTALLATION/APPLICATION CRITERIA

- Clearly mark, flag or fence vegetation or areas where vegetation should be preserved.
- Prepare landscaping plans which include as much existing vegetation as possible and state proper care of this vegetation both during and after construction.
- Define and protect with berms, fencing, signs, etc., a setback area from vegetation to be preserved. Setback area size should be based on the location, species, size, age and potential impact of adjacent construction activities or permanent improvements.
- Proposed landscaping plans which do not include plant species that compete with the existing vegetation.
- Do not locate construction traffic routes, spoil piles, etc., where significant adverse impact on existing vegetation may occur.

REQUIREMENTS

- Maintenance
  - Inspection and maintenance requirements for protection of vegetation are low.
  - During construction the limits of grading or disturbance should be clearly marked at all times.
  - Irrigation or maintenance of native trees or vegetation should conform to specifications on the Landscape Plan.
- Cost
  - There is little cost associated with preserving existing vegetation if properly planned during the project design, and may yield aesthetic benefits which enhance property values.

LIMITATIONS

- Requires forward planning by the owner/developer, contractor and design staff.
- For sites with diverse topography, it is often difficult and expensive to save existing trees while grading the site satisfactorily for the planned development.

Objectives

- Housekeeping Practices
- Contain Waste
- **Minimize Disturbed Areas**
- **Stabilize Disturbed Areas**
- **Protect Slopes/Channels**
- **Control Site Perimeter**
- Control Internal Erosion

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ○ Training
- ● Suitability for Slopes >5%

● High ○ Low

ESC2

Best Management Practices

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R0072276

Additional Information — Preservation of Existing Vegetation

Methods for protecting existing vegetation and trees:

- Stake off root system limits (drip line of tree). Some counties limit construction within 5 feet of the tree drip line.
- Fence off the area to be preserved or along the tree drip line.
- Flag or mark trees to remain in place.
- Tree wells and retaining walls (permanent) help preserve existing vegetation, but must be large enough to protect the root system (see below).
- For the California Oak tree, no trenching or irrigation should be allowed within the driplines of the tree, since both these activities are detrimental to the preservation of the tree.
- Where grading under trees is necessary, excavation and fill should be limited to 1 foot within the driplines.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

County of Sacramento Tree Preservation Ordinance - September 1981.

Stormwater Management Water for the Puget Sound Basin, Washington State Department of Ecology, The Technical Manual - February 1992, Publication # 91-75.

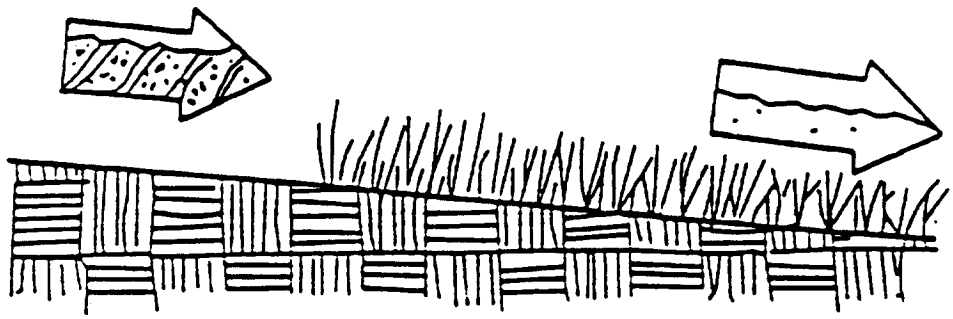
Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency - November 1988.

SUPPLEMENTAL INFORMATION, JUNE 1998

Limit and phase clearing. By clearing only those areas immediately essential for completing site construction, buffer zones are preserved and soil remains undisturbed until construction begins in a particular area. Additionally, the proposed limits of land disturbance should be physically marked off to ensure that no more than the required land area is cleared.

ESC2

BMP: SEEDING AND PLANTING



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- **Stabilize Disturbed Areas** ●
- **Protect Slopes/Channels** ●
- Control Site Perimeter
- Control Internal Erosion

GENERAL DESCRIPTION

Seeding of grasses and plantings of trees, shrubs, vines and ground covers provide long-term stabilization of soil. In some areas, with suitable climates, grasses can be planted for temporary stabilization.

SUITABLE APPLICATIONS

- Appropriate for site stabilization both during construction and post-construction.
- Any graded/cleared areas where construction activities have ceased.
- Open space cut and fill areas.
- Steep slopes.
- Spoil piles.
- Vegetated swales.
- Landscape corridors.
- Stream banks.

INSTALLATION/APPLICATION CRITERIA

Type of vegetation, site and seedbed preparation, planting time, fertilization and water requirements should be considered for each application.

Grasses:

- Ground preparation: fertilize and mechanically stabilize the soil.
- Tolerant of short-term temperature extremes and waterlogged soil conditions.
- Appropriate soil conditions: shallow soil base, good drainage, slope 2:1 or flatter.
- Develop well and quickly from seeds.
- Mowing, irrigating, and fertilizing are vital for promoting vigorous grass growth.

Trees and Shrubs:

- Selection Criteria: vigor, species, size, shape & wildlife food source.
- Soil conditions: select species appropriate for soil,drainage & acidity.
- Other Factors: wind/exposure, temperature extremes, and irrigation needs.

Vines and Ground Covers:

- Ground preparation: lime and fertilizer preparation.
- Use proper seeding rates.
- Appropriate soil conditions: drainage, acidity, slopes.
- Generally avoid species requiring irrigation.

Targeted Pollutants

- ● Sediment
- ◒ Nutrients
- ◒ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ◒ O&M Costs
- ◒ Maintenance
- ◒ Training
- ◒ Suitability for Slopes >5%

● High ○ Low

ESC10

Best Management Practices

16-51

R0072278

Additional Information — Seeding and Planting

Permanent seeding of grasses, sodding, and planting of trees, shrubs, vines and ground covers can provide long-term stabilization of soil. Permanent seeding and planting contributes to long-term site aesthetics and helps reduce erosion by reducing the velocity of runoff, allowing infiltration to occur, filtering sediments, and by holding soil particles in place.

Seeding and planting should be applied as soon as final grading is done to all graded and cleared areas of the construction site where plant cover is ultimately desired. For example, vegetation may be established along landscaped corridors and buffer zones where they may act as filter strips (see TC6 in Chapter 5 of the Municipal Handbook). Additionally, vegetated swales, steep and/or rocky slopes and stream banks can also serve as appropriate areas for seeding and plantings.

Installation/Application Criteria

Application of appropriate vegetation must consider: the seedbed or plantbed, proper seasonal planting times, water requirements fertilizer requirements and availability of the selected vegetation within the project's region. Permanent plantings during the construction stage of projects require careful coordination between the local agency inspectors, project managers, construction managers, and landscape contractor. Protocols for coordination and implementation procedures regarding site access, construction staging, and short- and long-term planting areas should be developed prior to the construction bid process. Where possible, these protocols should be established by and remain the responsibility of the site owner.

Because of the many available types of plants and ground covers and because site conditions and land use vary so widely within California, a set of general guidelines is included for installation/application of grasses, trees and shrubs, vines and ground covers. However, your local municipality, Soil Conservation Service, agricultural extention, or other resources should be consulted on appropriate species, planting requirements, and maintenance needs for your climate and soils.

Grasses

Grasses, depending on the type, provide short-term soil stabilization during construction or can serve as long- term/ permanent soil stabilization for disturbed areas. In general, grasses provide low maintenance to areas that have been cleared, graded and mechanically stabilized.

Selection:

The selection of the grass type is determined by the climate, irrigation, mowing frequency, maintenance effort and soil-bed conditions. Although grasses provide quick germination and rapid growth, they also have a shallow root system and are not as effective in stabilizing deep soils, where trees, shrubs and deep rooted ground covers may be more appropriate. Several grasses are adaptable to the various California climates. The figure at the end of these fact sheets shows appropriate grasses for regions within California. Blue grass is well adapted throughout California except for in the valley regions. The blue grass is found on dry, sandy soils that have good drainage. Bermuda grass, on the other hand is well adapted in the valley region where soils are dry, coarse and heavier. Specific seed mix and/or varieties for each site should be provided by an approved/qualified plant materials specialist.

R0072279

ESC10

Additional Information — Seeding and Planting

Caution should be exercised in the non-native vegetation because of impacts to native vegetation on adjacent lands. For example, species that may be planted at the construction site can quickly spread and compete with originally undisturbed vegetation such as the California Poppy and California buckwheat, both of which complete poorly with introduced grasses (e.g., planting wild oats is illegal in California). In addition to stabilizing disturbed soil, vines and ground covers can perform the following functions:

1. Provide attractive cover that does not need mowing.
2. Help to define traffic areas and control pedestrian movement.

Site Preparation:
Ground covers are plants that naturally grow very close together, causing severe competition for space nutrients and water. Soil for ground covers should be well prepared. The entire area should be spaded, disced, or rototilled to a depth of six to eight inches. Two to three inches of organic material, such as good topsoil or peat, should be spread over the entire area.

Planting:
The following steps will help ensure good plant growth.

1. Make the plantings following the contours of the land.
2. Dig the holes 1/3 larger than the plant root ball.
3. Know what depth to place the plants.
4. Use good topsoil or soil mixture with a lot of organic matter.
5. Fill hole 1/3 to 1/2 full, shake plants to settle soil among roots, then water.
6. Leave saucer-shaped depression around the plant to hold water.
7. Water thoroughly and regularly.
8. Space plants according to the type of plant and the extent of covering desired.

Materials:
There are many different species of vines and ground covers from which to choose, but care must be taken in their selection. It is essential to select planting materials suited to both the intended use and specific site characteristics. The plants discussed in this handbook are those which are known to be adapted to California, and commonly available from commercial nurseries. Additional information can be obtained from local nurserymen, landscape architects, and extension agents. An approved low water use plant list may be obtained from the State Department of Water Resources or the Soils Conservation Service.

Requirements
Maintenance

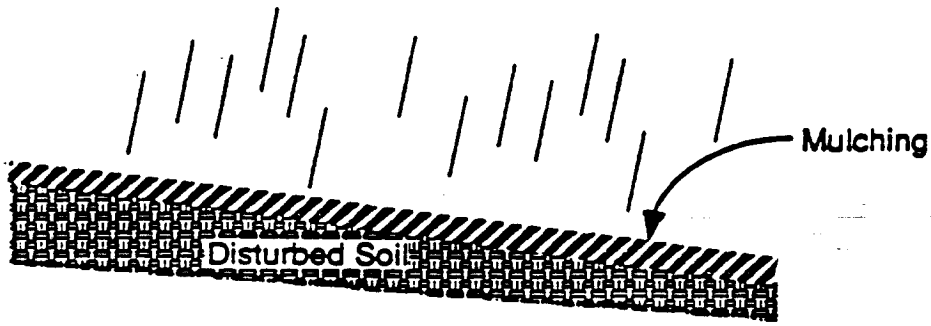
General requirements include:

- Grass maintenance should be minimal to none. Irrigation and regular fertilizing may be required for some types of grasses. Mowing is only required in areas where aesthetics or fire hazards are a concern.
- Young trees should receive an inch of water each week for the first two years after planting. The tree should be watered deeply, but not more often than once per week.
- Transplanted trees should be fertilized on an annual basis.
- Proper pruning, watering, and application of fertilizer is necessary to maintain healthy and vigorous shrubs. A heavy layer of mulch applied around the shrubs reduces weeds and retains moisture.
- Trim old growth as needed to improve the appearance of ground covers. Most covers need once-a-year trimming to promote growth.

ESC10



BMP: MULCHING



GENERAL DESCRIPTION

Mulching is used to temporarily and permanently stabilize cleared or freshly seeded areas. Types of mulches include organic materials, straw, wood chips, bark or other wood fibers, decomposed granite, and gravel.

SUITABLE APPLICATIONS

- Temporary stabilization of freshly seeded and planted areas.
- Temporary stabilization during periods unsuitable for growing vegetation.
- Temporary stabilization of areas that cannot be seeded or planted (e.g., insufficient rain, steep slope).
- Mulches such as gravel and decomposed soils may be used as post-construction BMPs, particularly in arid regions.

INSTALLATION/APPLICATION CRITERIA

Mulch prevents erosion by protecting the soil surface and fostering growth of new seedings that do not stabilize by themselves.

- May be used with netting to supplement soil stabilization.
- Apply to planting areas where slopes are 2:1 or greater.
- Binders may be required for steep areas, or if wind and runoff is a problem.
- Type of mulch, binders, and application rates should be recommended by manufacturer/contractor.

REQUIREMENTS

- Maintenance
  - Must be inspected weekly and after rain for damage or deterioration.
- Cost: Average annual cost for installation and maintenance (3–4 month useful life, source: EPA, 1992)
  - Straw Mulch: $7,500 per acre.
  - Wood Fiber Mulch: $3,500 per acre.
  - Jute Netting: $12,500 per acre.

LIMITATIONS

- Wood fiber mulches should be used only in areas with over 20 inches annual precipitation.
- Organic mulches are not permanent erosion control measures.
- Mulches tend to lower the soil surface temperature, and may delay germination of some seeds.
- Permanent mulches for arid regions should include gravel and decomposed soils.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- **Stabilize Disturbed Areas**
- **Protect Slopes/Channels**
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ● Sediment
- ◒ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ◒ O&M Costs
- ◒ Maintenance
- ○ Training
- ● Suitability for Slopes >5%

R0072281

● High ○ Low

ESC11

Best Management Practices

Additional Information — Mulching

Preparations/Methods and Equipment

Straw Mulch: Should be applied in an even, uniform manner, either by hand or by mulch blowing equipment. Straw mulches must be anchored to prevent the mulch from being blown or washed off the site. Anchoring is achieved in two ways:

- Crimping: The mulch is anchored by running a heavy disc with flat, dull, serrated, closely-spaced blades over the mulched soil. Effective crimping embeds the mulch about 2 inches into the soil without completely covering it. The disc should be run once or twice across the soil. About 2 1/2 tons of straw mulch per acre should be applied if the mulch is anchored by crimping.
- Tacking: Achieved using a emulsified asphalt or binder either independently or followed by crimping. If tacked, straw mulch may be applied at a rate of 1 3/4 ton per acre, and tacked with emulsified asphalt at a rate of 500 gallons per acre.

Wood Fiber Mulch: Typically applied with a hydroseeder at a rate of about 1000 to 1500 pounds per acre, or as a slurry consisting of at least 150 pounds of binder, 400 pounds of wood fiber mulch, and 200 gallons of water per acre.

Requirements

Maintenance: Mulched areas require frequent inspection for damage and deterioration. Requirements will vary greatly based on the type of mulch used and the type of vegetation to be established. Vegetative mulches are usually not intended to be permanent; but are extended only as a base for re-seeding or re-vegetation. Where a permanent anchor for vegetation is required, along steep slopes or areas of higher velocity flows, then a geotextile mat or net is recommended (see ESC20).

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, September 1992.

Controlling Erosion of Construction Sites, U.S. Department of Agriculture, Soil Conservation Service, Agriculture Information # 347.

"Draft - Sedimentation and Erosion Control, An Inventory of Current Practices", U.S.E.P.A., April, 1990.

"Environmental Criteria Manual", City of Austin, Texas.

Guides for Erosion & Sediment Control in California, USDA Soils Conservation Service - January 1991.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, June 1981.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April, 1992.

Soil Erosion by Water, U.S. Department of Agriculture, Soil Conservation District, Agriculture Information Bulletin #513.

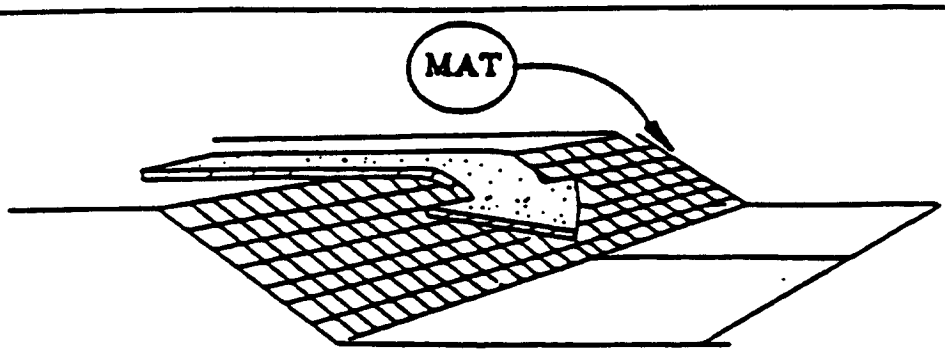
Stormwater Management Water for the Puget Sound Basin, Washington State Department of Ecology, The Technical Manual - February 1992, Publication # 91-75.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency - November 1988.

ESC11

R0072282

BMP: GEOTEXTILES AND MATS



Objectives

- *Housekeeping Practices*
- *Contain Waste*
- *Minimize Disturbed Areas*
- *Stabilize Disturbed Areas* (●)
- *Protect Slopes/Channels* (●)
- *Control Site Perimeter*
- *Control Internal Erosion*

GENERAL DESCRIPTION

Mattings made of natural or synthetic material which are used to temporarily or permanently stabilize soil.

SUITABLE APPLICATIONS

Typically suited for post-construction site stabilization, but may be used for temporary stabilization of highly erosive soils.

- Channels and streams.
- Steep slopes.

INSTALLATION/APPLICATION CRITERIA

Mattings may be applied to disturbed soils and where existing vegetation has been removed. The following organic matting materials provide temporary protection until permanent vegetation is established, or when seasonal circumstances dictate the need for temporary stabilization until weather or construction delays are resolved.

- Jute mattings.
- Straw mattings.

The following synthetic mattings may be used for either temporary or post-construction stabilization, both with and without vegetation

- Excelsior matting.
- Glass fiber matting.
- Staples.
- Mulch nettings.

REQUIREMENTS

- Maintenance
  - Inspect monthly and after significant rainfall.
  - Re-anchor loosened matting and replace missing matting and staples as required.
- Cost
  - Relatively high compared to other BMPs.

LIMITATIONS

- Mattings are more costly than other BMP practices, limiting their use to areas where other BMPs are ineffective (e.g., channels, steep slopes).
- May delay seed germination, due to reduction in soil temperature.
- Installation requires experienced contractor to ensure soil stabilization and erosion protection.

R0072283

Targeted Pollutants

- ● *Sediment*
- ○ *Nutrients*
- ○ *Toxic Materials*
- ○ *Oil & Grease*
- ○ *Floatable Materials*
- ○ *Other Construction Waste*

- ● *Likely to Have Significant Impact*
- ○ *Probable Low or Unknown Impact*

Implementation Requirements

- ● *Capital Costs*
- ◒ *O&M Costs*
- ◒ *Maintenance*
- ○ *Training*
- ● *Suitability for Slopes >5%*

● *High* ○ *Low*

ESC20

Best Management Practices

16 - 60

Additional Information — Geotextiles and Mats

Site Preparation: After the site has been shaped and graded to the approved design, prepare a friable seed bed relatively free from clods and rocks more than 1 inches in diameter and any foreign material that will prevent contact of the protective mat with the soil surface.

Planting: Fertilize and seed in accordance with seeding specifications or other types of landscaping plans. When using jute matting on a seeded area, apply approximately half the seed before laying the mat and the remainder after laying the mat. The protective matting can be laid over areas where grass has been planted and the seedlings have emerged. Where vines or other ground covers are to be planted, lay the protective matting first and then plant through matting according to design of planting.

Erosion Stops: Erosion stops are made of glass fiber strips, excelsior matting strips or tight-folded jute matting blanket or strips for use on steep, highly erodible watercourses. The stops are placed in narrow trenches six to twelve inches deep across the channel and left flush with the soil surface. They are to cover the full cross section of designed flow.

Laying and Securing Matting: Before laying the matting, all erosion stops should be installed and the friable seed bed made free from clods, rocks, and roots. The surface upon which the separation fabric will be placed should be compacted and finished according to the requirements of the manufacturer's recommendations.

Most matting comes with the manufacturer's recommendations for installation. Most channels will require multiple widths of matting, and the matting should be unrolled starting at the upper end of the channel, allowing a four inch overlap of mattings along the center of the channel. To secure, bury the top ends of the matting in a narrow trench, a minimum of six inches deep. Backfill trench and tamp firmly to conform to channel cross section. Secure with a row of staples about four inches down slope from the trench with staples twelve inches apart.

Where matting crosses erosion stops, reinforce with a double row of staples at six inch spacing, using a staggered pattern on either side of the erosion stop. When the matting is overlapped, the discharge end of the matting liner should be similarly secured with a double row of staples.

Mechanical or manual laydown equipment should be capable of handling full rolls of fabric, and laying the fabric smoothly, without wrinkles or folds. The equipment should meet the fabric manufacturer's recommendations or equivalent standards.

Final Check: Check the following after the mating is installed:

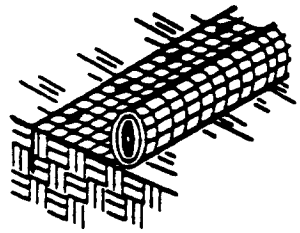
- Make sure matting is uniformly in contact with the soil.
- All lap joints are secure.
- All staples are flush with the ground.
- All disturbed areas seeded.

Limitations

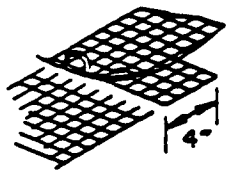
Properly installed mattings provide excellent erosion control but do so at relatively high cost. This high cost typically limits the use of mattings to areas of concentrated channel flow and steep slopes.

Installation is critical and requires experienced contractors. The contractor should install the matting material in such a manner that continuous contact between the material and the soil occurs, otherwise the material will not stabilize the soil and erosion will occur beneath the material. Ultraviolet protection may be required on some geotextiles. Matting strengths and uses vary; the manufacturer's specifications should be followed.

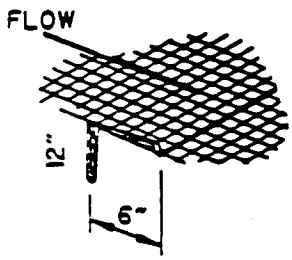
ESC20



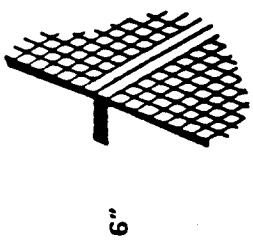
ANCHOR SLOT: BURY THE UP-CHANNEL END OF THE NET IN A 12" DEEP TRENCH. TAMP THE SOIL FIRMLY. STAPLE AT 12" INTERVALS ACROSS THE NET.



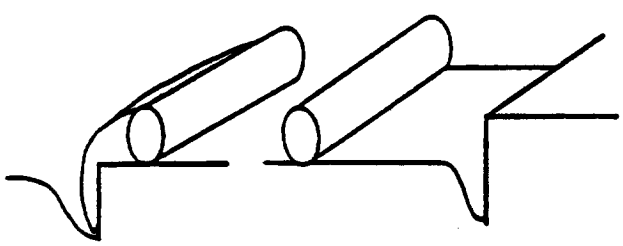
OVERLAP: OVERLAP EDGES OF THE STRIPS AT LEAST 4". STAPLE EVERY 12" DOWN THE CENTER OF THE STRIP.



JOINING STRIPS: INSERT THE NEW ROLL OR NET IN A TRENCH, AS WITH THE ANCHOR SLOT. OVERLAP THE UP-CHANNEL END OF THE PREVIOUS ROLL 18" AND TURN THE END OF THE PREVIOUS ROLL JUST BELOW THE ANCHOR SLOT, LEAVING 6" OVERLAP.



CHECK SLOTS: ON ERODIBLE SOILS OR STEEP SLOPES, CHECK SLOTS SHOULD BE MADE EVERY 15 FEET. INSERT A FOLD OF THE NET INTO A 6" TRENCH AND TRAMP FIRMLY. STAPLE AT 12" INTERVALS ACROSS THE NET. LAY THE NET SMOOTHLY ON THE SURFACE OF THE SOIL - DO NOT STRETCH THE NET, AND DO NOT ALLOW WRINKLES.

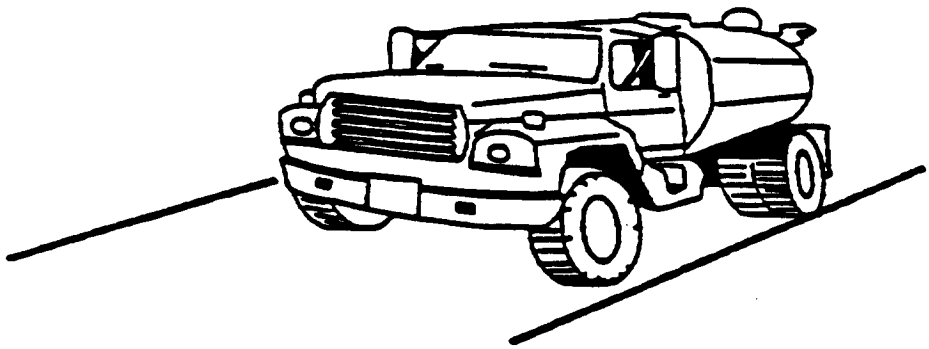


ANCHORING ENDS AT STRUCTURES:
PLACE THE END OF THE NET IN A 12" SLOT ON THE UP-CHANNEL SIDE OF THE STRUCTURE.
FILL THE TRENCH AND TAMP FIRMLY.
ROLL THE NET UP THE CHANNEL.
PLACE STAPLES AT 12" INTERVALS ALONG THE ANCHOR END OF THE NET.

INSTALLATION OF NETTING AND MATTING

ESC20

BMP: DUST CONTROLS



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

GENERAL DESCRIPTION

Dust control measures are used to stabilize soil from wind erosion, and reduce dust generated by construction activities.

SUITABLE APPLICATIONS

- Clearing and grading activities.
- Construction vehicle traffic on unpaved roads.
- Drilling and blasting activities.
- Sediment tracking onto paved roads.
- Soil and debris storage piles.
- Batch drop from front end loaders.
- Areas with unstabilized soil.
- Final grading/site stabilization usually is sufficient to control post-construction dust sources.

INSTALLATION/APPLICATION CRITERIA

- Schedule construction activities to minimize exposed area (See ESC 1).
- Quickly stabilize exposed soils using vegetation, mulching, spray-on adhesives, calcium chloride, sprinkling, and stone/gravel layering (See ESC 10 and 11).
- Identify and stabilize key access points prior to commencement of construction (See ESC 24).
- Minimizing the impact of dust by anticipating the direction of prevailing winds.
- Direct most construction traffic to stabilized roadways within the project site (See ESC 23).

REQUIREMENTS

- Maintenance
  - Most dust control measures require frequent, often daily, attention.
- Cost
  - Installation costs for water/chemical dust suppression are low, but annual costs may be quite high since these measures are effective for only a few hours to a few days.

LIMITATIONS

- Watering prevents dust only for a short period and should be applied daily (or more often) to be effective.
- Overwatering may cause erosion.
- Oil should not be used for dust control because the oil may migrate into drainageway and/or seep into the soil.
- Certain chemically-treated subgrades may make soil water repellant, increasing runoff.

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ◒ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

R0072286

● High ○ Low

ESC21

Best Management Practices

Additional Information — Dust Controls

In addition, there are many other BMPs identified in this handbook that provide dust control including:

- Seeding and Plantings (ESC 10)
- Mulching (ESC 11)
- Construction Road Stabilization (ESC 23)
- Stabilized Construction Entrances (ESC 24)

Limitations

- Oil treated subgrades should not be used because the oil may migrate into drainageways and/or seep into the soil.
- Chemically treated subgrades may make the soil water repellant, interfering with long-term infiltration, and the vegetation/re-vegetation of the site. Some chemical dust suppressants may be subject to freezing and may contain solvents and should be handled properly.
- Asphalt, as a mulch tack or chemical mulch, requires a 24 hour curing time to avoid adherence to equipment, worker shoes, etc. Application should be limited because asphalt surfacing may eventually migrate into the drainage system.
- In compacted areas, watering and other liquid dust control measures may wash sediment or other constituents into the drainage system.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

California Air Pollution Control Laws, California Air Resources Board, 1992.

CalTrans, Standard Specifications, Sections 10, "Dust Control"; Section 17, "Watering"; and Section 18, "Dust Palliative".

Prospects for Attaining the State Ambient Air Quality Standards for Suspended Particulate Matter (PM10), Visibility Reducing Particles, Sulfates, Lead, and Hydrogen Sulfide, California Air Resources Board, April 1991.

Sacramento County, Winterization Ordinance & Dust Control Ordinance (example).

USDA Soil Conservation Service, "Guides for Erosion and Sediment Control".

ESC21

CKE RESTAURANTS
1200 N. HARBOR BLVD. P.O. BOX 4349
ANAHEIM, CALIFORNIA 92803-4349
714-774-5796 • FAX 714-778-7183

April 2, 1999

Xavier Swamikannu
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Xavier:

Thank you for sending the list of recommended Best Management Practices (BMPs) for the Storm Water Program. Attached is the Restaurant Standard Urban Storm Water Mitigation Plan and our comments referencing those BMPs only. I will attend the April 22 hearing for considering these BMPs, and I will provide oral testimony as well.

If you or the Board wish to call me regarding these written comments, you can reach me at 714-778-7150. Thank you for the opportunity to provide the quick service restaurant point of view on this important issue.

Sincerely,

Michael Kissel
Environmental Health Compliance Specialist
CKE Restaurants, Inc.

C: Carl Arena
Suzi Brown
LeRoy Russ
Tom Wilhelm
Robert Wilson
Ron Wennerberg

R0072288

CKE Restaurants, Inc. Comments
for
RESTAURANT
STANDARD URBAN STORM WATER MITIGATION PLAN

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

The installation of a self-contained structure with pretreatment equipment for a sanitary sewer discharge in most free-standing quick service restaurants (QSRs) would have to be incorporated into the outdoor trash enclosure. According to the proposed plan, this would require a roof structure. Since such a structure would significantly increase the cost of new restaurants, it is recommended that each site be given the opportunity for conditional waiver for a cover if that site can demonstrate effective Best Management Practices in keeping the area clean.

2. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Stenciling of storm drain inlets, channels, creeks and catch basins are a responsibility of the municipality or county in unincorporated areas. These areas are outside the jurisdiction of most businesses.

3. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

These structures would, again, apply to QSRs with trash enclosures. Berms and dikes would interfere with the access to the trash containers. A sloped pavement in the enclosure would prevent materials from escaping the area. It is also recommended that a conditional waiver be given to these structures for coverings as well.

4. PROPERLY DESIGN TRASH STORAGE AREAS

See comments for BMPs 1 and 3.

5. CONSIDER ROOFTOP RUNOFF TREATMENT

Since exhaust system cleaning services are the primary contributors of rooftop runoff, they should be required to provide BMPs for mitigation of this problem. With the installation of catalytic converters required by the South Coast AQMD for chain-driven charbroilers, the accumulation of rooftop pollutants form cooking exhaust is no longer an issue.

6. CONTROL PARKING LOT RUNOFF

It is recommended that products claiming to mitigate this runoff be researched and presented to industry. We have not seen a product that can properly filter the volume of water involved in this operation. Infiltration trenches, parking grooves, vegetated swales and landscape islands do not remove the materials from waster steam or they deposit them into the soil impacting the groundwater.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Any documentation of any kind of BMP maintenance should be kept to a minimum. Extensive documentation would be burdensome to QSRs.

RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

GOALS

- Prevent potential pollutants from entering the storm drain system and ultimately impacting receiving waters.
- Reduce amount of runoff.
- Eliminate non-stormwater discharges to the storm drains.

REQUIREMENTS

Developers and/or owners will be required to incorporate Best Management Practices (BMPs) 1 through 7 into project plans and designs. Where the developer and/or owner believes that a BMP is not appropriate or applicable to a specific project, the developer will be required to provide an explanation.

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved and have secondary containment.

2. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating

5. CONSIDER ROOFTOP RUNOFF TREATMENT

Rooftop runoff has the potential to transport toxic compounds, oil and grease, bacteria, and suspended solids. Consideration should be given to implementing the following techniques for treating runoff from individual building rooftops and allowing it to infiltrate into the soil (See Table 1: Suggested Resources for additional sources of information):

- Dry-wells
- Cisterns
- Foundation planting
- Permeable areas near buildings

6. CONTROL PARKING LOT RUNOFF

Parking lots have the potential to contribute oil and grease, trash, heavy metals, and suspended solids to the stormwater conveyance system. Consideration should be given to implementing the following structural BMPs to both reduce the impervious land coverage of parking areas and to filter runoff before it reaches the storm drain system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and landscape islands
- Infiltration trenches
- Oil/Water separators and water quality inlets
- Media filtration
- Bioretention facility
- Hybrid lots
- Parking groves
- Permeable overflow parking

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE ESC 21.2 COMMONLY USED CHEMICALS FOR DUST CONTROL

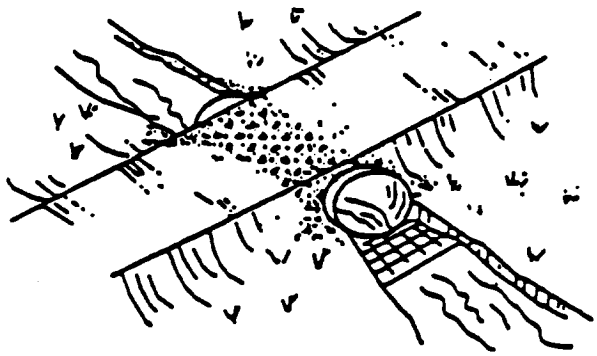
	SALTS	ORGANIC, NON PETROLEUM-BASED	PETROLEUM BASED PRODUCTS[1]
CHEMICAL TYPES	• Calcium Chloride[2] • Magnesium Chloride • Natural Brines	• Calcium Lignosulfonate • Sodium Lignosulfonate • Ammonium Lignosulfonate	• Bunker Oil • Asphalt Primer • Emulsified Asphalt
LIMITATIONS	Can lose effectiveness in dry periods with low humidity. Leaches from road in heavy rain Not recommended for gravel road surfaces with low fines. Recommended 10-20% fines.	Not affected by dry weather and low humidity. Leached from road in heavy rain if not sufficiently cured. Best performance on gravel roads with high surface fines (10-30%) and dense compact surface with loose gravel.	Generally effective regardless of climatic conditions may pothole in wet weather. Best performance on gravel roads with 5-10% fines.
COMMENTS	Calcium Chloride is popular. May become slippery when wet on gravel surfaces with high fines.	Ineffective on gravel surfaces low in fines. May become slippery when wet on gravel surfaces with high fines content.	Creates a hardened crust.

[1] Motor oils and oil treatments are not recommended due to adverse effects on plant life and groundwater.

[2] Not recommended due to adverse effects on plant life.

R0072293

BMP: TEMPORARY STREAM CROSSING



GENERAL DESCRIPTION

A temporary access stream crossing is a temporary culvert, ford or bridge placed across a waterway to provide access for construction purposes for a period of less than one year. Temporary access crossings are not intended to be used to maintain traffic for the general public.

SUITABLE APPLICATIONS

Temporary stream crossings should be installed at all designated crossings of perennial and intermittent streams on the construction site, as well as for dry channels which may be significantly eroded by construction traffic.

INSTALLATION/APPLICATION CRITERIA

Requires knowledge of stream flows and soil strength and should be designed under the direction of a California registered engineer with knowledge of both hydraulics and construction loading requirements for structures.

REQUIREMENTS

- Maintenance
  - Inspect weekly and after each significant rainfall, including assessment of foundations.
  - Periodically remove silt from crossings.
  - Replace lost aggregate from inlets and outlets of culverts.
- Cost
  - CalTrans Construction Cost Index for temporary bridge crossing is $45-$95 per square feet.

LIMITATIONS

- May be an expensive for a temporary improvement.
- Requires other BMPs to minimize soil disturbance during installation and removal.
- Fords should only be used in dry weather.

R0072294

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

● High ○ Low

ESC22

Best Management Practices

Additional Information — Temporary Stream Crossing

- May be expensive temporary cost
- Increased soil disturbance upon installation and removal
- Temporary culverts need regular maintenance and can cause erosion if the culvert becomes clogged.
- A temporary ford offers little if any erosion control in flowing streams and can often make erosion worse. Fords should only be used in the dry season on dry streams.

Construction in waterways is subject to additional permit requirements. Contact the local municipal storm water agency for additional information.

REFERENCES

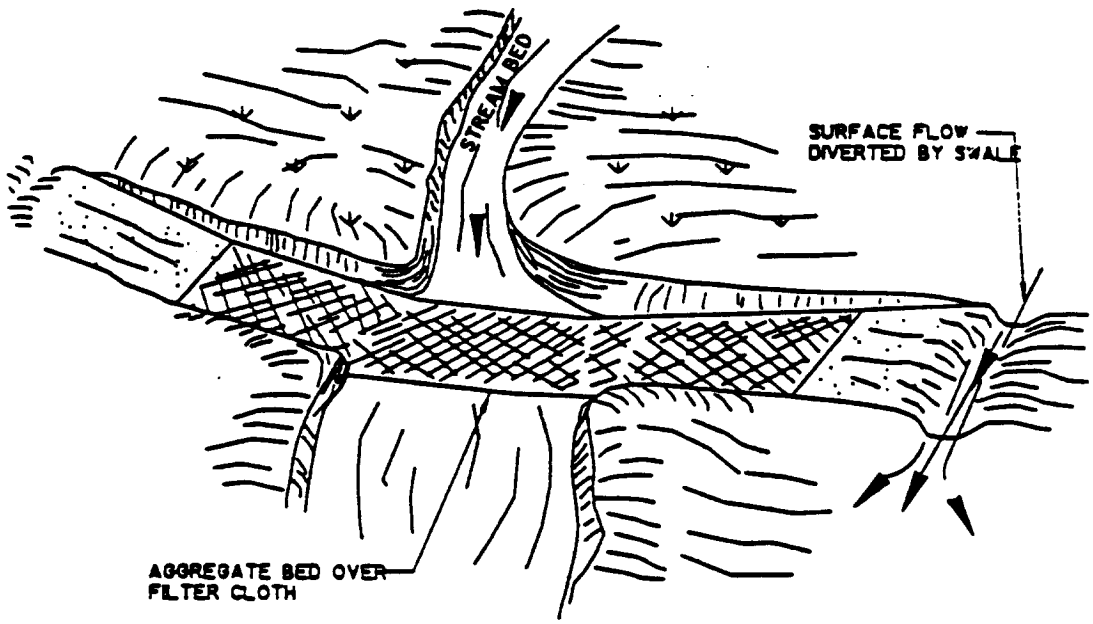
Bank and Shore Protection, CalTrans - November 1970.

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September, 1992.

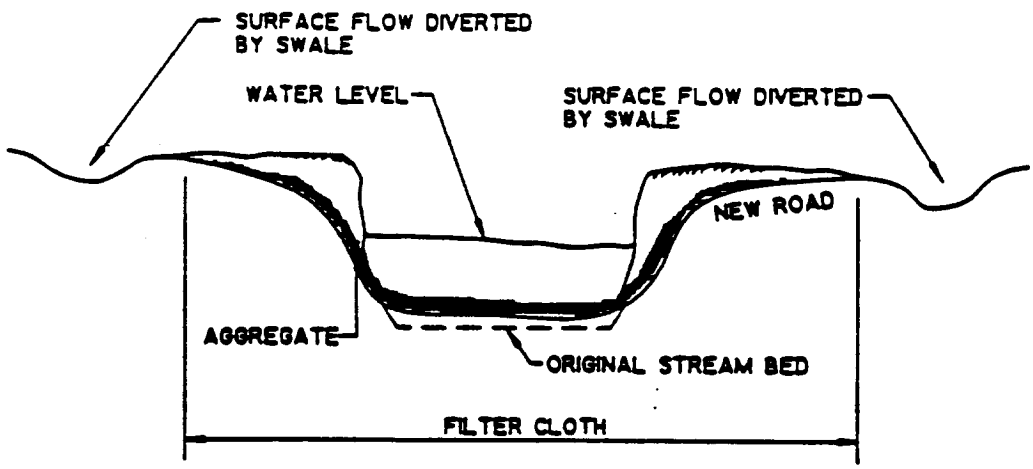
ESC22

R0072295

Additional Information — Temporary Stream Crossing



AGGREGATE APPROACH
5 : 1 MAXIMUM SLOPE ON ROAD

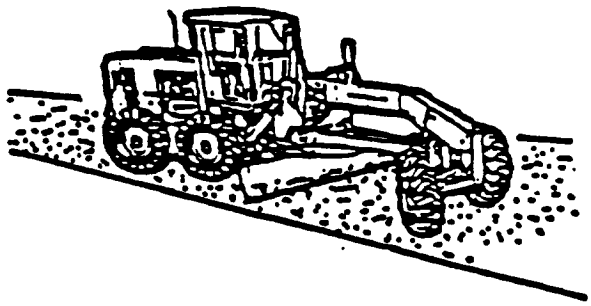


TEMPORARY ACCESS FORD

ESC22

R0072296

BMP: CONSTRUCTION ROAD STABILIZATION



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

GENERAL DESCRIPTION

Access roads, subdivision roads, parking areas, and other on-site vehicle transportation routes should be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.

SUITABLE APPLICATIONS

- Temporary construction traffic.
- Phased construction projects and off-site road access.
- Detour roads.
- Construction during wet weather.

INSTALLATION/APPLICATION CRITERIA

- Road should follow topographic contours to reduce erosion of the roadway.
- The roadway slope should not exceed 15 percent.
- Gravel roads should be a minimum 4-inch thick, 2-3 inch coarse aggregate base applied immediately after grading, or as recommended by soils engineer.
- Chemical stabilizers or water are usually required on gravel or dirt roads to prevent dust (see Dust Control ESC 21).

REQUIREMENTS

- Maintenance
  - Periodically apply additional aggregate on gravel roads.
  - Active dirt construction roads are commonly watered three or more times per day during the dry season.
  - Inspect weekly, and after each rain.
  - Repair any eroded areas immediately.
- Cost
  - Gravel construction roads are moderately expensive, but cost is often balanced by reductions in construction delay.
  - No additional costs for dust control on construction roads should be required above that needed to meet local air quality requirements.

LIMITATIONS

- The roadway must be removed or paved when construction is complete.
- Certain chemical stabilization methods may cause storm water or soil pollution and should not be used (see Dust Control ESC 21).
- Management of construction traffic is subject to air quality control measures. Contact the local air quality management agency.

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ◒ O&M Costs
- ◒ Maintenance
- ○ Training
- ◒ Suitability for Slopes >5%

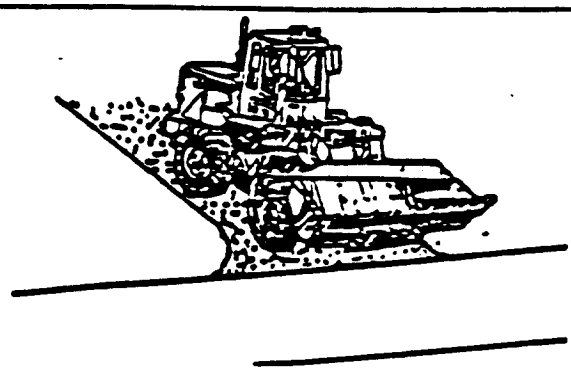
● High ○ Low

ESC23

Best Management Practices

R0072297

BMP: STABILIZED CONSTRUCTION ENTRANCE



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

GENERAL DESCRIPTION

The construction entrance practice is a stabilized pad of aggregate underlain with filter cloth located at any point where traffic will be entering or leaving a construction site to or from a public right-of-way, street, alley, sidewalk or parking area. Stabalizing the construction entrance significantly reduces the amount of sediment (dust, mud) tracked off-site, especially if a washrack incorporated for removing caked on sediment.

SUITABLE APPLICATIONS

- All points of construction ingress and egress.
- Unpaved areas where sediment tracking occurs from site onto paved roads.

INSTALLATION/APPLICATION CRITERIA

- Construct on level ground where possible.
- Stones should be 1-3 inches.
- Minimum depth of stones should be 6 inches or as recommended by soils engineer.
- Length should be 50-foot minimum, and 30-foot minimum width.
- Provide ample turning radii as part of entrance.

REQUIREMENTS

- Maintenance
  - Inspect monthly and after each rainfall.
  - Replace gravel material when surface voids are visible.
  - Remove all sediment deposited on paved roadways within 24 hours.
  - Remove gravel and filter fabric at completion of construction
- Cost: Average annual cost for installation and maintenance (Source: EPA, 1992)
  - Without Wash Rack: $1500 each.
  - With Wash Rack: $2200 each.

LIMITATIONS

- Requires periodic top dressing with additional stones.
- Should be used in conjunction with street sweeping on adjacent public right-of-way.

Targeted Pollutants

- ◒ Sediment
- ◒ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

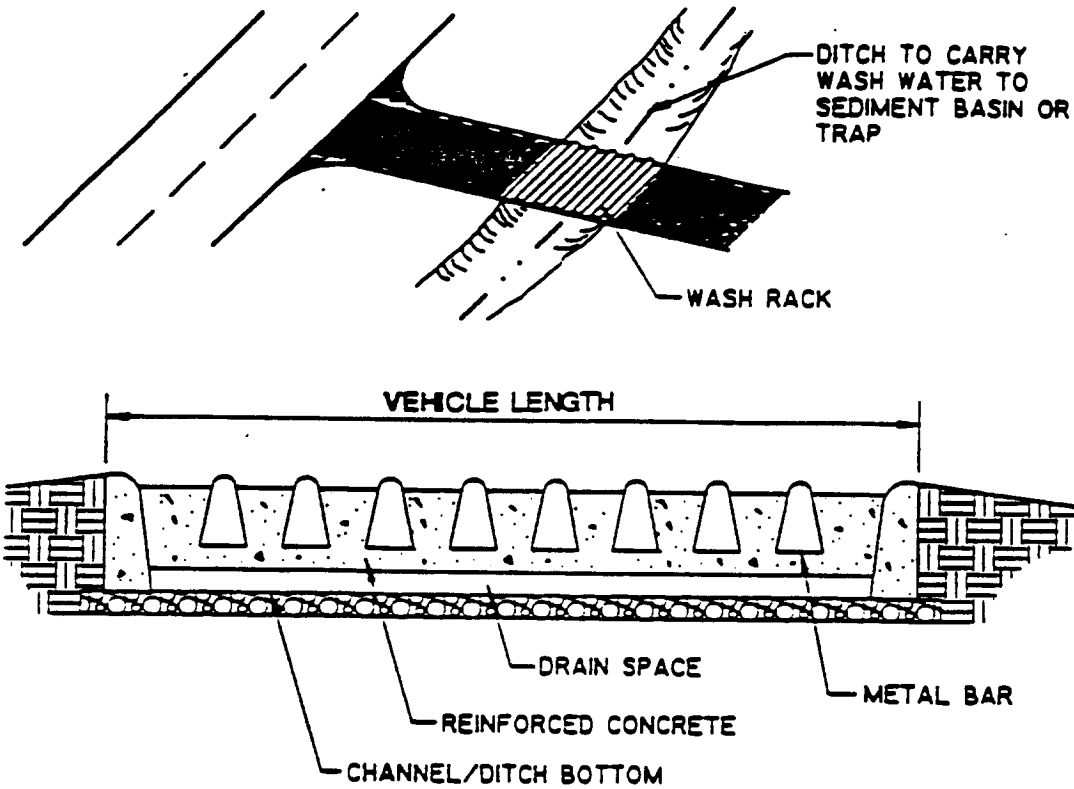
● High ○ Low

ESC24

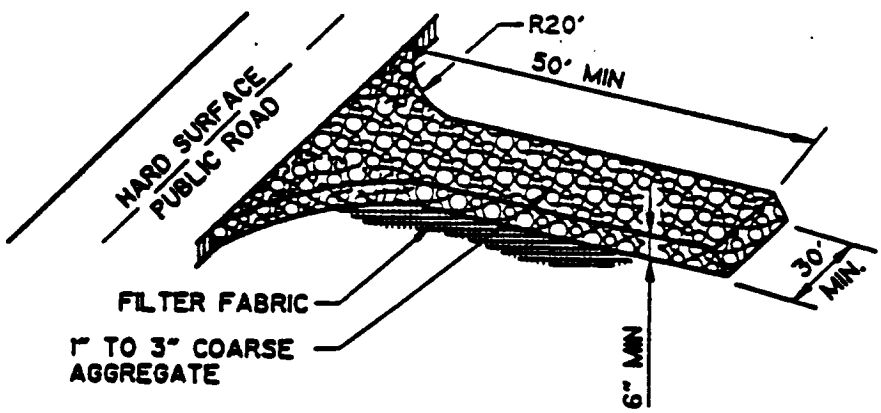
Best Management Practices

R0072298

Additional Information — Stabilized Construction Entrance



WASH RACK (SCHEMATIC)

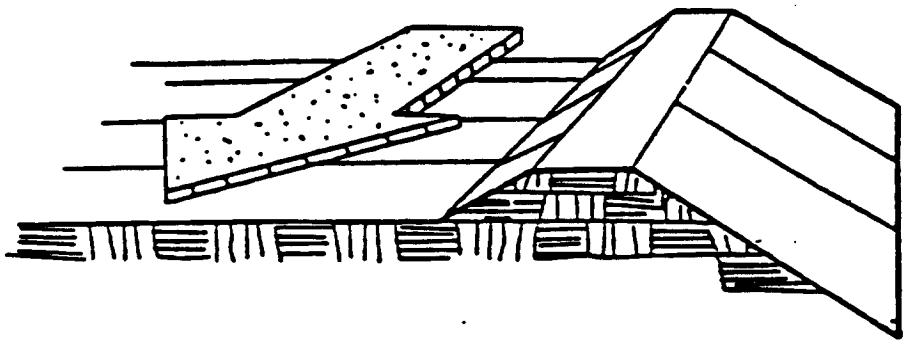


STABILIZED CONSTRUCTION ENTRANCE

ESC24

R0072299

BMP: EARTH DIKE



Objectives

- Housekeeping Practices
- **Contain Waste**
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- **Protect Slopes/Channels**
- **Control Site Perimeter**
- **Control Internal Erosion**

GENERAL DESCRIPTION

The temporary earth dike is a temporary berm or ridge of compacted soil, used to divert runoff or channel water to a desired location.

SUITABLE APPLICATIONS

Earth dikes are typically used to divert concentrated runoff through disturbed areas into another BMP (e.g., sediment basins), to divert runoff away from disturbed or unstable slopes, to divert runoff from off-site and undisturbed areas around disturbed areas, and as a containment for construction materials and wastes. The dikes should remain in place until the disturbed areas are permanently stabilized. The dikes must be on-site and must safely convey anticipated flood flows.

INSTALLATION/APPLICATION CRITERIA

- All dikes should be compacted by earth-moving equipment.
- All dikes should have positive drainage to a stabilized outlet.
- Top width may be wider and side slopes may be flatter at crossings for construction traffic.
- Dikes should direct sediment-laden runoff into a sediment trapping device.
- Dikes should be stabilized with vegetation, chemicals, or physical devices.

REQUIREMENTS

- Maintenance
  - Inspect periodically and after every significant rainfall; repair as necessary.
- Cost
  - Cost ranges from $15 to $55 per foot for both earthwork and stabilization and depends on availability of material, site location, and access.

LIMITATIONS

Dikes should not be used for drainage areas greater than 10 acres, or along slopes greater than 10 percent. For larger areas more permanent drainage structures should be built. All drainage structures should be built in compliance with local municipal requirements.

- Earth dikes may create more disturbed area on site and become barriers to construction equipment.
- Earth dikes must be stabilized immediately, which adds cost and maintenance concerns.
- Diverted storm water may cause downstream flood damage.
- Dikes should not be constructed of soils which may be easily eroded.
- Regrading the site to remove the dike may add additional cost.

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ◒ Oil & Grease
- ○ Floatable Materials
- ◒ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ◒ Suitability for Slopes >5%

● High ○ Low

ESC30

Best Management Practices

Additional Information — Earth Dike

Erosion and Sediment Control Handbook, S.J. Goldman, K. Jackson, T.A. Bursetynsky, P.E., McGraw Hill Book Company.

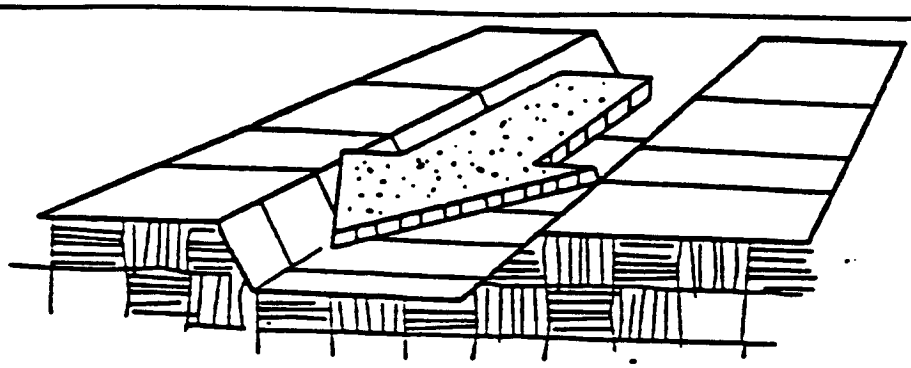
Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, June 1981.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency - November 1988.

R0072301

ESC30

BMP: TEMPORARY DRAINS AND SWALES



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- **Protect Slopes/Channels**
- **Control Site Perimeter**
- **Control Internal Erosion**

GENERAL DESCRIPTION

Temporary drains and swales are used to divert off-site runoff around the construction site, divert runoff from stabilized areas around disturbed areas, and direct runoff into sediment basins or traps.

SUITABLE APPLICATIONS

Temporary drains and swales are appropriate for diverting any upslope runoff around unstabilized or disturbed areas of the construction site:

- Prevent slope failures.
- Prevent damage to adjacent property.
- Prevents erosion and transport of sediments into water ways.
- Increases the potential for infiltration.
- Diverts sediment-laden runoff into sediment basins or traps.

INSTALLATION/APPLICATION CRITERIA

Temporary drainage swales will effectively convey runoff and avoid erosion if built properly:

- Size temporary drainage swales using local drainage design criteria.
- A permanent drainage channel must be designed by a professional engineer (see the local drainage design criteria for proper design).
- At a minimum, the drain/swale should conform to predevelopment drainage patterns and capacities.
- Construct the drain/swale with an uninterrupted, positive grade to a stabilized outlet.
- Provide erosion protection or energy dissipation measures if the flow out of the drain or swale can reach an erosive velocity.

REQUIREMENTS

- Maintenance
  - Inspect weekly and after each rain.
  - Repair any erosion immediately.
  - Remove sediment which builds up in the swale and restricts its flow capacity.
- Cost
  - The cost of a drainage swale increases with drainage area and slope. Typical. swales for controlling internal erosion are inexpensive.

LIMITATIONS

- Temporary drains and swales or any other diversion of runoff should not adversely impact upstream or downstream properties.
- Temporary drains and swales must conform to local floodplain management requirements.

R0072302

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

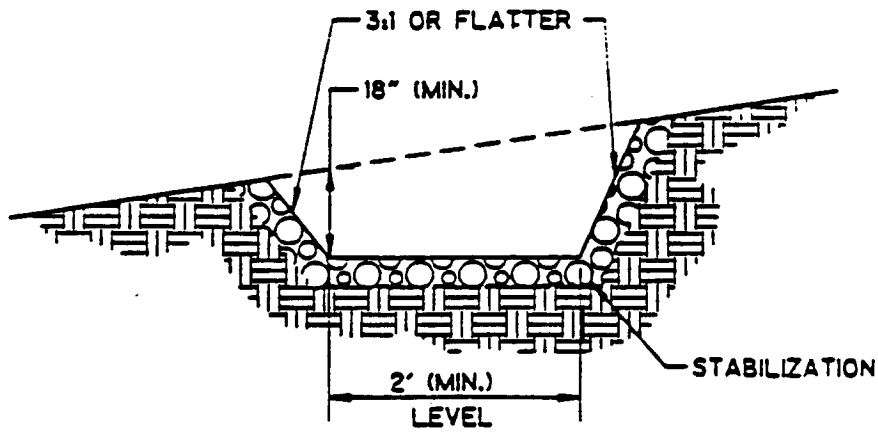
- ◒ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ○ Training
- ◒ Suitability for Slopes >5%

● High ○ Low

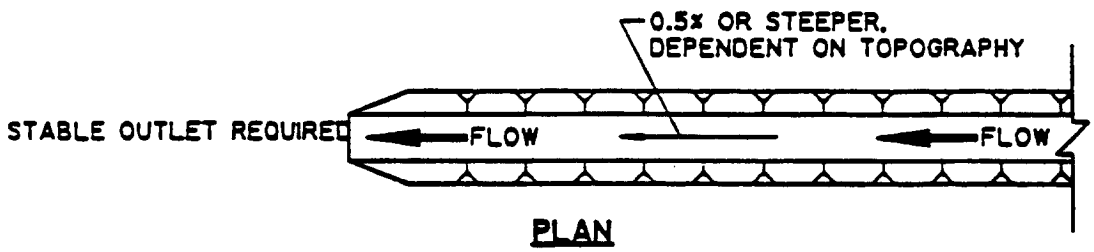
ESC31

Best Management Practices

16-85



CROSS SECTION



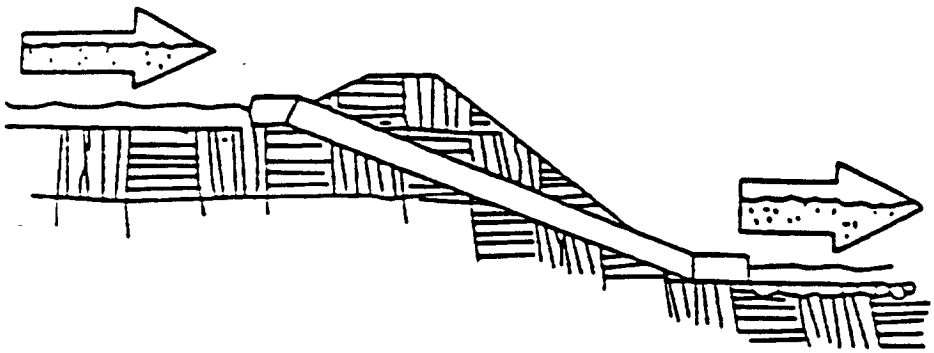
PLAN

TEMPORARY DRAINAGE SWALE

ESC31

R0072303

BMP: SLOPE DRAIN



GENERAL DESCRIPTION

A temporary pipe or lined channel to drain the top of a slope to a stable discharge point at the bottom of a slope without causing erosion.

SUITABLE APPLICATIONS

- Where concentrated flow of surface runoff must be conveyed down a slope in order to prevent erosion.
- Drainage for top of slope diversion dikes or swales.
- Emergency spillway for a sediment basin.
- Drainage for top of cut/fill slopes where water can accumulate.

The types of slope drain can include:

- Pipe drops.
- Flexible downdrains.
- Sectional downdrains.
- Lined terrace drains.

INSTALLATION/APPLICATION CRITERIA

- Secure inlet and surround with dikes to prevent gully erosion, and anchor pipe to slope.
- Size to convey at least the peak of a 10-year, 24-hour storm (See local flood control agency for requirements).
- Stabilize outlet.

REQUIREMENTS

- Maintenance
  - Structure must be inspected regularly and after storms.
  - Inlet must be free of undercutting and no water should circumvent the entry.
  - Outlet should not produce erosion; velocity dissipators must be maintained.
  - Pipe anchors must be checked to ensure that the pipe remains anchored to the slope.
- Cost
  - CalTrans Cost Schedule gives regional cost ranges.

LIMITATIONS

- Maximum drainage area per slope drain is 5 acres. (For large areas use a paved chute, rock lined channel or additional pipes.)
- Clogged slope drains will force water around the pipe and cause slope erosion.
- Dissipation of high flow velocities at the pipe outlet is required to avoid downstream erosion.
- Failure can result in flooding and severe erosion.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- **Protect Slopes/Channels**
- Control Site Perimeter
- Control Internal Erosion

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ◒ Suitability for Slopes >5%

● High ○ Low

ESC32

Best Management Practices

16 - 88

Additional Information — Slope Drain

Design:
Unless specified by the local municipality, the capacity for temporary drains should be sufficient to handle the peak runoff from a 10-year, 24-hour rainfall event. The pipe size may be computed using the Rational Method or a method established by the local municipality. Higher flows must be safely stored or routed to prevent any offsite concentration of flow, and any erosion of the slope.

As a guide, temporary pipe slope drains should not be sized smaller than shown in the following table:

MINIMUM PIPE DIAMETER	MAXIMUM DRAINAGE AREA (ACRES)
12"	0.5
18"	1.5
21"	2.5
24"	3.5
30"	5.0

Permanent improvements must be designed and installed if the drainage area is greater than 5 acres.

The following additional design criteria should be considered:

- Construct the pipe slope drain entrance of a standard flared end section with a minimum 6-inch metal toe plate to prevent runoff from undercutting the pipe inlet. The slope of the entrance is usually at least 3 percent.
- Thoroughly compact the soil around and under the pipe and entrance section.
- Securely fasten the slope drain sections together, have gasketed watertight fittings, and securely anchored into the soil.
- Secure the flared inlet section to the slope drain and have watertight connecting bands.
- Use interceptor dikes to direct runoff into a slope drain. The height of the dike should be at least 1 foot higher at all points than the top of the inlet pipe.
- If the pipe slope drain is conveying sediment-laden water, direct all flows into a sediment trap (ESC55) or sediment basin (ESC56).
- Unless the pipe directly enters a sediment trap/basin, stabilize the area below the outlet with a riprap apron.

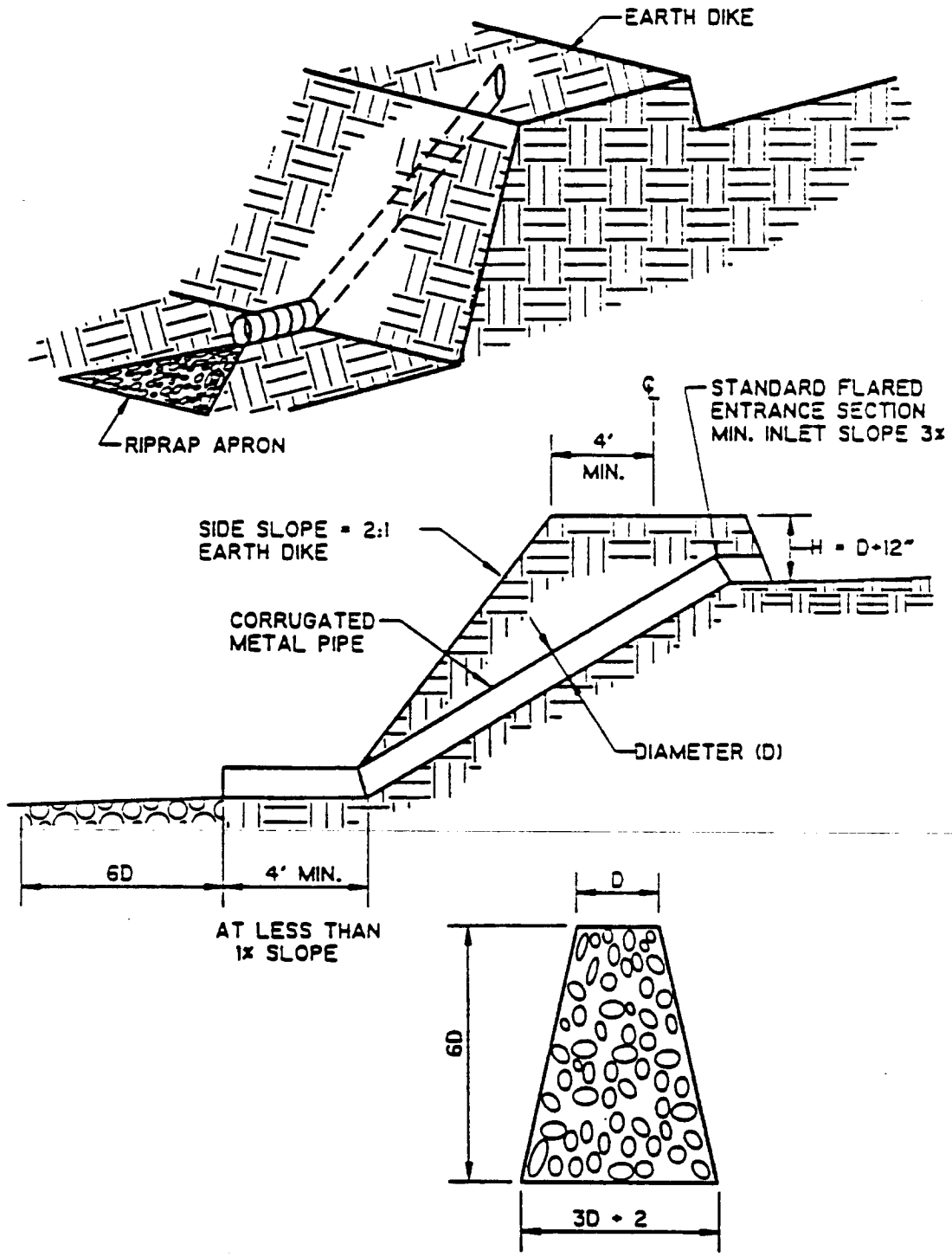
Limitations
Installation is critical for effective use of the pipe slope drain to minimize potential gully erosion. Maximum drainage area per pipe slope drain is 5 acres. For larger areas use a paved chute, rock lined channel or additional pipes. (See the local municipality for drainage requirements)

- During large storms, pipe slope drains may become clogged or overcharged, forcing water around the pipe and causing extreme slope erosion.
- Structures for dissipation of high flow velocities at the pipe outlet must be constructed to avoid downstream erosion.
- Failure of this type of temporary structure may result in flooding and severe erosion.
- If the sectional downdrain is not sized correctly, the runoff can spill over the drain sides causing gully erosion, and potential failure of the structure.

ESC32

R0072305

Additional Information — Slope Drain



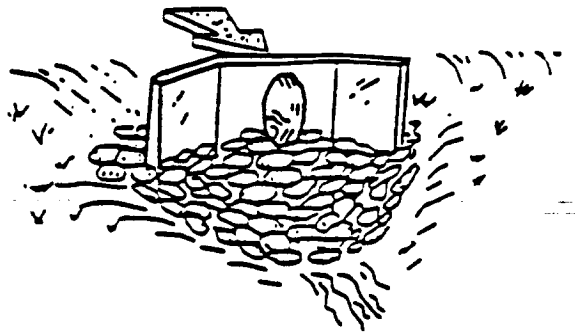
RIPRAP SHOULD CONSIST OF 6" DIAMETER STONE PLACED AS SHOWN AND SHOULD BE A MINIMUM OF 12" IN THICKNESS.

PIPE SLOPE DRAIN (RIGID)

ESC32

R0072306

BMP: OUTLET PROTECTION



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- **Protect Slopes/Channels** (circled)
- Control Site Perimeter
- Control Internal Erosion

GENERAL DESCRIPTION

Rock outlet protection is a physical device composed of rock, grouted riprap, or concrete rubble which is placed at the outlet of a pipe to prevent scour of the soil caused by high pipe flow velocities, and to absorb flow energy to produce non-erosive velocities.

SUITABLE APPLICATIONS

- Wherever discharge velocities and energies at the outlets of culverts, conduits or channels are sufficient to erode the next downstream reach.
- Rock outlet protection is best suited for temporary use during construction because it is usually less expensive and easier to install than concrete aprons or energy dissipators.
- A sediment trap below the pipe outlet is recommended if runoff is sediment laden.
- Permanent rock riprap protection should be designed and sized by the engineer as part of the culvert, conduit or channel design.
- Grouted riprap should be avoided in areas of freeze and thaw because the grout will break up.

INSTALLATION/APPLICATION CRITERIA

Rock outlet protection is effective when the rock is sized and placed properly. When this is accomplished, rock outlets do much to limit erosion at pipe outlets. Rock size should be increased for high velocity flows. General recommendations for rock size and length of outlet protection mat are presented in the additional information sheet. Best results are obtained when sound, durable, angular rock is used. CalTrans Standard Specifications or the local municipality can provide additional specifications for constructing outlet protection devices.

REQUIREMENTS

- Maintenance
  - Inspect after each significant rain for erosion and/or disruption of the rock, and repair immediately.
  - Grouted or wire-tied rock riprap can minimize maintenance requirements.
- Cost
  - CalTrans Cost Schedule gives regional cost ranges.

LIMITATIONS

- Large storms often wash away the rock outlet protection and leave the area susceptible to erosion.
- Sediment captured by the rock outlet protection may be difficult to remove without removing the rock.
- Outlet protection may negatively impact the channel habitat.

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

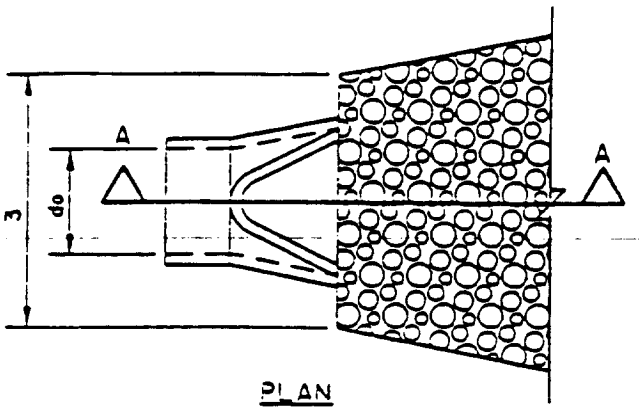
- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

● High ○ Low

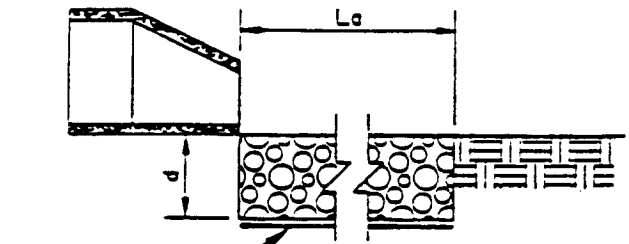
ESC40

Best Management Practices

Additional Information — Outlet Protection



PLAN

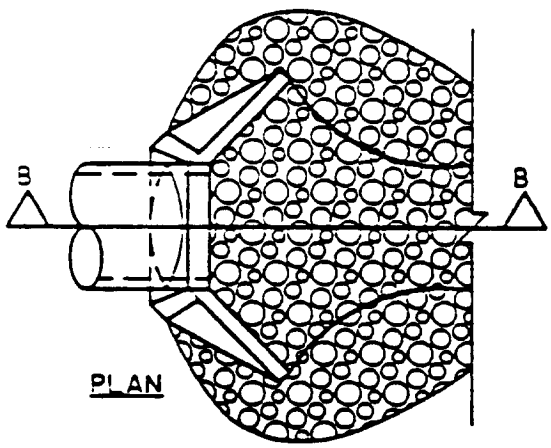


PIPE OUTLET TO FLAT AREA
WITH NO DEFINED CHANNEL

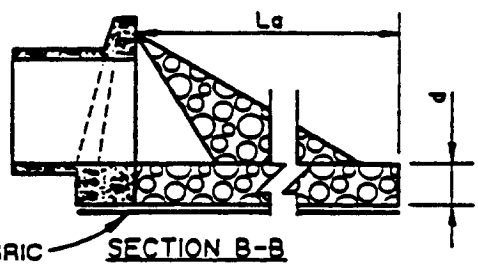
La = LENGTH OF APRON
do = INSIDE PIPE DIAMETER
w = APRON WIDTH
d = APRON THICKNESS

NOTES

1. APRON LINING MAY BE RIPRAP, GROUTED RIPRAP, OR CONCRETE
2. PIPE DIAMETER, APRON DIMENSIONS, AND AVERAGE ROCK SIZE FOR RIPRAP ARE BASED ON THE DESIGN FLOW RATE AND VELOCITY. La AND ROCK SIZE MUST BE SET TO SLOW THE FLOW TO NON-EROSIVE VELOCITIES (e.g., LESS THAN 10 fps). SEE CALTRANS AND LOCAL AGENCY DESIGN CRITERIA FOR APPROPRIATE SIZING CRITERIA.
3. d = 1.5 TIMES THE MAXIMUM ROCK SIZE DIAMETER BUT NOT LESS THAN 6 INCHES.



PLAN



PIPE OUTLET TO WELL-DEFINED CHANNEL

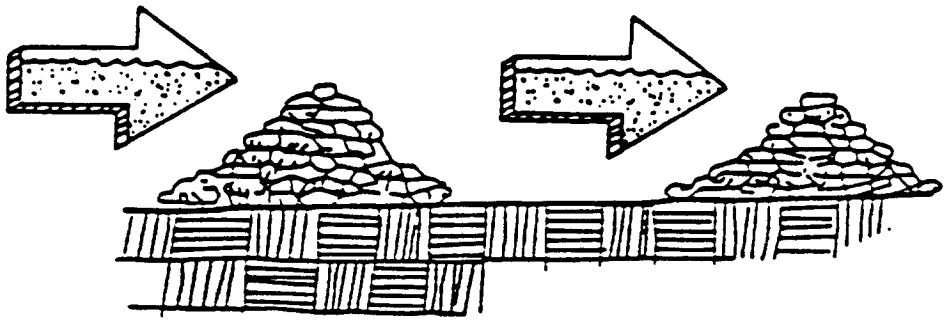
R0072308

ESC40

PIPE OUTLET CONDITIONS

16-96

BMP: CHECK DAMS



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- **Protect Slopes/Channels**
- Control Site Perimeter
- Control Internal Erosion

GENERAL DESCRIPTION

Small temporary dams constructed across a swale or drainage ditch. Check dams reduce the velocity of concentrated stormwater flows, thereby reducing erosion of the swale or ditch, and promoting sedimentation behind the dam. If properly anchored, brush or rock filter berms (ESC53) may be used for check dams.

SUITABLE APPLICATIONS

- Used to prevent erosion by reducing the velocity of channel flow in small intermittent channels and temporary swales.
- May also promote sedimentation behind the dam, but should not be considered to be a primary sediment trapping device because subsequent storms will scour and resuspend much of the trapped sediment.

INSTALLATION/APPLICATION CRITERIA

- Check dams should be placed at a distance and height to allow small pools to form between each one.
- Backwater from a downstream check dam should reach the toe of the upstream check dam.
- Major floods (2 year storm or larger) should safely flow over the check dam without an increase in upstream flooding or destruction of the checkdam.
- Primarily used in small, steep channels where velocities exceed 2 fps.
- Used in steep terrain where velocity reduction is required.
- A deep sump may be provided immediately upstream of the check dam to capture excessive sediment.
- Check dams may be built of rocks or logs, which are secured against damage during significant floods.

REQUIREMENTS

- Maintenance
  - Inspect for sediment buildup behind the check dam and signs of erosion around the check dam after each rain.
  - Remove accumulated sediment whenever it reaches one-half the sump depth.
- Cost
  - See CalTrans Cost Schedule for regional cost data.

LIMITATIONS

- Use only in small open channels which drain 10 acres of less.
- Not to be used in live streams.
- Do not install in lined or vegetated channels.

R0072309

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

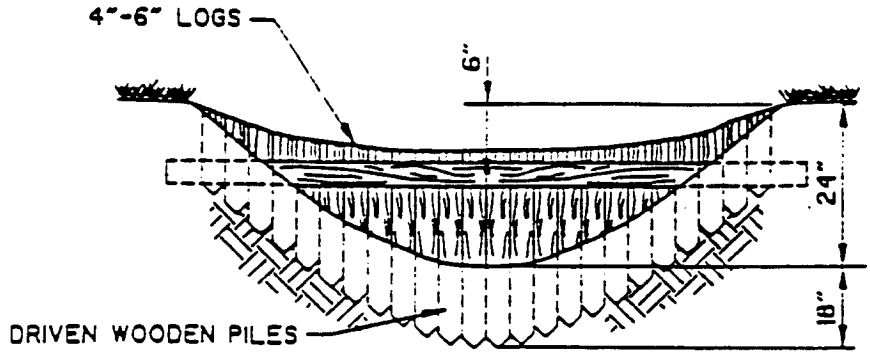
● High ○ Low

ESC41

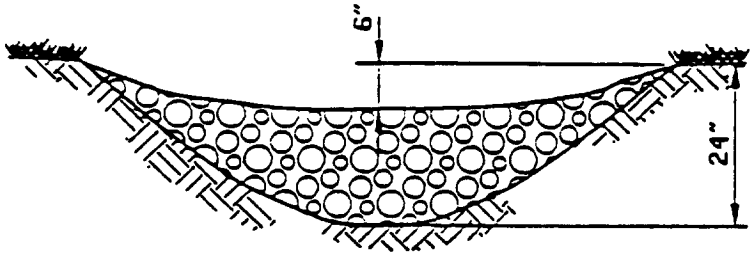
Best Management Practices

16-97

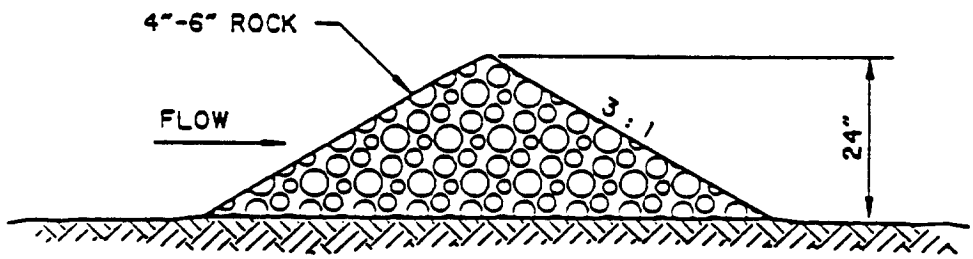
Additional Information — Check Dams



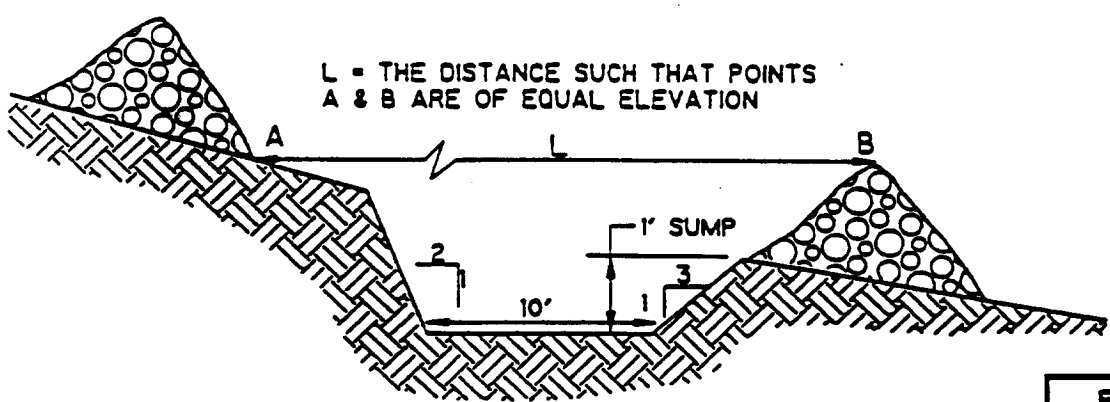
LOG CHECK DAM



ROCK CHECK DAM



ROCK CHECK DAM CROSS-SECTION



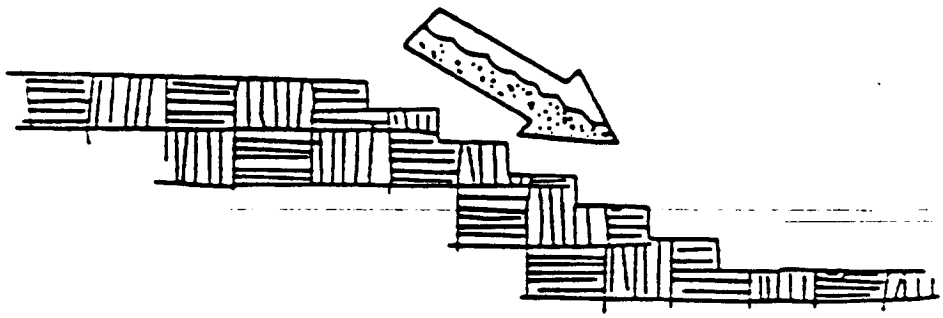
SPACING BETWEEN CHECK DAMS

ESC41

R0072310

16 - 99

BMP: SLOPE ROUGHENING/TERRACING



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- **Stabilize Disturbed Areas**
- **Protect Slopes/Channels**
- Control Site Perimeter
- Control Internal Erosion

GENERAL DEFINITION

Slope roughening/terracing creates microclimates for establishing vegetation, reduces runoff velocity, increases infiltration, and provides small depressions for trapping sediment.

SUITABLE APPLICATIONS

- Any cleared area prior to seeding and planting.
- Required for cleared, erodible slopes steeper than 3:1 and higher than 5 feet prior to seeding and planting.

INSTALLATION/APPLICATION CRITERIA

Slope roughening/terracing is performed in several ways:

- Stair-step grading.
- Grooving.
- Furrowing.
- Tracking.
- Rough grading.
- No grading.

REQUIREMENTS

- Maintenance
  - Inspect roughened slopes weekly and after rainfall for excessive erosion.
  - Revegetate as quickly as possible.
- Cost (source: EPA, 1992)
  - Surface Roughening: Performed at no (e.g., rough grading) to low (e.g., tracking) cost.
  - Terracing: Average annual cost is $4 per linear foot (2 year useful life).

LIMITATIONS

- Roughening is of limited effectiveness on its own, but is used to speed revegetation.

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ○ Training
- ● Suitability for Slopes >5%

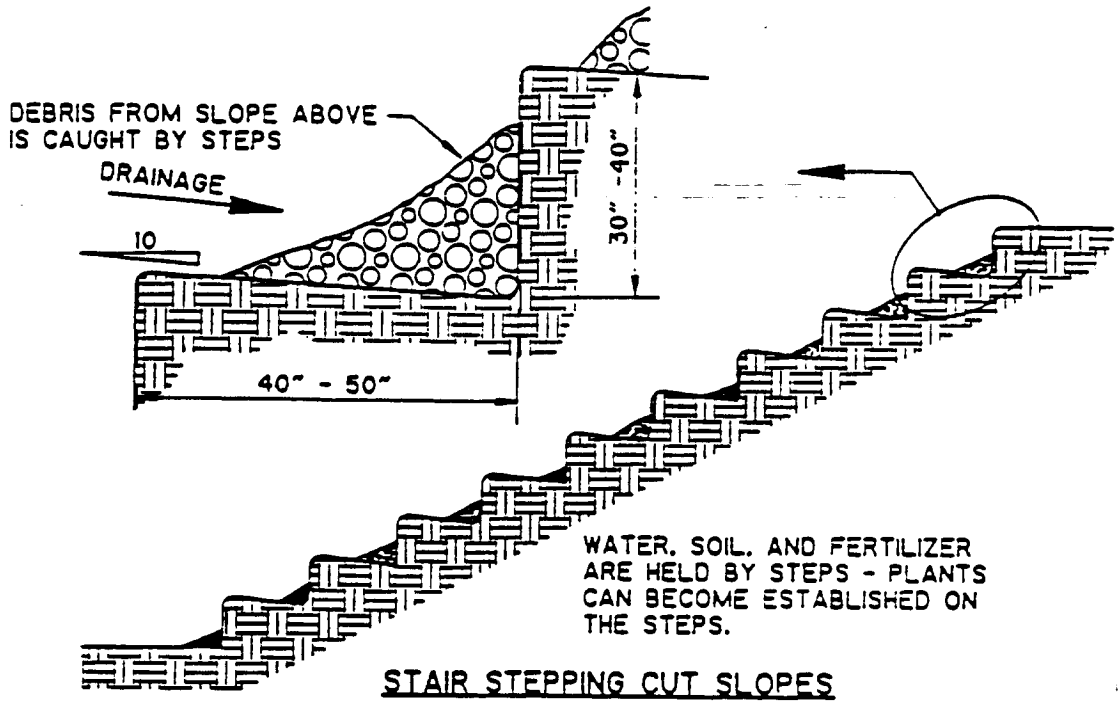
● High ○ Low

ESC42

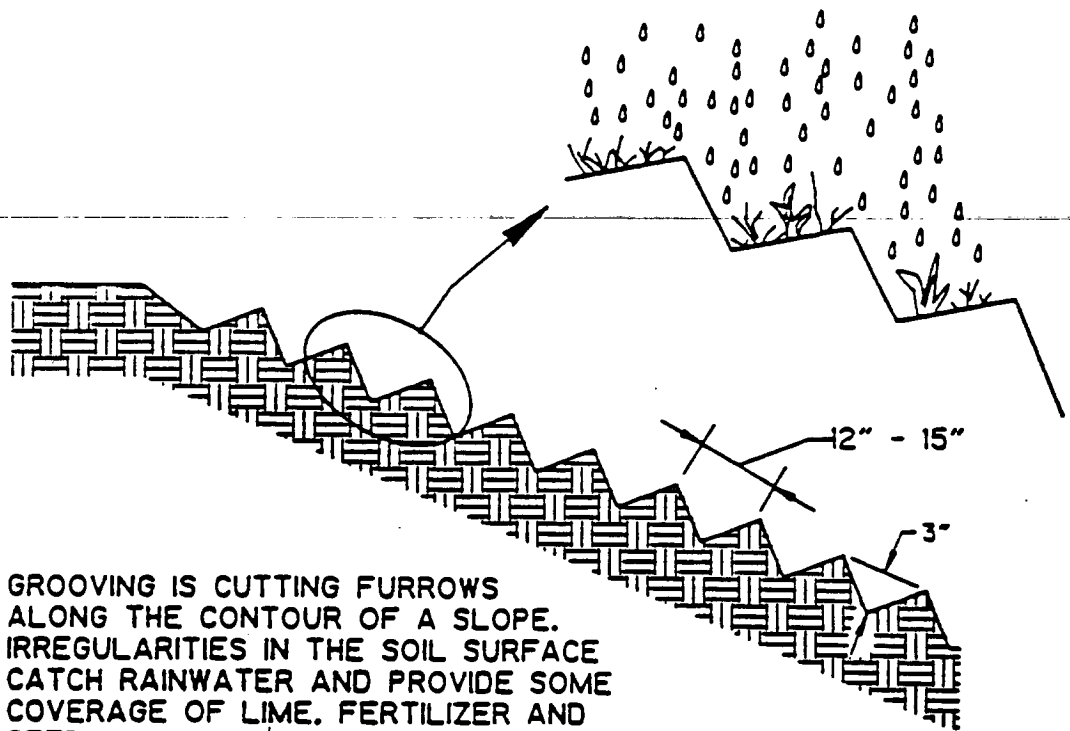
Best Management Practices

R0072311

Additional Information — Slope Roughening/Terracing



STAIR STEPPING CUT SLOPES



GROOVING IS CUTTING FURROWS ALONG THE CONTOUR OF A SLOPE. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND PROVIDE SOME COVERAGE OF LIME, FERTILIZER AND SEED.

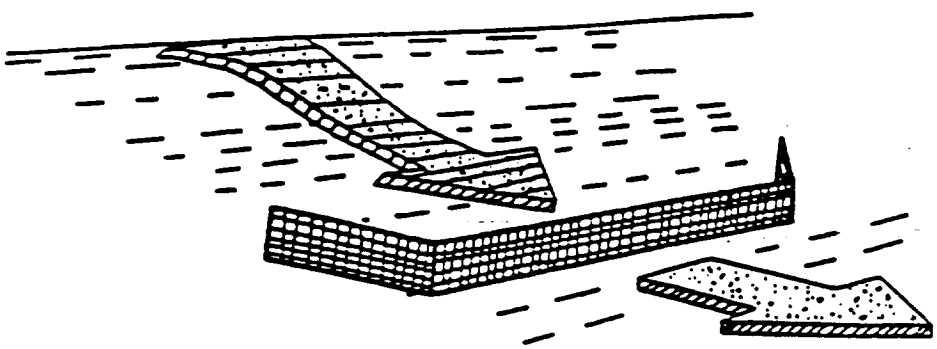
GROOVING SLOPES

ESC42

STAIR-STEPPING CUT SLOPES AND GROOVING SLOPES

R0072312

BMP: SILT FENCE



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

GENERAL DESCRIPTION

A silt fence is made of a filter fabric which has been entrenched, attached to supporting poles, and sometimes backed by a wire fence for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

SUITABLE APPLICATIONS

- Along the perimeter of the site.
- Below the toe of a cleared slope.
- Along streams and channels.
- Around temporary spoil areas.
- Across swales with catchments less than 1 acre.
- Below other small cleared areas.

INSTALLATION/APPLICATION

- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 feet at any point.
- No more than 1 acre, 100 ft., or 0.5 cfs of concentrated flow should drain to any point along the silt fence.
- Turn ends of fence uphill.
- Provide area behind the fence for runoff to pond and sediment to settle (approx. 1200 sq. ft. per acre draining to the silt fence).
- Select filter fabric which retains 85% of the soil, by weight, based on sieve analysis, but is not finer than an equivalent opening size of 70.

REQUIREMENTS

- Maintenance
  - Inspect weekly and after each rainfall.
  - Repair wherever fence is damaged.
  - Remove sediment when it reaches 1/3 the height of the fence.
- Cost (source: EPA, 1992)
  - Average annual cost for installation and maintenance (assumes 6 month useful life): $7 per lineal foot ($850 per drainage acre)

LIMITATIONS

- Do not use where 85% of the soil, by weight, passes through a No. 200 sieve because the filter fabric will clog.
- Do not place fence on a slope, or across any contour line.
- Do not use in streams, channels, or anywhere flow has concentrated.
- Do not use in locations where ponded water may cause flooding.

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ◒ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

● High ○ Low

ESC50

Best Management Practices

R0072313

Additional Information — Silt Fence

To reduce the chance of clogging, it is preferable to specify a fabric with openings as large as allowed by the criteria. No fabric should be specified with an EOS smaller than U.S. Standard Sieve No. 100 [0.0059 in. (0.15 mm.)]. If 85 percent or more of a soil, by weight, passes through the openings in a No. 200 sieve [0.0029 in. (0.074 mm.)], filter fabric should not be used. Most of the particles in such a soil would not be retained if the EOS was too large, and they would clog the fabric quickly if the EOS was small enough to capture the soil.

The fence should be supported by a wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Filter fabric material should contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0° F. to 120° F.

Installation Guidelines:
Filter fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- Posts should be spaced a maximum of 6 feet apart and driven securely into the ground a minimum of 30 inches.
- A trench should be excavated approximately 8 inches wide and 12 inches deep along the line of posts and upslope from the barrier.
- When standard strength filter fabric is used, a wire mesh support fence should be fastened securely to the upslope side of the posts using heavy-duty wire staples at least 1 inch long, tie wires or hog rings. The wire should extend into the trench a minimum of 4 inches.
- The standard strength filter fabric should be stapled or wired to the fence, and 40 inches of the fabric should extend into the trench. When extra-strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated and the filter fabric stapled or wired directly to the posts.
- Avoid the use of joints. The filter fabric should be purchased in a continuous roll, then cut to the length of the barrier. When joints are necessary, filter cloth should be spliced together only at a support post, with a minimum 6 inch overlap, and both ends securely fastened to the post.
- The trench should be backfilled with compacted native material.

Requirements
Maintenance:

Inspect monthly during dry periods and immediately after each rainfall. Repair as necessary. Sediment must be removed when it reaches approximately one third the height of the fence, especially if heavy rains are expected.

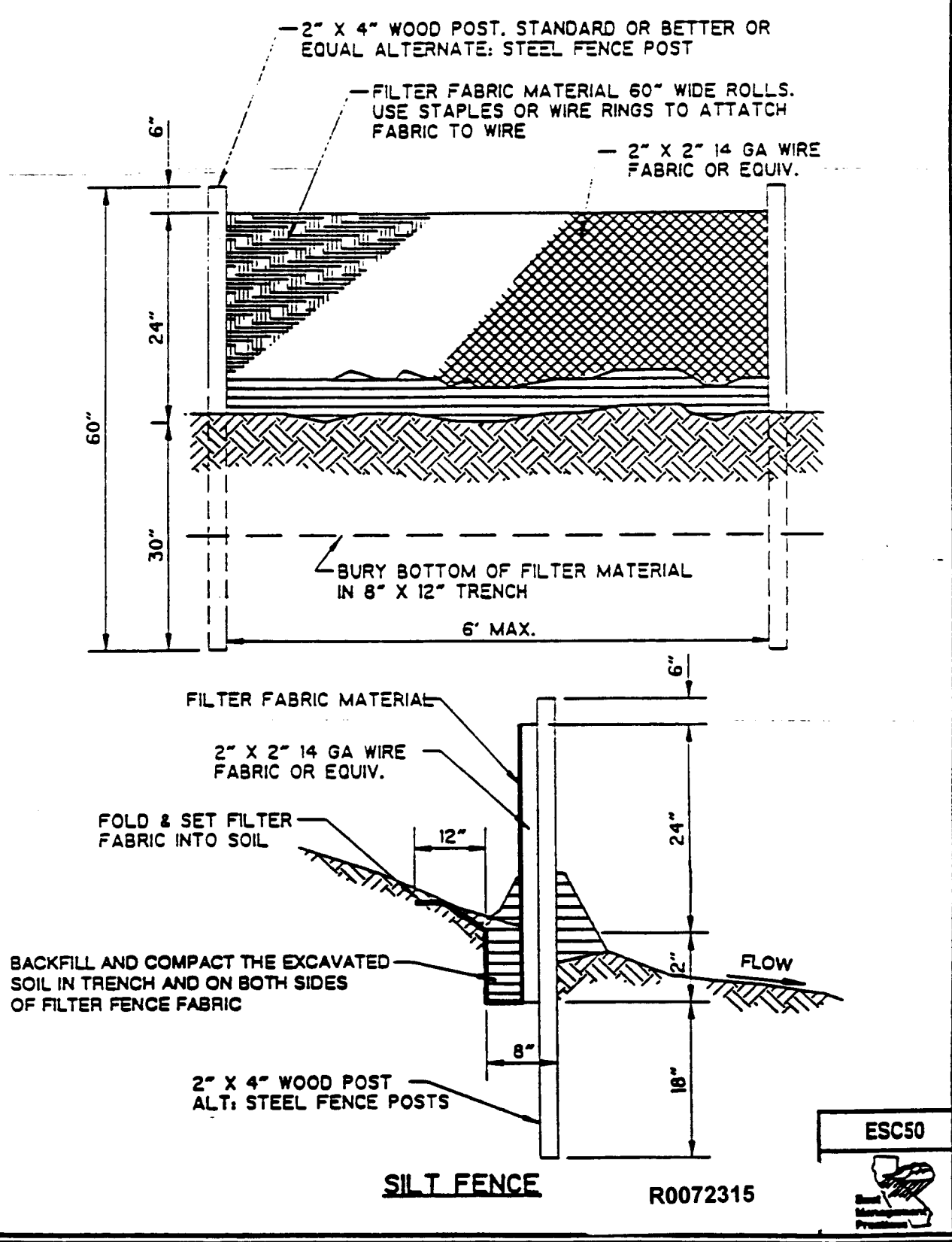
Filter fences should not be removed until the upslope area has been permanently stabilized.

Limitations
- Filter fences will create a temporary sedimentation pond on the upstream side of the fence and may cause temporary flooding. Fences not constructed on a level contour will be overtopped by concentrated flow resulting in failure of the filter fence.
- Filter fences are not practical where large flows of water are involved, hence the need to restrict their use to drainage areas of one acre or less, and flow rates of less than 0.5 cfs.
- Problems may arise from incorrect selection of pore size and/or improper installation.
- Do not allow water depth to exceed 1.5 ft. at any point.
- Improperly installed fences are subject to failure from undercutting, overlapping, or collapsing.

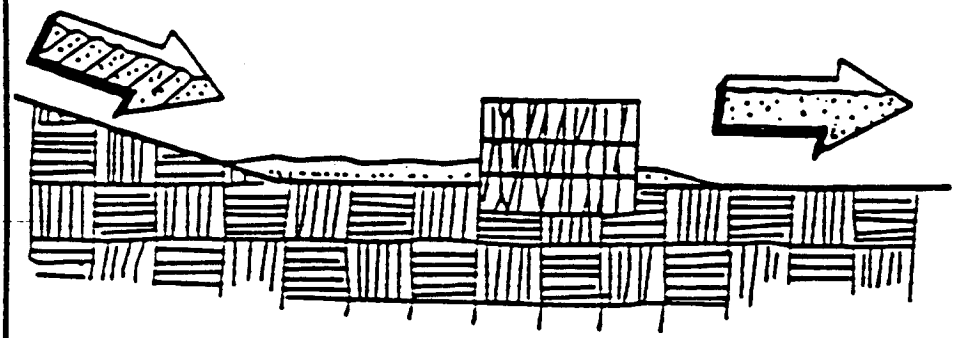
ESC50

R0072314

Additional Information — Silt Fence



BMP: STRAW BALE BARRIERS



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- (●) Control Site Perimeter
- (●) Control Internal Erosion

GENERAL DEFINITION

A straw bale barrier consists of straw bales placed end to end along a level contour in a shallow trench and staked to hold them in place. The barrier detains runoff, creating a pond behind the barrier where sedimentation occurs.

SUITABLE APPLICATIONS

- Along the perimeter of the site.
- Along streams and channels.
- Across swales with small catchments.
- Around temporary spoil areas.
- Below other small, cleared areas.

INSTALLATION/APPLICATION CRITERIA

- Use primarily in areas where sheet or rill flow occurs.
- No more than 1/4 acre per 100 feet of barrier should drain to the barrier.
- Install along a level contour.
- Place in a 4-inch deep trench.
- Backfill and compact the excavated soil on the upstream face of the barrier.
- Secure each bale with two stakes.
- Leave enough area (about 1200 sq. ft. per acre) behind the barrier for runoff to pond (no more than 1.5 ft. depth) and sediment to settle.

REQUIREMENTS

- Maintenance
  - Inspect weekly and after each rain.
  - Replace bales which have decomposed or whose bindings have broken.
  - Remove sediment behind the barrier when it reaches a depth of 6 inches.
- Costs (source: EPA, 1992)
  - Average annual cost for installation and maintenance (assumes 3 month useful life): $17 per lineal foot ($6,800 per drainage acre).

LIMITATIONS

- Straw bale barriers are not to be used for extended periods of time because they tend to rot and fall apart.
- Suitable only for sheet flow on slopes of 2% or flatter.
- Not appropriate for large drainage areas, limit to one acre or less.
- Straw bales lose their effectiveness rapidly due to rotting, thus constant maintenance is required.
- Not recommended for concentrated flow, inlet protection, channel flow, and live streams.
- Bale bindings of jute or cotton not recommended.

Targeted Pollutants

- (●) Sediment
- (○) Nutrients
- (○) Toxic Materials
- (○) Oil & Grease
- (○) Floatable Materials
- (○) Other Construction Waste

- (●) Likely to Have Significant Impact
- (○) Probable Low or Unknown Impact

Implementation Requirements

- (●) Capital Costs
- (●) O&M Costs
- (●) Maintenance
- (○) Training
- (○) Suitibility for Slopes >5%

(●) High (○) Low

ESC51

Best Management Practices

R0072316

Additional Information — Straw Bale Barrier

A straw bale barrier consists of a series of secured anchored bales placed to intercept sediment-laden runoff from small drainage areas of disturbed soil. The barrier ponds runoff and allow sediment to settle. Straw bale dikes should not be used for extended periods of time because they tend to rot and fall apart.

The straw bale barrier is used where there are no concentrations of water in a channel or drainageway, and where erosion would occur from sheet flow. These barriers are typically constructed below disturbed areas subject to sheet flow of runoff.

Installation/Application

Straw bale barriers should be used for drainage areas no more than 1/4 acre per 100 feet of barrier length, with no more than 100 ft upstream of any point along the barrier. The barrier should be placed along a level contour no greater than 2:1. When installed and maintained according to the guidelines on this fact sheet, straw bale dikes remove approximately 67% of the sediment transported in construction site runoff. This optimum efficiency can only be achieved through careful maintenance, with special attention to replacing rotted or broken bales. The barrier should be constructed on a level contour to prevent concentration of flow against a small portion of the barrier.

An effective straw bale barrier should be installed in the following manner:

1. Bales should be placed on the contour and in a row with ends tightly abutting the adjacent bales.
2. Leave area for runoff to pond upstream of the barrier by locating barrier away from the toe of slopes. This also provides access for maintenance.
3. Each bale should be embedded in the soil a minimum of (4) inches and placed so the bindings are horizontal. Bindings placed on soil will soon disintegrate and cause the barrier to fail.
4. Bales should be securely anchored in place by either two stakes or re-bars driven through the bale. The first stake in each bale should be driven toward the previously laid bale at an angle to force the bales together. Stakes should be driven flush with the bale.
5. Backfill and compact the excavated soil along the upstream face of the barrier.
6. Remove the barrier when it has served its usefulness so as not to block or impede storm flow or drainage.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Arizona, September 1992.

"Draft - Sedimentation and Erosion Control, An Inventory of Current Practices", U.S.E.P.A., April, 1990.

"Environmental Criteria Manual", City of Austin, Texas.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, Jun 1981.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April, 1992.

Stormwater Management Water for the Puget Sound Basin, Washington State Department of Ecology, The Technical Manual - February 1992, Publication # 91-75.

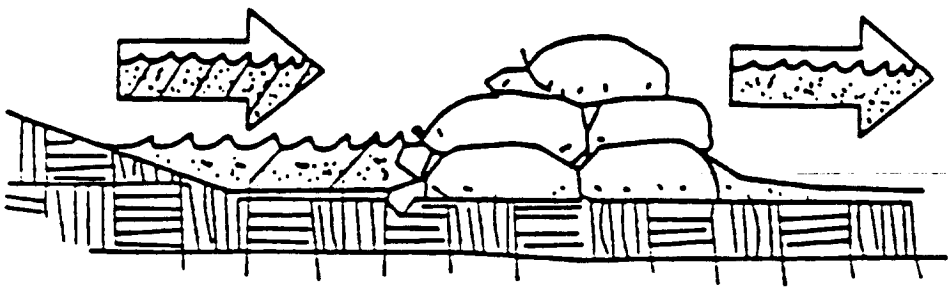
Water Quality for Construction Businesses, City of Bellevue, Washington.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency - November 1988.

ESC51

R0072317

BMP: SAND BAG BARRIER



GENERAL DEFINITION

Stacking sand bags along a level contour creates a barrier which detains sediment-laden water, ponding water upstream of the barrier and promoting sedimentation.

SUITABLE APPLICATIONS

- Along the perimeter of the site.
- Check dams across streams and channels.
- Along streams and channels.
- Barrier for utility trenches in a channel.
- Across swales with small catchments.
- Division dike or berm.
- Below the toe of a cleared slope.
- Create a temporary sediment trap.
- Around temporary spoil areas.
- Below other small cleared areas.

INSTALLATION/APPLICATION CRITERIA

- May be used in drainage areas up to 5 acres.
- Install along a level contour.
- Base of sand bag barrier should be at least 48 inches wide.
- Height of sand bag barrier should be at least 18 inches high.
- 4 inch PVC pipe may be installed between the top layer of sand bags to drain large flood flows.
- Provide area behind barrier for runoff to pond and sediment to settle, size according to sediment trap BMP criteria (ESC55).
- Place below the toe of a slope.
- Use sand bags large enough and sturdy enough to withstand major flooding.

REQUIREMENTS

- Maintenance
  - Inspect after each rain.
  - Reshape or replace damaged sand bags immediately.
  - Remove sediment when it reaches six inches in depth.
- Cost
  - Sand bag barriers are more costly, but typically have a longer useful life than other barriers.

LIMITATIONS

- Sand bags are more expensive than other barriers, but also more durable.
- Burlap should not be used for sand bags.

Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- **Protect Slopes/Channels**
- **Control Site Perimeter**
- **Control Internal Erosion**

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

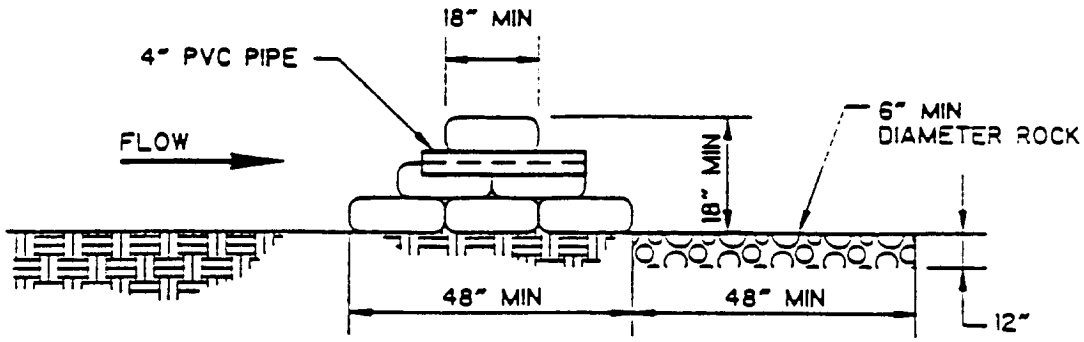
- ● Capital Costs
- ○ O&M Costs
- ○ Maintenance
- ○ Training
- ◒ Suitability for Slopes >5%

● High ○ Low

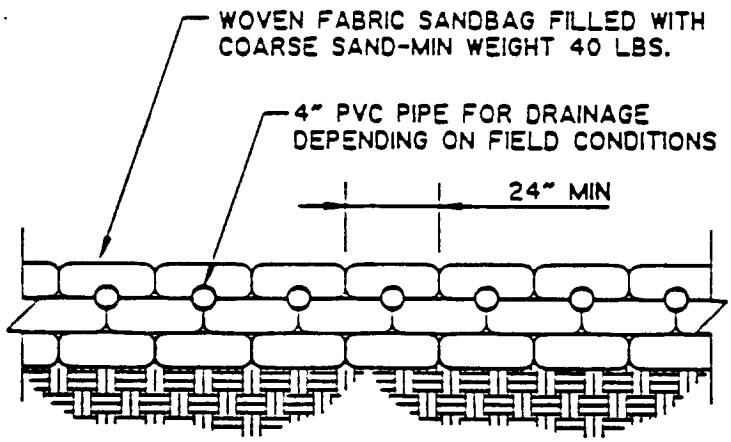
ESC52

Best Management Practices

Additional Information — Sand Bag Barrier



CROSS-SECTION



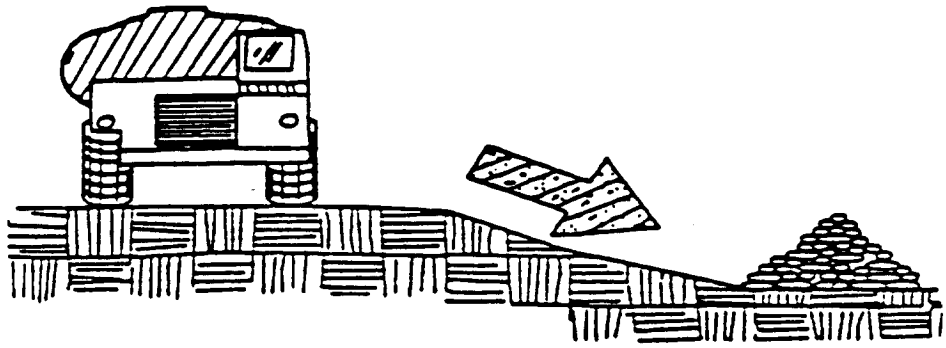
FRONT VIEW

SAND BAG BERM

ESC52

R0072319

BMP: BRUSH OR ROCK FILTER



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- **Protect Slopes/Channels**
- **Control Site Perimeter**
- **Control Internal Erosion**

GENERAL DEFINITION

A rock filter berm is made of rock 3/4 to 3 inches in diameter and placed along a level contour where sheet flow may be detained and ponded, promoting sedimentation. A brush barrier is composed of brush (usually obtained during the site clearing) wrapped in filter cloth and anchored to the toe of the slope. If properly anchored brush or rock filters may be used for sediment trapping and velocity reduction. See Check Dam BMP (ESC41) for more information.

SUITABLE APPLICATIONS

- As check dams across mildly sloped construction roads.
- Below the toe of slopes.
- Along the site perimeter.
- Along streams and channels.
- Around temporary spoil areas.
- Below other small cleared areas.
- At sediment traps at culvert/pipe outlets.

INSTALLATION/APPLICATION CRITERIA

- Use principally in areas where sheet or rill flow occurs.
- For rock filter, use larger rock and place in a staked, woven wire sheathing if placed where concentrated flows occur.
- Install along a level contour.
- Leave area behind berm where runoff can pond and sediment can settle.
- Drainage area should not exceed 5 acres.

REQUIREMENTS

- Maintenance
  - Inspect monthly and after each rainfall.
  - If berm damaged, reshape and replace lost/dislodged rock.
  - Remove sediments when depth reaches 1/3 of berm height, or 1 ft.
- Cost
  - Brush filter: Low to moderate cost if debris from on-site clearing and grubbing is used.
  - Rock filter: Expensive, since off-site materials, hand construction and demolition/ removal are usually required.

R0072320

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ◒ O&M Costs
- ○ Maintenance
- ○ Training
- ◒ Suitability for Slopes >5%

● High ○ Low

ESC53

Best Management Practices

Additional Information — Brush or Rock Filter

Rock Filter

A rock filter consists of open graded rock installed at the toe of a slope, along the perimeter of a developing or disturbed area, and as a checkdam across construction roads. Their purpose is to intercept sediment laden runoff from disturbed areas of the site, allow the runoff to pond, promote sedimentation behind the filter, and slowly release the water as sheet flow.

Rock filters are appropriate where a temporary measure is needed to prevent sediments from entering right-of-ways of traffic areas such as near the toe of slopes, incorporated into temporary stabilized construction entrances (ESC 26), or at other locations along the construction site perimeter. Rock filters may also be used as check dams across one or more lanes of construction traffic temporary roads, or unsurfaced rights of way subject to construction traffic.

Advantages of the rock filters are that they may be less costly than other temporary barriers, and are relatively efficient at sediment removal.

Installation/Application:

Planning:

- Rock filters should be placed along a level contour to intercept sheet flow.
- Allow ample room for ponding, sedimentation, and access by sediment removal equipment between the berm and the toes of slopes.
- Flow through the filter should occur as sheet flow into an undisturbed or stabilized area.
- Installation in stream beds requires large rock, staking of woven wire sheathing, and daily inspection.

Design & Sizing Criteria:

The following design criteria are commonly used to construct filters:

- In Non-Traffic Areas:
  - Maximum flow-through rate per square foot of filter = 60 gpm
  - Height = 18 inches minimum
  - Top width = 24 inches minimum
  - Side slopes = 2:1 or flatter
  - Woven wire sheathing (poultry netting) is recommended in areas of concentrated flow. The wire should be 1 inch diameter hexagonal mesh, galvanized 20 gauge.
  - Build the filter along on a level contour.
  - Rock: 3/4 to 3 inches open graded for sheet flow, 3 to 5 inches open graded for concentrated flow.

- In Construction Traffic Areas:
  - Height = 12" maximum
  - Provide multiple filters in series, spaced as shown.
    Every 300 ft on slopes less than 5 percent
    Every 200 ft on slopes 5 to 10 percent
    Every 100 ft on slopes greater than 10 percent.

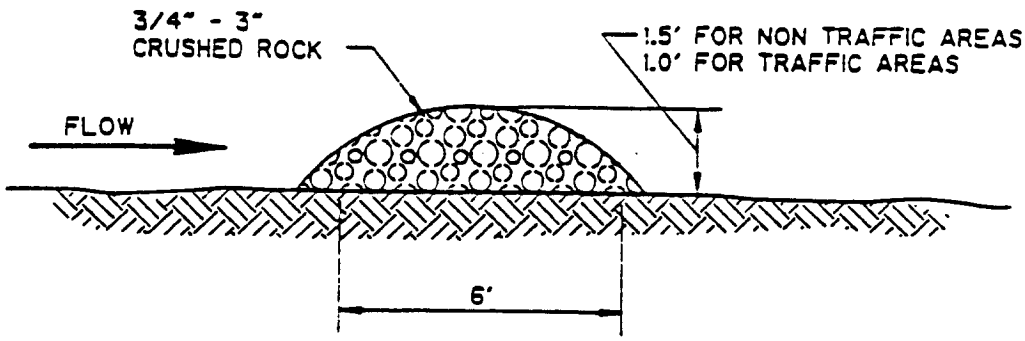
Brush Filter

Brush filters trap and filter sediments in a manner similar to other barriers in this handbook (e.g., silt fence, straw bale barrier, rock filter), but have the advantage of being constructed from brush cleared from the site and usually disposed off-site at a cost.

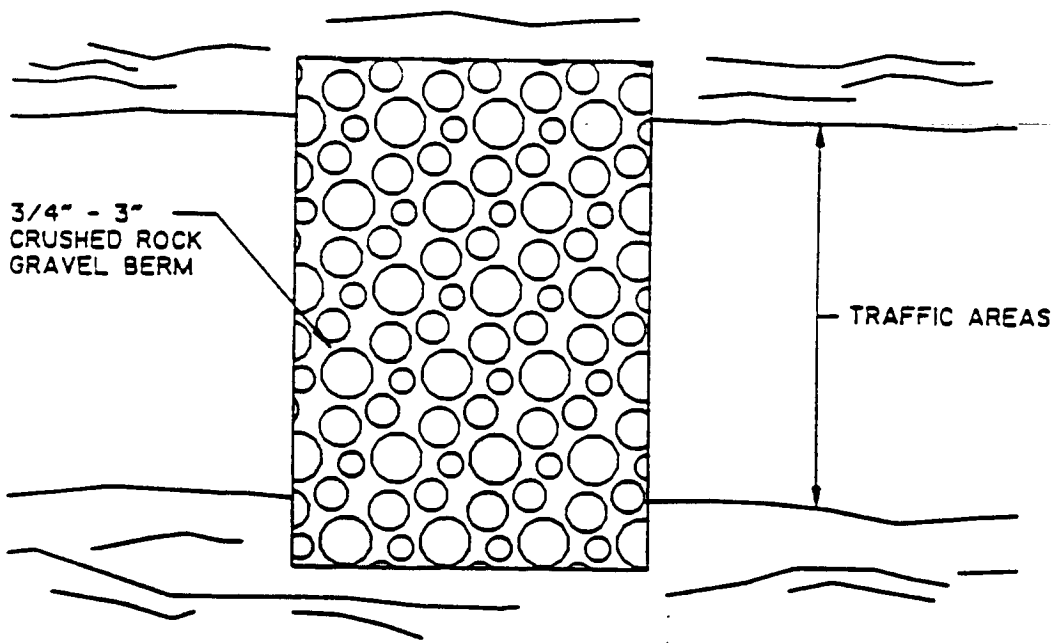
ESC53

R0072321

Additional Information — Brush or Rock Filter



SECTION



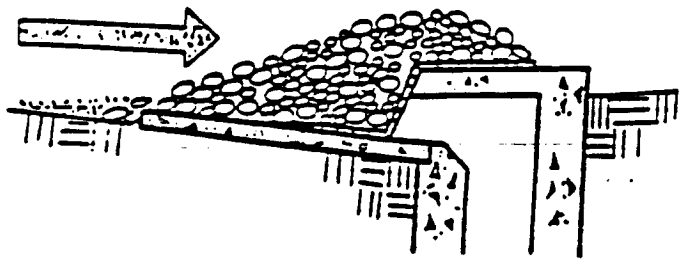
PLAN

GRAVEL FILTER BERM

ESC53

R0072322

BMP: STORM DRAIN INLET PROTECTION



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabilize Disturbed Areas
- Protect Slopes/Channels
- **Control Site Perimeter**
- **Control Internal Erosion**

GENERAL DEFINITION

Devices of various designs which detain sediment-laden runoff and allow the sediment it to settle prior to discharge into a storm drain inlet or catch basin.

SUITABLE APPLICATIONS

- Every storm drain inlet receiving sediment-laden runoff should be protected, either by covering the inlet or promoting sedimentation upstream of the inlet.

INSTALLATION/APPLICATION

- Five types of inlet protection are presented below, however, it is recognized that other effective methods and proprietary device, exist and may be selected:
  - Filter Fabric Fence: Appropriate for drainage basins less than one acre with less than a 5 percent slope.
  - Block and Gravel Filter: Appropriate for flows greater than 0.5 cfs.
  - Gravel and Wire Mesh Filter: Used on curb or drop inlets where construction equipment may drive over the inlet.
  - Sand bag barrier: Used to create a small sediment trap upstream of inlets on sloped, paved streets.
  - Excavated Drop Inlet Sediment Trap: An excavated area around the inlet to trap sediment (see Sediment Trap ESC 55).
- Select the appropriate type of inlet protection and design as referred to or as described in this fact sheet.
- Use only for drainage areas smaller than one acre unless a sediment trap first intercepts the runoff.
- Provide area around the inlet for water to pond without flooding structures and property.

REQUIREMENTS

- Maintenance
  - Inspect weekly and after each rain.
  - Replace clogged filter fabric or stone filters immediately.
  - Remove sediment when depth exceeds half the height of the filter, or half the depth of the sediment trap.
  - Remove as soon as upstream soils are stabilized and streets are swept.
- Cost (source: EPA, 1992)
  - Average annual cost for installation and maintenance (1 year useful life) is $150 per inlet.

R0072323

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ○ Toxic Materials
- ○ Oil & Grease
- ◒ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ◒ Capital Costs
- ○ O&M Costs
- ◒ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

● High ○ Low

ESC54

Best Management Practices

16 - 120

Additional Information — Storm Drain Inlet Protection

Storm drain inlet protection consists of a sediment filter or an impounding area around or upstream of a storm drain, drop inlet, or curb inlet. This erosion and sedimentation control BMP prevents excessive sediment from entering storm drainage systems prior to permanent stabilization of the disturbed area.

All on-site storm drain inlets should be protected. Off-site, inlets should be protected in areas where construction activity tracks sediment onto paved areas or where inlets receive runoff from disturbed areas.

Installation/Aplication Criteria

Planning

Large amounts of sediment may enter the storm drain system when storm drains are installed before the upslope drainage area is stabilized, or where construction is adjacent to an existing storm drain. In cases of extreme sediment loading, the storm drain itself may clog and lose a major portion of its capacity. To avoid these problems, it is necessary to prevent sediment from entering the system at the inlets.

Inlet control measures presented in this handbook should not be used for inlets draining more than one acre. Runoff from larger disturbed areas should be first routed through a Temporary Sediment Trap (see ESC 56). Different types of inlet protection are appropriate for different applications depending on site conditions and the type of inlet. Inlet protection methods not presented in this handbook should be approved by the local storm water management agency.

General Design and sizing criteria:

- Grates and spaces around all inlets should be sealed to prevent seepage of sediment-laden water.
- Excavate sediment sumps (where needed)1 to 2 feet with 2:1 side slopes around the inlet.

Installation procedures for filter fabric fence:

a. Place 2 inch by 2 inch wooden stakes around the perimeter of the inlet a maximum of 3 feet apart and drive them at least 8 inches into the ground. The stakes must be at least 3 feet long.
b. Excavate a trench approximately 8 inches wide and 12 inches deep around the outside perimeter of the stakes.
c. Staple the filter fabric (for materials and specifications, see Silt Fence ESC 50) to wooden stakes so that 32 inches of the fabric extends out and can be formed into the trench. Use heavy-duty wire staples at least one inch in length.
d. Backfill the trench with 3/4 inch or less washed gravel all the way around.

Installation procedure for block and gravel filter:

a. Place hardware cloth or comparable wire mesh with one-half inch openings over the drop inlet so that the wire extends a minimum of 1 foot beyond each side of the inlet structure. If more than one strip is necessary, overlap the strips. Place filter fabric over the wire mesh.
b. Place concrete blocks lengthwise on their sides in a single row around the perimeter of the inlet, so that the open ends face outward, not upward. The ends of adjacent blocks should abut. The height of the barrier can be varied, depending on design needs, by stacking combinations of blocks that are 4 inches, 8 inches, and 12 inches wide. The row of blocks should be at least 12 inches but no greater than 24 inches high.
c. Place wire mesh over the outside vertical face (open end) of the concrete blocks to prevent stone from being washed through the blocks. Use hardware cloth or comparable wire mesh with one half inch openings.
d. Pile washed stone against the wire mesh to the top of the blocks. Use 3/4 to 3 inch gravel.

Installation procedure for gravel and wire mesh filters:

a. Place wire mesh over the drop inlet so that the wire extends a minimum of 1 foot beyond each side of the inlet structure. Use hardware cloth or comparable wire mesh with one-half inch openings. If more than one strip of mesh is necessary, overlap the strips. Place filter fabric over wire mesh.

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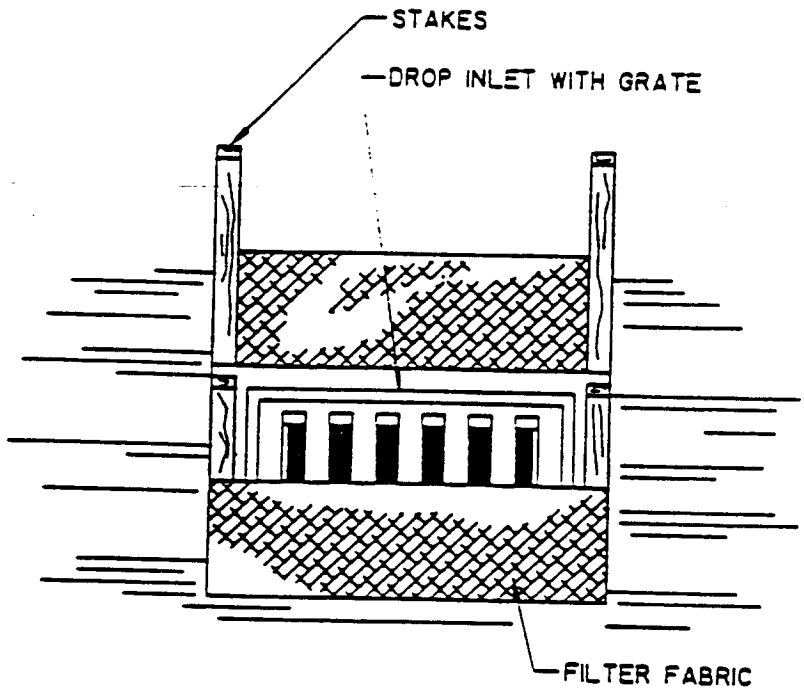
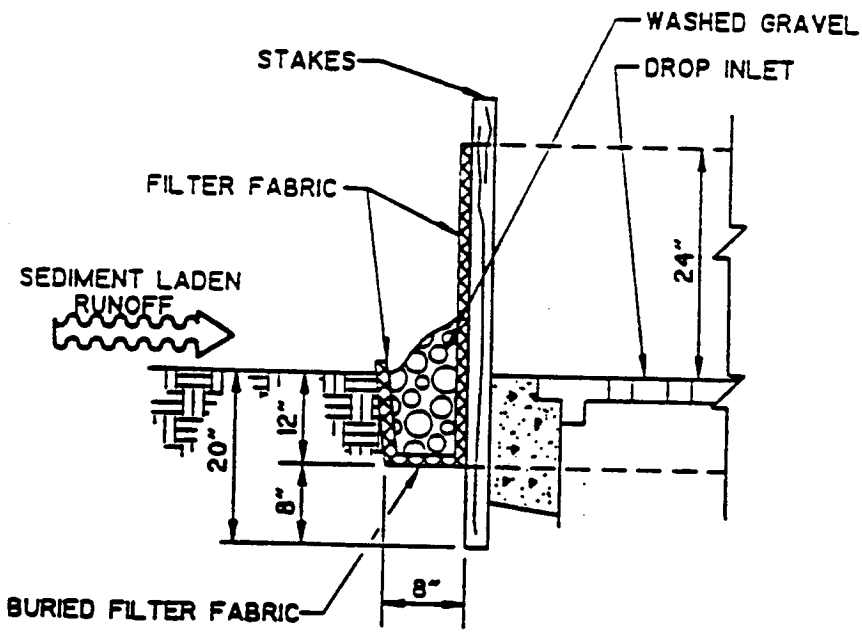
R0072324

16 - 122

Additional Information — Storm Drain Inlet Protection



ELEVATION



PROFILE

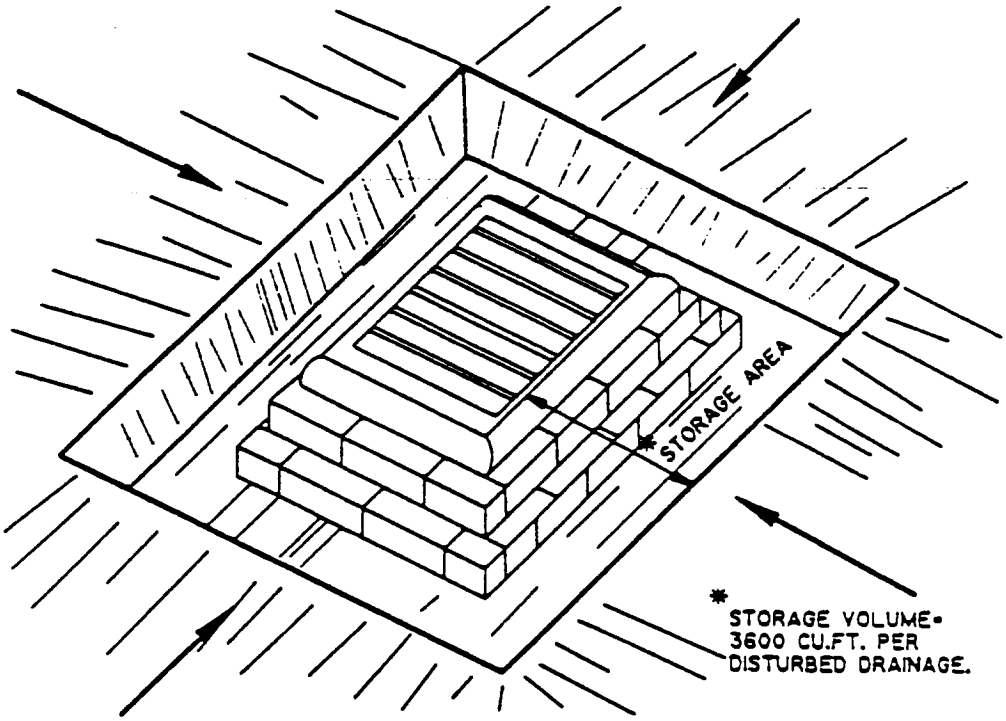
FILTER FABRIC FENCE DROP INLET FILTER

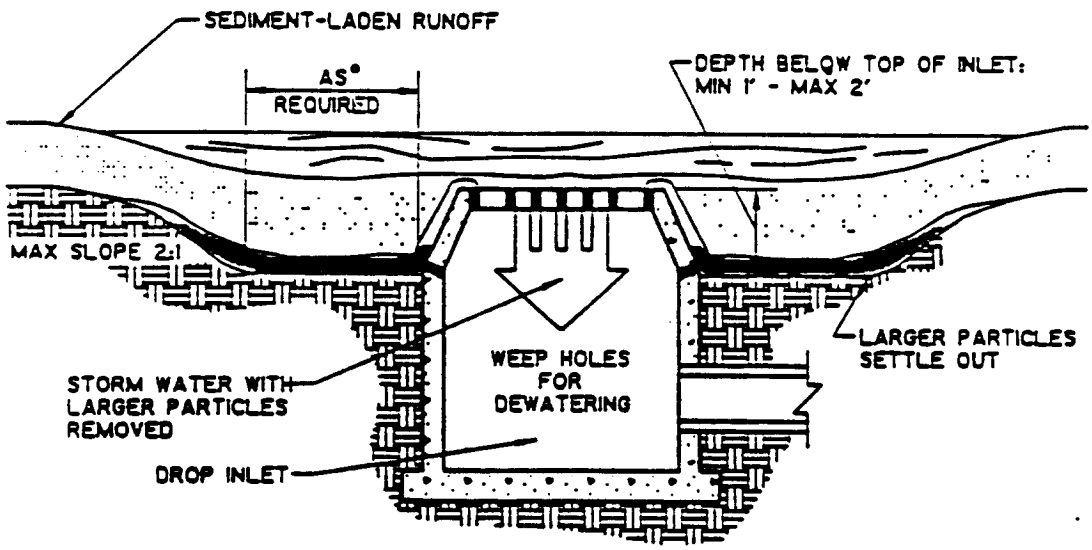
ESC54

R0072325

16-124

Additional Information — Storm Drain Inlet Protection





SPECIFIC APPLICATION

THIS METHOD OF INLET PROTECTION IS APPLICABLE WHERE HEAVY FLOWS ARE EXPECTED AND WHERE AN OVERFLOW CAPABILITY AND EASE OF MAINTENANCE ARE DESIRABLE.

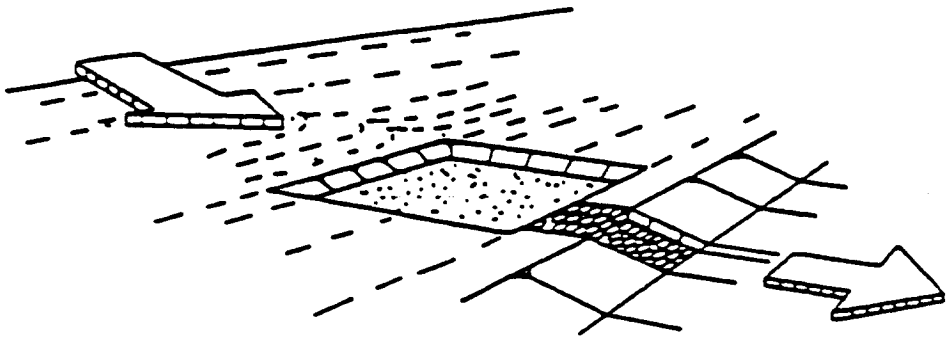
EXCAVATED DROP INLET SEDIMENT TRAP

ESC54

R0072326

16-126

BMP: SEDIMENT TRAP



Objectives

- Housekeeping Practices
- Contain Waste
- Minimize Disturbed Areas
- Stabalize Disturbed Areas
- Protect Slopes/Channels
- Control Site Perimeter
- Control Internal Erosion

GENERAL DEFINITION

A sediment trap is a small, excavated or bermed area where runoff from small drainage areas is detained and sediment can settle.

SUITABLE APPLICATIONS

- Any disturbed area less than 5 acres. (Sediment Basins, ESC56, must be used for drainage areas greater than 5 acres).
- Along the perimeter of the site at locations where sediment-laden runoff is discharged off-site.
- Around and/or upslope from storm drain inlet protection measures.
- At any point within the site where sediment-laden runoff can enter stabilized or natural areas or waterways.

INSTALLATION/APPLICATION CRITERIA

- Build outside the area to be graded before clearing, grubbing, and grading begin.
- Locate where the trap can be easily cleared of sediment.
- Trap size depends on the type of soil, size of the drainage area, and desired sediment removal efficiency.
- The larger the trap, the less frequently sediment must be removed.
- The outlet of the trap must be stabilized with rock, vegetation, or another suitable material.
- A stable emergency spillway must be installed to safely convey major floods (see your local flood control agency).

REQUIREMENTS

- Maintenance
  - Remove sediment when the sediment storage zone is no more than 1 ft. from being full.
  - Inspect weekly and after each rain.
- Cost (source: EPA, 1992)
  - Average annual cost per installation and maintenance (18 month useful life) is $0.70 per $ft.^3$ ($1,300 per drainage acre).

LIMITATIONS

- Only use for drainage areas up to 5 acres (see Sedimentation Basin BMP ST8 for larger areas).
- Only removes coarse sediment (medium silt size and larger) unless sized like a sedimentation basin.

R0072327

Targeted Pollutants

- ● Sediment
- ○ Nutrients
- ◒ Toxic Materials
- ○ Oil & Grease
- ○ Floatable Materials
- ○ Other Construction Waste

- ● Likely to Have Significant Impact
- ○ Probable Low or Unknown Impact

Implementation Requirements

- ○ Capital Costs
- ◒ O&M Costs
- ○ Maintenance
- ○ Training
- ○ Suitability for Slopes >5%

● High ○ Low

ESC 55

Best Management Practices

16-128

Additional Information — Sediment Trap

3. The trap is removed and the area stabilized when the upslope drainage area has been properly stabilized.
4. All cut-and-fill slopes should be 3:1 or flatter.
5. When a riser is used, all pipe joints must be watertight.
6. When a riser is used, at least the top two-thirds of the riser shall be perforated with 1/2-inch diameter holes spaced 8 inches vertically and 10 to 12 inches horizontally. (See Sediment Basin, ESC56)
7. When an earth or stone outlet is used, the outlet crest elevation should be at least 1 foot below the top of the embankment.
8. When a crushed stone outlet is used, the crushed stone used in the outlet should meet AASHTO M43, size No. 2 or 24, or its equivalent such as MSHA No. 2. Gravel meeting the above gradation may be used if crushed stone is not available.

REFERENCES

Best Management Practices and Erosion Control Manual for Construction Sites, Flood Control District of Maricopa County, Rough Draft - July 1992.

"Draft - Sedimentation and Erosion Control, An Inventory of Current Practices", U.S.E.P.A., April, 1990.

"Environmental Criteria Manual", City of Austin, Texas.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, June 1981.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group Working Paper, USEPA, April, 1992.

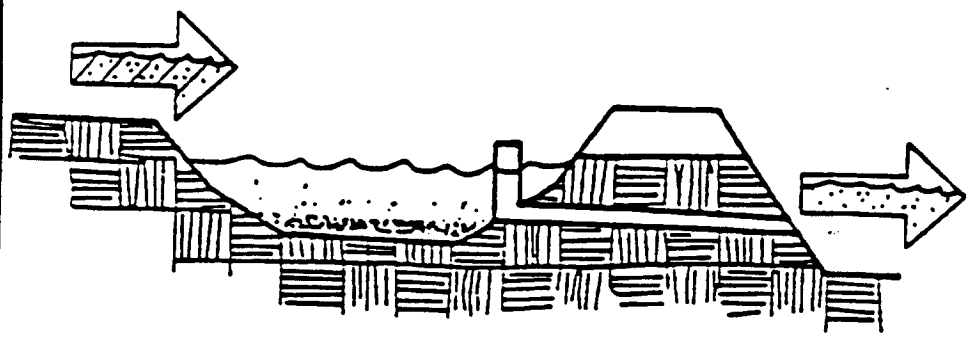
Stormwater Management Water for the Puget Sound Basin, Washington State Department of Ecology, The Technical Manual - February 1992, Publication # 91-75.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency - November 1988.

ESC55

R0072328

BMP: SEDIMENT BASIN



Objectives

- *Housekeeping Practices*
- *Contain Waste*
- *Minimize Disturbed Areas*
- *Stabalize Disturbed Areas*
- *Protect Slopes/Channels*
- *Control Site Perimeter*
- *Control Internal Erosion* (●)

GENERAL DEFINITION

A pond created by excavation or constructing an embankment, and designed to retain or detain runoff sufficiently to allow excessive sediment to settle.

SUITABLE APPLICATIONS

- At the outlet of all disturbed watershed 10 acres or larger.
- At the outlet of smaller disturbed watersheds, as necessary.
- Where post construction detention basins will be located.
- Should be used in association with dikes, temporary channels, and pipes used to divert disturbed areas into the basin and undisturbed areas around the basin.

INSTALLATION/APPLICATION

- Construct before clearing and grading work begins.
- Do not locate in a stream.
- All basin sites should be located where failure of the embankment would not cause loss of life/property damage.
- Large basins are subject to state/local dam safety requirements.
- Securely anchor and install an anti-seep collar on the outlet pipe/riser, and provide an emergency spillway for passing major floods (see local flood control agency).
- The basin volume should be sized to capture runoff from a 2-year, 24-hour storm, or other appropriate design storms specified by the local agency. A detention time of 24 to 40 hours should allow 70 to 80 percent of sediment to settle.
- The basin volume consists of two zones:
  - A sediment storage zone at least 1 foot deep.
  - A settling zone at least 2 feet deep.
- The length to settling depth ratio (L/SD) should be less than 200.
- The length to width ratio should be greater than 6:1, or baffles are required to prevent short circuiting.

REQUIREMENTS

- Maintenance
  - Inspect weekly and after each rain.
  - Remove sediment where the sediment storage zone is half full.
- Cost: Average annual cost for installation and maintenance (2 year useful life, source: EPA, 1992)
  - Basin less than 50,000 $ft.^3$: $0.40 per $ft.^3$ ($700 per drainage acre)
  - Basin size greater than 50,000 $ft.^3$: $0.20 per $ft.^3$ ($350 per drainage acre)

R0072329

Targeted Pollutants

- ● *Sediment*
- ○ *Nutrients*
- ◒ *Toxic Materials*
- ○ *Oil & Grease*
- ○ *Floatable Materials*
- ○ *Other Construction Waste*

- ● *Likely to Have Significant Impact*
- ○ *Probable Low or Unknown Impact*

Implementation Requirements

- ○ *Capital Costs*
- ◒ *O&M Costs*
- ○ *Maintenance*
- ○ *Training*
- ○ *Suitability for Slopes >5%*

● *High* ○ *Low*

ESC56

Best Management Practices



CKE RESTAURANTS
1200 N. HARBOR BLVD. P.O. BOX 4349
ANAHEIM, CALIFORNIA 92803-4349
714-774-5796 • FAX 714-778-7183

April 2, 1999

Xavier Swamikannu
Los Angeles Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Xavier:

Thank you for sending the list of recommended Best Management Practices (BMPs) for the Storm Water Program. Attached is the Restaurant Standard Urban Storm Water Mitigation Plan and our comments referencing those BMPs only. I will attend the April 22 hearing for considering these BMPs, and I will provide oral testimony as well.

If you or the Board wish to call me regarding these written comments, you can reach me at 714-778-7150. Thank you for the opportunity to provide the quick service restaurant point of view on this important issue.

Sincerely,

Michael Kissel
Environmental Health Compliance Specialist
CKE Restaurants, Inc.

C: Carl Arena
Suzi Brown
LeRoy Russ
Tom Wilhelm
Robert Wilson
Ron Wennerberg

R0072330

CKE Restaurants, Inc. Comments
for
RESTAURANT
STANDARD URBAN STORM WATER MITIGATION PLAN

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

The installation of a self-contained structure with pretreatment equipment for a sanitary sewer discharge in most free-standing quick service restaurants (QSRs) would have to be incorporated into the outdoor trash enclosure. According to the proposed plan, this would require a roof structure. Since such a structure would significantly increase the cost of new restaurants, it is recommended that each site be given the opportunity for conditional waiver for a cover if that site can demonstrate effective Best Management Practices in keeping the area clean.

2. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Stenciling of storm drain inlets, channels, creeks and catch basins are a responsibility of the municipality or county in unincorporated areas. These areas are outside the jurisdiction of most businesses.

3. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

These structures would, again, apply to QSRs with trash enclosures. Berms and dikes would interfere with the access to the trash containers. A sloped pavement in the enclosure would prevent materials from escaping the area. It is also recommended that a conditional waiver be given to these structures for coverings as well.

4. PROPERLY DESIGN TRASH STORAGE AREAS

See comments for BMPs 1 and 3.

5. CONSIDER ROOFTOP RUNOFF TREATMENT

Since exhaust system cleaning services are the primary contributors of rooftop runoff, they should be required to provide BMPs for mitigation of this problem. With the installation of catalytic converters required by the South Coast AQMD for chain-driven charbroilers, the accumulation of rooftop pollutants form cooking exhaust is no longer an issue.

6. CONTROL PARKING LOT RUNOFF

It is recommended that products claiming to mitigate this runoff be researched and presented to industry. We have not seen a product that can properly filter the volume of water involved in this operation. Infiltration trenches, parking grooves, vegetated swales and landscape islands do not remove the materials from waster steam or they deposit them into the soil impacting the groundwater.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Any documentation of any kind of BMP maintenance should be kept to a minimum. Extensive documentation would be burdensome to QSRs.

RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

GOALS

- Prevent potential pollutants from entering the storm drain system and ultimately impacting receiving waters.
- Reduce amount of runoff.
- Eliminate non-stormwater discharges to the storm drains.

REQUIREMENTS

Developers and/or owners will be required to incorporate Best Management Practices (BMPs) 1 through 7 into project plans and designs. Where the developer and/or owner believes that a BMP is not appropriate or applicable to a specific project, the developer will be required to provide an explanation.

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved and have secondary containment.

2. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating

5. CONSIDER ROOFTOP RUNOFF TREATMENT

Rooftop runoff has the potential to transport toxic compounds, oil and grease, bacteria, and suspended solids. Consideration should be given to implementing the following techniques for treating runoff from individual building rooftops and allowing it to infiltrate into the soil (See Table 1: Suggested Resources for additional sources of information):

- Dry-wells
- Cisterns
- Foundation planting
- Permeable areas near buildings

6. CONTROL PARKING LOT RUNOFF

Parking lots have the potential to contribute oil and grease, trash, heavy metals, and suspended solids to the stormwater conveyance system. Consideration should be given to implementing the following structural BMPs to both reduce the impervious land coverage of parking areas and to filter runoff before it reaches the storm drain system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and landscape islands
- Infiltration trenches
- Oil/Water separators and water quality inlets
- Media filtration
- Bioretention facility
- Hybrid lots
- Parking groves
- Permeable overflow parking

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

R0072334

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640
Internet Address: http://www.swrcb.ca.gov/~rwqcb4

Gray Davis
Governor

June 14, 1999

Terri Grant
Environmental Programs
County of Los Angeles,
Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91802-1460

LOS ANGELES COUNTY MUNICIPAL STORM WATER PROGRAM - APPROVING BEST MANAGEMENT PRACTICES (BMPs) FOR DEVELOPMENT PLANNING AND CONSTRUCTION (Board Resolution No. 99-03)

Dear Ms. Grant:

On April 22, 1999, the Regional Board at its hearing adopted Board Resolution No. 99-03 approving the List of BMPs for use in Development Planning/ Development Construction model programs. A copy of the Resolution and Approved BMPs (Attachments 1, 2, and 3) are attached.

The List of BMPs is now part of the Development Planning/ Development Construction model programs approved by the Executive Officer. Please update these model programs appropriately.

If you have any questions, please call me at (213) 576-6654.

Sincerely,

Xavier Swamikannu, D.Env.
Municipal Storm Water Program

Enclosures

Cc: Los Angeles County Municipal Storm Water Permittees
Interested Parties on List

R0072335

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION

Resolution No. 99-03

APPROVING BEST MANAGEMENT PRACTICES
FOR
MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS
IN
LOS ANGELES COUNTY

(NPDES NO. CAS614001)

WHEREAS, THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FINDS:

1. Pursuant to the requirements of Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles (Permit), the Principal Permittee, in consultation with the Co-Permittees, has developed model programs for Development Construction and Development Planning. These programs must include Best Management Practices (BMPs) to control/ minimize the discharge of pollutants to receiving waters.

2. The Permit requires that the Regional Board approve these BMPs, to be part of the Development Planning and Development Construction Model Program, before implementation by Permittees.

3. The Lists of BMPs have been evaluated and are considered appropriate practices for the respective programs/ activity.

4. This Resolution adopts a master list of BMPs for Development Planning and Development Construction Projects in Los Angeles County. These BMPs when implemented at development projects, in combination, will reduce pollutants in storm water discharges to the "maximum extent practicable".

THEREFORE BE IT RESOLVED THAT:

1. The Best Management Practices contained in the following Attachments are approved:

   a. Attachment 1 - Development Planning
   b. Attachment 2 - Development Construction
   c. Attachment 3 – Supplementary List of BMPs

2. The Permittees shall select and require implementation of the most effective BMPs, approved and attached hereto (and as may hereafter be updated) for storm water/ urban runoff pollution control benefits.

R0072336

3. The Regional Board Executive Officer is hereby authorized to update the master list and to incorporate additional detail to the BMPs as necessary.

I, Dennis Dickerson, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on April 22, 1999.

DENNIS A. DICKERSON
Executive Officer

Date: April 22, 1999

ATTACHMENT 1

Recommended BMPs for Site Planning, Post-Construction, and Redevelopment/Infill

Site Planning BMPs
Minimize Storm Water Runoff
Pervious Drainage System
Reduce Area of Impervious Surface
Site Layout

Post-Construction BMPs	
BMP Name	**BMP Identification No. and Name [a]**
Car Wash Facility	SC3, Vehicle and Equipment Washing and Steam Cleaning
Constructed Wetlands	TC3, Constructed Wetlands
Control of Impervious Runoff	Not applicable.
Efficient Irrigation	Not applicable.
Energy Dissipaters	ESC40, Outlet Protection
Extended Detention Basins	TC5, Extended Detention Basin
Infiltration Basins	TC1, Infiltration
Infiltration Trenches	TC1, Infiltration
Inlet Trash Racks	Not applicable.
Landscape Design	ESC2, Preservation of Existing Vegetation; ECS10, Seeding and Planting; ESC11, Mulching
Linings for Urban Runoff Conveyance Channels	Not applicable.
Materials Management	SC5, Outdoor Loading/Unloading of Materials; SC6, Outdoor Container Storage of Liquids; SC8, Outdoor Storage of Raw Materials, Products, and By-Products
Media Filtration	TC6, Media Filtration
Motor Fuel Concrete Dispensing Areas	SC2, Vehicle and Equipment Fueling
Motor Fuel Dispensing Area Canopy	SC2, Vehicle and Equipment Fueling
Oil/Water Separators and Water Quality Inlets	TC7, Oil/Water Separators and Water Quality Inlets
Outdoor Storage	SC6, Outdoor Container Storage of Liquids; SC8, Outdoor Storage of Raw Materials, Products, and By-Products
Porous Pavement and Alternative Surfaces	TC1, Infiltration
Protect Slopes and Channels	ECS40, Outlet Protection; ESC42, Slope Roughening and Terracing
Self-Contained Areas for Vehicle or Equipment Washing, Steam Cleaning, Maintenance, Repair, or Material Processing	SC3, Vehicle and Equipment Washing and Steam Cleaning; SC4, Vehicle and Equipment Maintenance and Repair; SC7, Outdoor Process Equipment Operations and Maintenance
Storm Drain System Stenciling and Signage	SC30, Storm Drain System Signs
Trash Container Areas	SC9, Waste Handling and Disposal
Vegetated Swales and Strips	TC4, Bio-filters
Wet Pond	TC2,Wet Pond

R0072339

[a] Corresponds to the BMP number and name as in the *California Storm Water Best Management Practice Handbooks* (1993).

Redevelopment and Infill BMPs	
BMP Name	**BMP Identification No. and Name [a]**
Car Wash Facilities	SC3, Vehicle and Equipment Washing and Steam Cleaning
Control of Impervious Runoff	Not applicable.
Efficient Irrigation	Not applicable.
Energy Dissipaters	ESC40, Outlet Protection
Landscape Design	ESC2, Preservation of Existing Vegetation; ECS10, Seeding and Planting; ESC11, Mulching
Linings for Urban Runoff Conveyance Channels	Not applicable.
Materials Management	SC5, Outdoor Loading/Unloading of Materials; SC6, Outdoor Container Storage of Liquids; SC8, Outdoor Storage of Raw Materials, Products, and By-Products
Media Filtration	TC6, Media Filtration
Motor Fuel Concrete Dispensing Areas	SC2, Vehicle and Equipment Fueling
Motor Fuel Dispensing Area Canopy	SC2, Vehicle and Equipment Fueling
Oil/Water Separators and Water Quality Inlets	TC7, Oil/Water Separators and Water Quality Inlets
Outdoor Storage	SC6, Outdoor Container Storage of Liquids; SC8, Outdoor Storage of Raw Materials, Products, and By-Products
Porous Pavement and Alternative Surfaces	TC1, Infiltration
Protect Slopes and Channels	ECS40, Outlet Protection; ESC42, Slope Roughening and Terracing
Self-Contained Areas for Vehicle or Equipment Washing, Steam Cleaning, Maintenance, Repair, or Material Processing	SC3, Vehicle and Equipment Washing and Steam Cleaning; SC4, Vehicle and Equipment Maintenance and Repair; SC7, Outdoor Process Equipment Operations and Maintenance
Storm Drain System Stenciling and Signage	SC30, Storm Drain System Signs
Trash Container Areas	SC9, Waste Handling and Disposal
Vegetated Swales and Strips	TC4, Bio-filters

[a] Corresponds to the BMP number and name as in the *California Storm Water Best Management Practice Handbooks* (1993).

R0072340

ATTACHMENT 2

Recommended Best Management Practices

for

Development Construction

R0072341

Attachment 2

STORMWATER POLLUTION CONTROLS FOR CONSTRUCTION ACTIVITIES

Stormwater Best Management Practices	BMP No. [1]	Categories of Activities																					
		Site Preparation/ Earthmoving		Construction of Underground Structures				Construction of Above Ground Structures				Construction of Roadways, Walkways & Parking Lots			Waterways					Planting & Landscaping			
		Clearing & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvement	Water & Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
General Site Management																							
Construction Practices																							
Dewatering Operations	CA01		X	X	X	X	X								X	X	X	X	X				
Paving Operations	CA02											X	X	X	X		X	X					
Structure Construction & Painting	CA03			X			X	X	X	X	X						X	X	X				
Vehicle & Equipment Management																							
Vehicle & Equipment Cleaning	CA30	X	X	X	X	X	X					X	X	X					X				
Vehicle & Equipment Fueling	CA31	X	X	X	X	X	X					X	X	X					X				
Vehicle & Equipment Maintenance	CA32	X	X	X	X	X	X					X	X	X					X				
Contractor Training																							
Employee/Subcontractor Training	CA40	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Construction Materials & Waste Management [2]																							
Material Management																							
Material Delivery & Storage	CA10			X	X			X	X	X	X	X	X	X	X		X	X	X		X	X	X
Material Use	CA11			X	X			X	X	X	X	X	X	X	X		X	X	X		X	X	X
Spill Prevention & Control	CA12									X	X		X										
Waste Management																							
Solid Waste Management	CA20	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hazardous Waste Management	CA21									X	X	X	X										
Contaminated Soil Management	CA22	X	X	X	X	X	X								X	X							
Concrete Waste Management	CA23			X	X		X			X		X			X		X	X		X			
Sanitary/Septic Waste Management	CA24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

(1) Numbers refer to California Best Management Practices Handbook (See Appendix H)
(2) Some practices are also covered under other regulatory programs. See BMP fact sheets in Appendix H for details.

R0072342

Attachment 2

STORMWATER POLLUTION CONTROLS FOR CONSTRUCTION ACTIVITIES

Stormwater Best Management Practices	BMP No. (1)	Categories of Activities																					
		Site Preparation/ Earthmoving		Construction of Underground Structures				Construction of Above Ground Structures				Construction of Roadways, Walkways & Parking Lots			Waterways					Planting & Landscaping			
		Clearing & Grubbing	Earthwork	Foundations	Conduits (Open Cut)	Drilling	Tunnels	Wood Frame	Structural Steel	Masonry & Concrete	Roofing & Coating	Concrete	Asphalt	Base & Subgrade	Channel Improvement	Water & Sediment Impoundment	Over Crossing	Under Crossing	Waterfront Construction	Irrigation Facilities	Seeding & Sodding	Mulching	Planting
Erosion Control																							
Site Plannning Considerations																							
Scheduling	ESC01	X	X		X							X	X	X	X	X	X	X	X	X	X	X	X
Preservation of Existing Vegetation	ESC02	X	X		X		X					X	X	X	X	X	X	X	X	X		X	
Vegetation Stabilization																							
Temporary Seeding & Planting	ESC10	X	X												X	X	X		X				
Temporary Mulching	ESC11	X	X												X	X	X		X				
Physical Stabilization																							
Geotextiles & Mats	ESC20	X	X												X	X	X	X	X				
Dust Control	ESC21	X	X		X							X	X	X	X	X	X	X	X	X	X	X	X
Tempory Stream Crossing	ESC22	X	X	X	X	X	X	X	X					X	X	X	X	X		X	X	X	X
Construction Road Stabilization	ESC23	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Diversion of Runoff																							
Earth Dike	ESC30	X	X		X										X	X		X	X		X	X	
Temporary Drains & Swales	ESC31	X	X		X										X	X		X	X				
Slope Drain	ESC32	X	X		X										X	X		X	X				
Velocity Reduction																							
Outlet Protection	ESC40	X	X		X										X	X			X				
Check Dams	ESC41	X	X		X										X	X			X				
Slope Roughening/Terracing	ESC42	X	X		X										X	X			X				
Sediment Control																							
Silt Fence	ESC50	X	X		X										X	X		X	X				
Straw Bale Barrier	ESC51	X	X		X										X	X		X	X				
Sand Bag Barrier	ESC52	X	X		X										X	X		X	X				
Brush or Rock Filter	ESC53	X	X		X										X	X		X	X				
Storm Drain Inlet Protection	ESC54	X	X		X										X	X		X	X				
Sediment Trap	ESC55	X	X		X										X	X		X	X				
Sediment Basin	ESC56	X	X		X										X	X		X	X				
Stabilized Construction Entrance	ESC24	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

(1) Numbers refer to California Best Management Practices Handbook (See Appendix H).
(2) Some practices are also covered under other regulatory programs. See BMP fact sheets in Appendix H for details.

R0072343

ATTACHMENT 3

DEVELOPMENT PLANNING / CONSTRUCTION BMPs

BMP Name	BMP Identification No. and Name
Non-storm water discharges elimination	SC1, Eliminate non-storm water discharges to the storm drain collection system
Material storage management	SC20, Material storage control – Design site with bermed and covered storage areas for material storage located away from storm drains
Aboveground Tank Berms	SC41, Aboveground Tank Berms
Multiple treatment systems in combination	TC8, Multiple treatment systems in combination
Detention/ Infiltration device maintenance	SC75, Has the developer/ owner determined how detention/ infiltration devices planned for the site will be maintained
Geotextiles and Mats	ESC20, Geotextiles and Mats
Scheduling	ESC1, Scheduling activity
Outdoor Process Equipment Operation and Maintenance	SC7, Outdoor Process Equipment Operation and Maintenance – Design site to inlcude a canopy over outdoor processes
Illicit Connection Prevention	SC60, Illicit Connection Prevention – Will any planned connections to the storm drain carry non-storm water discharges.
Catch basin insert	Catch basin insert
Catch-basin screen	Catch-basin screen
Continuous flow deflection/ separation systems	Continuous flow deflection/ separation systems
Normal flow separation/ storage systems	Normal flow separation/ storage systems
Cistern collection systems	Cistern collection systems
Clarifiers	Clarifiers
Primary waste-water treatment systems	Primary treatment
Secondary waste-water treatment systems	Secondary treatment
Facility design to divert wash-off to sanitary sewers	Sanitary sewer diversion
Drip Irrigation systems	Drip Irrigation
Pesticide and fertilizer use elimination or reduction	Pesticide and Fertilizer use management
Vacuum sweeping of parking lots	Vacuum sweeping
Flow diversion to landscape or pervious areas	Flow diversion for infiltration
Curb elimination on landscaped areas	Curb elimination
Vegetated buffer zones	Vegetated buffer zones
Post signs to caution improper practices or to educate	Signage
Retention grading	Retention grading
Filtration systems	Filtration systems

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

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Phone (213) 576-6600 FAX (213) 576-6640
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Gray Davis
Governor

March 8, 2000

Harry Stone
Director of Public Works,
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91802-1460

Ray Holland
Director of Public Works, City of Long Beach
333 West Ocean Boulevard
Long Beach, CA 90802

STANDARD URBAN STORM WATER MITIGATION PLANS AND BOARD RESOLUTION APPROVING POST-CONSTRUCTION BMP REQUIREMENTS FOR DEVELOPMENT PLANNING AND CONSTRUCTION (Board Resolution No. R-00-02)

Dear Mr. Stone and Mr. Holland:

On January 26, 2000, the Regional Board at its hearing adopted Board Resolution No. R-00-02 directing me to approve the Standard Urban Storm Water Mitigation Plan (SUSMP) with changes noted. The Regional Board at the same time also adopted the SUSMP requirements for the City of Long Beach under the City of Long Beach municipal separate storm sewer system (MS4) permit (Board Order No. 99-060).

Copies of the Regional Board Executive Officer approved SUSMP, Board Directed Changes - Supplement, and the Resolution adopted by the Regional Board are attached.

The City of Long Beach and all Los Angeles County Municipal Storm Water Permittees will have until September 8, 2000, to promulgate ordinances or amend municipal codes to implement the SUSMP requirements. The SUSMP requirements shall take effect no later than October 8, 2000. All parties, including the City of Long Beach, will have 30 days from the date of this letter to file a review of the action by the State Water Resources Control Board.

If you have any questions, please call me at (213) 576-6605 or Dr. Swamikannu at (213) 576-6654.

Sincerely,

Dennis A. Dickerson
Executive Officer

Cc: Permittees
Interested Parties

R0072345

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION

Resolution No. R-00-02

APPROVING THE
STANDARD URBAN STORM WATER MITIGATION PLAN
FOR
MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS
IN LOS ANGELES COUNTY

WHEREAS, THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FINDS:

1. On July 15, 1996, a municipal separate storm sewer system permit (Los Angeles County MS4 Permit) was issued to the County of Los Angeles and 85 incorporated cities to control and minimize the discharge of pollutants associated with storm water and urban runoff. This permit became Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles.

2. On June 30, 1999, a municipal storm water permit was issued to the City of Long Beach (City of Long Beach MS4 Permit) which removed the City of Long Beach from Board Order No. 96-054, giving the City of Long Beach its own distinct Municipal Storm Water and Urban Runoff NPDES permit, Regional Board Order No. 99-060, "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the City of Long Beach".

3. On August 19, 1999, a statewide general storm water permit for construction activity (Statewide Construction Storm Water Permit) was adopted by the State Water Resources Control Board (State Board). This permit became State Board Order No. 99-08-DWQ, and applies to construction projects that disturbs five acres or more or is part of a larger common plan of sale in the Los Angeles region.

4. Many of the rivers and streams in Los Angeles County are formally designated as impaired, pursuant to Section 303 (d) of the federal Water Pollution Control Act, for specific pollutants that are commonly found in storm water and urban runoff.

5. Storm water runoff carries with it many pollutants in varying concentrations that are suspended in, and or dissolved, in the runoff. The sources of these pollutants include nearly all properties that have been developed since the pollutants originate through the many diverse activities of habitation and land use. Pollutants generated from individual property developments vary greatly in the concentration or loading of each pollutant. Generally, the relative contribution of the pollutant from runoff from any individual property development will represent only a small portion of the entire loading of a water body given the many square miles of land upon which storm water runoff is generated. When the individual contributions from tens of thousands of discrete property units are aggregated, the pollutant loading becomes significant. The resultant pollutant loads results in the impairment of that water body and the conveyance of pollutants, including sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides to the ocean and harbors within Los Angeles County. The loading of pollutants generated in the Los Angeles area are being measured through the monitoring program being conducted by the Los Angeles County Department of Public Works in conformance with its obligations as the Principal Permittee under the Los Angeles CountyMS4 Permit.

6. The nature of property use is related to the types and quantities of pollutants that are transported from that property during a rainfall event.

7. As property is developed or redeveloped, the utilization of Best Management Practices provide an opportunity to reduce the loading of pollutants to water bodies. This is accomplished by various techniques and can be passive (source reduction) or active (treatment). As property is developed from undisturbed lands, the project can be designed to incorporate Structural or Treatment Control (Best Management Practices (BMPs) that would normally not be available or practical to use on property that has been in urban use.

8. BMPs are effective means of reducing pollutants and Structural or Treatment Control BMPs can be "designed-into" a project in a cost effective way and in a manner that is either transparent to or which enhances the use to which the property has been placed. Some BMPs encourage the setting aside of areas as a greenbelt to allow storm water runoff to flow over areas which are permeable, thereby allowing all or a portion of the runoff to infiltrate. Other BMPs can be designed and built into structures such as catch basins that incorporate replaceable filters to absorb oily wastes or by installing screens to prevent litter from passing through the system and into the water body.

9. Arrays of Structural or Treatment control BMPs are available to developers of both new and redevelopment properties. The use of BMPs is already required by the terms of the Los Angeles County and Long Beach Municipal Storm Water and Urban Runoff NPDES permits.

10. The ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time. A BMP that can only be effective for a small volume of storm water runoff is inherently less effective than one sized to accommodate a larger volume of water.

11. Storm water runoff will normally convey a disproportionate loading of pollutants in the initial period runoff is generated during a storm event. Storm events generating up to 0.75 inches of precipitation, measured over a 24-hour period, constitute 85 percent of the total amount of runoff that can be expected during an average wet season. Designing a BMP to be able to accommodate this amount of runoff will result in the application of a BMP intervention to all but 15% of the total runoff during a year, and usually all of the critical runoff that occurs in the early phase of the precipitation event, commonly referred to as the "first Flush."

12. Both the Los Angeles County MS4 Permit (Part III.A.1.c) and the City of Long Beach MS4 Permits contain provisions related to the adoption of Standard Urban Storm Water Mitigation Plans (SUSMPs) requiring their development and implementation.

13. Standard Urban Storm Water Mitigation Plans are required for a specified set of enumerated projects and the permit specifically identifies seven distinct categories for which SUSMPs are required to be prepared. The permit specifically states that the seven categories of projects are the minimum categories requiring SUSMPs.

14. Standard Urban Storm Water Mitigation Plans are also required for development or redevelopment of Parking Lots 5,000 square feet or greater and Locations in Environmentally Sensitive Areas. These categories have been added to advance efforts to control storm water pollution beyond the minimum in Los Angeles County.

15. Standard Urban Storm Water Mitigation Plans are required to be approved by the Regional Board Executive Officer following which they are to be implemented by the Permittees and used by the Permittees as the minimum criteria for the approval of project specific Urban Storm Water Mitigation Plans and the issuance of grading or building permits to project applicants.

16. The Statewide Construction Storm Water Permit requires that Storm Water Pollution Prevention Plans (State SWPPPs) contain post-construction BMPs that will be implemented after construction is complete.

17. Section 402 (p) of the Clean Water Act requires the Administrator of the United States Environmental Protection Agency or her designated agent, in this instance, the Regional Board, to require as part of the storm water program "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [USC Section 1342 (p)(3)(B)].

18. A recent decision of the United States 9th Circuit Court of Appeals, *Defenders of Wildlife v. Browner* (1999) Case No. 98-71080, provides additional support and clarification of the authority of the Administrator and the Regional Board to impose additional controls on storm water pollution. The Court in *Defenders of Wildlife v. Browner* said that the USEPA and the States have discretion under the law to determine what pollution controls are appropriate to achieve compliance.

19. Pursuant to the requirements of Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, the Regional Board Executive Officer received a proposal for Standard Urban Storm Water Mitigation Plans submitted by the Principal Permittee.

20. Upon the review of the Regional Board Executive Officer, the Standard Urban Storm Water Mitigation Plan submitted for the seven applicable categories was deemed inadequate. A revised SUSMP proposal was developed subsequent to a discussion of the proposal's conceptual foundation at a public workshop held on August 10, 1999. This workshop was well attended with over 80 municipal representatives and interested parties participating.

21. On August 16, 1999, a public notice was issued indicating that the Standard Urban Storm Water Mitigation Plans proposed by the Principal Permittee would be augmented by the addition of criteria related to specifying numerical design criteria for BMP construction. The matter was noticed for the Regional Board's September meeting to allow the issue to be discussed before the Board although no formal action of the Regional Board itself is required for SUSMP approval.

22. On September 16, 1999, the Regional Board conducted a public hearing on the Standard Urban Storm Water Mitigation Plan proposal as amended by the Executive Officer. At that hearing, the Regional Board Executive Officer suggested additional time would be necessary to develop a more comprehensive proposal incorporating the comments received at the public hearing.

23. Between September 16, 1999 and January 25, 2000, the Regional Board Executive Officer met with interested parties to discuss comments and concerns from interested parties.

24. The Southern California Council of Governments (SCAG) has indicated its interest in obtaining funding to prepare a regional plan(s) to address storm water pollution and identify regional treatment solutions for implementation.

25. On December 7, 1999, the Regional Board Executive Officer released a revised Standard Urban Storm Water Mitigation Plan document to interested parties.

THEREFORE BE IT RESOLVED THAT:

1. The Regional Board endorses the Standard Urban Storm Water Mitigation Plan prepared by the Regional Board Executive Officer and noticed to the public on December 7, 1999 and the concepts therein relating to numerical storm water mitigation standards for Best Management Practices; and

2. The Regional Board directs the Regional Board Executive Officer to approve the Standard Urban Storm Water Mitigation Plan at the earliest opportunity incorporating changes made and formally approved by the Regional Board at the January 26, 1999 Board Hearing;

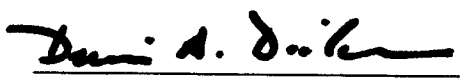
3. The Regional Board adopts the approved requirements as provisions applicable to the SUSMP requirements for the City of Long Beach.

4. The Regional Board adopts the numerical mitigation standards for storm water, endorsed herein, as the minimum design criteria for review of post-construction BMPs in the Los Angeles Region for construction projects subject to coverage under the Statewide Construction Storm Water Permit.

5. The Regional Board encourages the Permittees and all interested parties to work together in a spirit of cooperation to effect the implementation of the Standard Urban Storm Water Mitigation Plan at the earliest possible date, and

6. The Regional Board encourages the efforts by the Southern California Council of Governments and area Council of Governments (COGs) to develop regional plans and identify regional solutions to address storm water pollution from new development and redevelopment.

I, Dennis Dickerson, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 26, 2000.



DENNIS A. DICKERSON
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

STAFF REPORT AND RECORD OF DECISION

STANDARD URBAN STORM WATER MITIGATION PLANS

AND

NUMERICAL DESIGN STANDARDS FOR BEST MANAGEMENT PRACTICES

SUPPLEMENT

BOARD DIRECTED CHANGES

The Regional Board at its January 26, 2000, meeting directed the Regional Board Executive Officer to amend the Standard Urban Storm Water Mitigation Plans (SUSMPs) as indicated by the change sheet presented at the meeting (dated January 25, 2000), and changes directed by the Regional Board during the meeting. The Regional Board also adopted the same SUSMP requirements for the City of Long Beach under its separate municipal storm water permit (Board Order No. 99-060) for project categories that require SUSMPs.

Regional Board Counsel designated the record for the proceeding to include: (i) all staff files and the transcript of proceedings for the January 26, 2000, Hearing; (ii) all staff files and transcript of proceedings for the September 16, 1999, Board Information Item Discussion; (iii) all staff files for the August 10, 1999, Workshop, (iv) all SUSMP Proposals circulated by the Permittees, (v) all SUSMP Proposals circulated by the Regional Board Staff, (vi) all comments received and responses; (vii) and all exhibits presented to the Board.

This "Supplement" document enumerates the significant changes made to the SUSMP that were directed by the Board at the hearing and the bases for the changes in the "Transcript of Proceedings", testimony presented or materials submitted to the Regional Board, and other relevant documents.

Applicability of the SUSMP

The SUSMP requirements apply to all projects in the nine enumerated categories for the Los Angeles County MS4 Program. While some development planning/ construction requirements in the permit are made applicable only to "Discretionary Projects", this limitation does not cover the seven "enumerated project categories" in Board Order No.

R0072350

96-054, and the two additionally designated "enumerated project categories" by the Regional Board Executive Officer and affirmed by the Regional Board.[1]

Applicability to Categories for the City of Long Beach

A statement has been added to clarify that SUSMP requirements adopted by the Regional Board apply to the City of Long Beach MS4 Program for only: (i) 10-99 home subdivisions; (ii) 100 or more subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Plan.[2]

Effective Date for SUSMP Requirements

A statement has been included to provide Permittees 6 months from the date of Regional Board Executive Officer's approval of the SUSMP to amend ordinances and codes to be consistent with the adopted SUSMP requirements, and thence 30 days thereafter for the requirements to take effect.[3]

Definition of Commercial Development

The definition of "Commercial Development" has been reworded to be inclusive of all developments that are not considered "Residential" or "Heavy Industrial" based on the categorization of the federal storm water regulations.[4]

Definition of Environmentally Sensitive Areas

A new "Table 3" has been added to the SUSMP to list areas presently covered under the definition of "environmentally sensitive areas" based on readily ascertainable designations by the State Water Resources Control Board, the California Resources Agency, and the County of Los Angeles.[5]

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[1] Transcript of Proceedings, January 26, 2000 (CSR No. 10992 and 11568) at 228. Discussion by Regional Board Counsel Leon and direction by Board Member Cloke.

[2] Ibid. at 289. Clarification by Dr. Swamikannu and request by Board Member Cloke to include clear text to explain its applicability to the City of Long Beach.

[3] Ibid at 76 and 300. Recommendation by Mr. Dickerson responding to a question by Regional Board Chairman Nahai and affirmation by Board.

[4] Ibid at 66 and 285. Discussion by Board Members on the scope of the definition and response by Dr. Xavier Swamikannu.

[5] Ibid. at 206, 280, and 305. Discussion with Chairman Nahai and Dr. Coe of the ready ascertainibility of the designated sites, and agreement to provide a listing in the SUSMP.

Definition of Parking Lots

The definition of "Parking Lots " has been reworded to eliminate the "stand alone" limitation, so that it now applies to all parking lots with 5,000 square feet or more or with 25 parking spaces or more and exposed to storm water.[6]

Definition of Redevelopment

The definition of "Redevelopment" has been reworded to include a minimum threshold of at least 5,000 square feet of impervious area addition to an existing property in order for the SUSMP requirements to apply. The threshold value is consistent with other threshold values in the SUSMP, such as Parking Lots and Restaurants.[7]

Definition of Restaurant

The definition of "Restaurant" has been reworded to limit applicability to "stand-alone" facilities and exclude co-located stalls or food counters in general purpose establishments such as markets and grocery stores.[8]

Definition of Retail Gasoline Outlet

The definition of "Retail Gasoline Outlet" has been reworded to include all retail gasoline outlets that sell gasoline and lubricating oils without consideration of the proportion of receipts derived from such sales.[9]

Conflict with Local Practices

The paragraph has been reworded to allow local ordinances to differ from the SUSMP so long as they are more stringent.[10]

Responsibility and Conditions for BMP Transfer

The language has been modified to ensure that the responsibility for the maintenance of Structural or Treatment Control BMPs is properly transferred with the sale of a property and is mandatory.[11]

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[6] Ibid. at 301 and 306. Board Members Cloke and Diamond discuss and direct staff to eliminate the "stand-alone" limitation.

[7] Ibid. at 67 and 302. Board Chairman Nahai discusses the absence of a minimum threshold and directs staff to set a minimum value to address his concerns of proportionality aberrations.

[8] Ibid. at 68. Board Chairman interprets applicability and Dr. Swamikannu confirms the interpretation.

[9] Ibid. at 46, 49, 308. Board Members discuss the staff proposed definition based on primary activity and direct staff to extend the definition to include all gas stations that pump gas.

[10] Ibid. at 308. Board Members discuss the language and provide specific language for the purpose of local program consistency and to ensure adherence to the SUSMP requirements.

Roofing Surface Area Exclusion from Mitigation Standard

The roofing surface credit for calculation of storm water runoff volume for mitigation has been eliminated.[12]

Limited Exclusion for Small Restaurants from Mitigation Standard

The sentence has been clarified to state to exempt restaurants less than 5,000 square feet from the requirement to mitigate storm water only. All other requirements for restaurants apply.[13]

Waiver Provision

The paragraph has been modified to recognize proximity to an unconfined water table as one basis for the granting of a waiver.[14]

A sentence has been added to require that all other BMPs be considered and rejected before a waiver from the numerical mitigation standard is granted.[15]

A statement has been added to require that non-enumerated bases for waiver be brought to the Regional Board for consideration. The Regional Board can delegate the approval authority for a class of waivers to the Regional Board Executive Officer.[16]

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[11] Ibid. at 63 and 313 Board Members discuss the significance of ensuring proper transfer of BMP maintenance responsibility and provide firm enabling language.

[12] Ibid. at 48 and 314. Board Members discuss the elimination of the rooftop exemption with the possibility of reconsideration in the future if Permittees affirmatively demonstrate that rooftop runoff is not a source of pollutants.

[13] Ibid. at 322. Board Members discuss the limited exclusion and agree with Dr. Swamikannu's rationale for the exclusion threshold from numerical design standards.

[14] Ibid. at. 60 Board Member Coe suggests the change to address the issue and Dr. Swamikannu accepts the suggestion.

[15] Ibid. 74 and 326 Board Members discuss the Waiver provision and provide language to ensure that all options for mitigation are considered.

[16] Ibid. at 75 and 328. Board Chairman Nahai provides direction to staff to require any new waiver bases to be brought to the Regional Board to ensure public discussion and consideration.

STANDARD URBAN STORM WATER MITIGATION PLAN

DEVELOPMENT PLANNING

CHANGE SHEET (Revised)

Summary

The Change Sheet lists proposed changes to the Final Tentative - Standard Urban Storm Water Mitigation Plan, (December 7, 1999). In general, the proposed changes respond to commenters' suggestions on improving clarity, format, and implementability of the Standard Urban Storm Water Mitigation Plan.

Noteworthy changes include, the addition of a definition for 'storm event' and the requirement of professional registration for certifying persons under the "Alternative Certification' option. Two new references have been added to augment implementation guidance. These are, (i) National Stormwater Best Management Practices (BMP) Database, Version 1.0, and (ii) Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices.*

In the Change Sheet, cross-reference to pages and paragraphs are for the 'Clean Version' dated December 7, 2000. New text added to a sentence is indicated by underline.

Background

1. Page 2 paragraph three, Clarify that a City has to adopt same requirements for the Citywide SUSMP

   Sentence changed to read, "The Permittees are required to adopt the requirements set herein in their own SUSMP."

2. Page 2 paragraph 3, Delete reference to Urban Storm Water Mitigation to avoid confusion

   Sentence changed to read, "Each Permittee will approve the project plan as part of the development plan approval process....

3. Page 3 paragraph 2, Clarify the environmentally sensitive area category.

   Sentence changed to read, "Location within or directly adjacent to or discharging directly to an environmentally sensitive area.

4. Page 3 paragraph 2, Make requirement applicable to stand-alone parking lots only

   Sentence changed to read, "Commercial stand-alone parking lots 5,000 square feet or more.....

Definitions

5. Order definitions alphabetically

   Definitions reordered alpha-numerically

6. Page 3, Modify definition of hillsides to add specificity.

   Definition changed to read, "property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater."

7. Page 3, Delete exceptions in the definition of Automotive Repair Shop

   Exceptions deleted, now reads, "Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539."

8. Page 3, Modify definition of 100,000 square foot commercial development for simplicity.

   Definition changed to read, "any commercial development that creates at least 100,000 square feet of impermeable area, including parking areas".

9. Page 4 , Add references for definition of environmentally sensitive areas

   References added for Areas of Special Biological Significance and Area of Ecological Significance.

10. Page 4, , Change definition to include a threshold trigger for requirements to apply to Redevelopment

    Definition changed to read, "Redevelopment" means, on an already developed site, the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes.....

11. Page 5, , Change definition for Retail gasoline outlets to clarify 'primarily engaged'.

    Definition changed to read, ""Retail Gasoline Outlet" means a facility engaged in selling gasoline and lubricating oils, which derives more than fifty percent of its annual gross receipts from the sale of gasoline, lubricating oils tires, batteries, automobile parts and other automotive services.

12. New Definition, Define a storm event

    Defined storm event to mean, "a rainfall event that produces more than 0.1 inch of precipitation and that, which is separated from the previous storm event by at least 72 hours of dry weather."

SUSMP Provisions Applicable to All Categories

13. Page 5, paragraph 3, Change sentence for clarity

    Sentence changed to read, "....shall not exceed the estimated pre-development rate for developments where it is reasonably foreseeable that the increased peak storm water discharge rate will result in increased potential for downstream erosion."

14. Page 5, paragraph 4, Delete text that makes act dependent on effort

Sentence changed to read, "Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition."

15. Page 6, paragraph 1, Change sentence for clarity

    Sentence changed to read, "...or the detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and/or flora and fauna."

16. Page 6, paragraph 2, Add reference

    Added reference, "Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices*"

17. Page 6, paragraph 3, Add text to enable BMP combination alternative

    Added text to read, "However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants".

18. Page 6, paragraph 4, Delete text that is tentative

    Text deleted to read, "Project plans must include BMPs consistent....."

19. Page 6, paragraph 4, Add text to promote use of natural drainage systems

    Add text to read, "Utilize natural drainage systems to the maximum extent practicable"

19. Page 6, paragraph 4, Add text to minimize flow to natural drainage systems

    Text added to read, "Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable"

20. Page 7, paragraph 2, Change sentence for clarity

    Sentence changed to read, "Materials with the potential to contaminate storm water must be: (1) placed in an enclosure..."

21. Page 7, paragraph 3, Add text to exclude single family residences

    Sentence added to read, " Individual single family residences are exempt from these requirements"

22. Page 8, paragraph 1, Change text for clarity

    Text changed to read, "The transfer of property to a private or public owner must have conditions..."

23. Page 8, paragraph 1, Add text to require maintenance inspection and record.

    Sentence added to read, "The condition of transfer may include a provision that the property owner conduct maintenance inspection of all treatment control BMPs at least once a year and retain proof of inspection."

24. Page 8, paragraph 3, Delete text for clarity

    Text deleted, "~~each runoff event up to and including~~", Now reads, "the 85th percentile 24-hour runoff event...."

25. Page 8, paragraph 3, Correct based on revised chart treatment volume from 85 percent to 80 percent.

    Text changed to read, "to achieve 80 percent or more volume treatment....."

26. Page 8, paragraph 3, Change text for clarity

    Sentence changed to read, "....runoff produced from a 0.75 inch storm event, prior..."

27. Page 8, paragraph 3, Change text for clarity

    Sentence changed to read, "....volume of runoff produced from a historical-record based reference 24-hour rainfall criterion...."

28. Page 9, paragraph 2, Change text to offer partial credit for roofing surfaces diversion

    Sentence changed to read, "A proportional area of roofing surface may be excluded..."

29. Page 9, paragraph 2, Change text for clarity.

    Sentence changed to read, "storm water conveyance system does not directly discharge to a natural stream or channel segment scheduled for restoration".

30. Page 9, paragraph 3, Change text to clarify exemption from numerical standard only.

    Sentence changed to read, "Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical BMP design standard requirement.

Provisions Applicable to Individual Priority Projects

31. Page 10, paragraph 2, and Page 12, paragraph 1, Change text to eliminate mandatory cover.

    Sentence change to read, "...area must be self-contained and/or covered, equipped with a clarifier,..."

32. Page 12, paragraph 3, Change text for clarity.

    Text modified to read, "....hydrocarbons that are deposited on parking lot surfaces by motor vehicles"

33. Page 12, paragraph 3, Add introductory text.

    Sentence added to read, "To minimize the offsite transport of pollutants, the following design criteria are required".

Waiver

34. Page 13, paragraph 1, Add text for clarity

    Text added to read, "....because an existing or potential underground source of drinking water..."

35. Page 13, paragraph 1, Change text to clarify that Permittee is petitioner.

    Sentence modified to read, "Any other justification for impracticability must be separately petitioned by the Permittee and approved...."

Alternative Certification

36. Page 13, paragraph 1, Change sentences to require professional registration and recommend training verification.

    Sentences added to read "...accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria." And, "The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date."

Suggested Resources

37. Page 15, Add reference BMP database and on-line Texas Non-point Source Book

    Reference added, "National Stormwater Best Management Practices (BMP) Database, Version 1.0" ; and "Texas Non-Point Source Book".

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

Final
Approved – Regional Board Executive Officer
March 8, 2000.

R0072358

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Los Angeles County Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit (City of Long Beach MS4 Permit), which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

1. Effectively prohibit non-storm water discharges, and
2. Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable (MEP statutory standard).

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. The Permittees are required to adopt the requirements set herein in their own SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve the project plan as part of the development plan approval process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

All projects that fall into one of seven categories are identified in the Los Angeles County MS4 Permit as requiring SUSMPs. These categories are:

- Single-Family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements for the Los Angeles County MS4 Permit. These categories are:

- Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and
- Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

The City of Long Beach permit requires SUSMP for the following categories only: (i) 10-99 home subdivisions; (ii) 100 or more subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) Projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Plan.

Permittees shall amend codes and promulgate ordinances not later than September 8, 2000, to give legal effect to the SUSMP requirements. The SUSMP requirements for projects identified herein shall take effect not later than October 8, 2000.

DEFINITIONS

"100,000 Square Foot Commercial Development" means any commercial development that creates at least 100,000 square feet of impermeable area, including parking areas."Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Commercial Development" means any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

"Directly Connected Impervious Area (DCIA)" means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g. lawns).

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

"Environmentally Sensitive Area" means an area designated as an Area of Special Biological Significance by the State Water Resources Control Board (*Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (1994) and amendments) or an area designated as an Area of Ecological Significance by the County of Los *Angeles (Los Angeles County Significant Areas Study, Los Angeles County Department of Regional Planning (1976)* and amendments) or an area designated as a significant natural area by the California Resources Agency. Refer to Table 3 for a listing.

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater.

"Infiltration" means the downward entry of water into the surface of the soil.

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

"Parking Lot" means land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with a lot size of 5,000 square feet or more, or with 25 or more parking spaces.

"Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces.

"Restaurant" means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812).

"Retail Gasoline Outlet" means any facility engaged in selling gasoline and lubricating oils.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Storm Event" means a rainfall event that produces more than 0.1 inch of precipitation and that, which is separated from the previous storm event by at least 72 hours of dry weather.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes, (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMP to be consistent with the code, except that to the extent that the standards in the SUSMP are more stringent than those under local codes, such more stringent standards shall apply.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system. The development must be designed so as to minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those

BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices* and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* , USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants.

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

Project plans must include BMPs consistent with local codes and ordinances and the SUSMP to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Utilize natural drainage systems to the maximum extent practicable
- Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the storm water conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are

effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system, the following Structural or Treatment BMPs are required:

- Materials with the potential to contaminate storm water must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- The storage area must have a roof or awning to minimize collection of storm water within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following Structural or Treatment Control BMP requirements (individual single family residences are exempt from these requirements):

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included or is required to include, Structural or Treatment Control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, the verification will include the developer's signed statement, as part of the project application, accepting responsibility for all structural and treatment control BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance. The transfer of property to a private or public owner must have conditions requiring the recipient to assume responsibility for maintenance of any Structural or Treatment Control BMP to be included in the sales or lease agreement for that property, and will be the owner's responsibility. The condition of transfer shall include a provision that the property owners conduct maintenance inspection of all Structural or Treatment Control BMPs at least once a year and retain proof of inspection. For residential properties where the Structural or Treatment Control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&Rs). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what storm water management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. The transfer of this information shall also be required with any subsequent sale of the property.

If Structural or Treatment Control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Structural or Treatment Control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR STRUCTURAL OR TREATMENT CONTROL BMPs

Structural or Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

Post-construction Structural or Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial,* (1993), or

3. the volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

Limited Exclusion

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical Structural or Treatment Control BMP design standard requirement only.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

REQUIREMENTS

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. The area in the site design must be:

- Self-contained and/ or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

The activity of outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must be:

- Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- The fuel dispensing area should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The

cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- The fuel dispensing areas must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all wash-water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. This area must be:

- Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor-vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL CONTAMINATION AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. A waiver of impracticability shall be granted only when all other Structural or Treatment Control BMPs have been considered and rejected as infeasible. Recognized situations of impracticability include, (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately petitioned by the Permittee and submitted to the Regional Board for consideration. The Regional Board may consider approval of the waiver justification or may delegate the authority to approve a class of waiver justifications to the Regional Board Executive Officer. The supplementary waiver justification becomes recognized and effective only after approval by the Regional Board or the Regional Board Executive Officer. A waiver granted by a Permittee to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPs

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

In lieu of conducting detailed BMP review to verify Structural or Treatment Control BMPs adequacy, a Permittee may elect to accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria established herein. The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date. Training conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, or the California Water Environment Association) may be considered qualifying.

14. RESOURCES AND REFERENCE

TABLE 1

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different storm water-filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Texas Nonpoint Source Book – Online Module (1998)www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Storm Water Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150
Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
National Stormwater Best Management Practices (BMP) Database, Version 1.0 Provides data on performance and evaluation of storm water BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000

SUGGESTED RESOURCES	HOW TO GET A COPY
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2

EXAMPLE BEST MANAGEMENT PRACTICES (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended/dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil/Water separators
- Catch basin inserts
- Continuous flow deflection/ separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

TABLE 3

HABITAT PROTECTION IN THE LOS ANGELES COUNTY AREA

Agency:
State Water Resources Control Board

Designation:
Areas of Significant Biological Significance (ASBS)

Definition:
Areas designated by the State Water Resources Control Board as requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable.

Affected Area:
(See Table 1 & Figure 2)

Agency:
Los Angeles County Department of Regional Planning

Designation:
Significant Ecological Areas (SEA)

Definitions:
Significant Ecological Areas (SEAs) are areas that have been identified by the Los Angeles County General Plan as containing unique or unusual species assemblages, or areas of habitat that are rapidly declining in the Los Angeles County. The SEAs were established to protect a special or sometimes unique collection of habitats and species from loss due to encroachment and human disturbances. However, SEAs are not intended to function as isolated preservation areas.

Affected Areas:
(See Table A & Figure 1)

Agency:
California Department of Fish & Game

Designation:
Natural Communities Conservation Plan Region (NCCP)

Definition:
Identifies and provides for the regional or area wide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth. The goal of the program is to protect sufficient resources in regional preserves to assure the survival of the ecosystem and, at the same time, permit compatible uses of less sensitive land.

Affected Area:
(See Table 1 & Figure 3)

TABLE 3 A

HABITAT PROTECTION IN LOS ANGELES COUNTY AREA1

Figure 1	AFFECTED AREA	DESIGNATION	DESIGNATING AGENCY
1.	Malibu Coastline	SEA	LACDRP
2.	Point Dume	SEA	LACDRP
3.	Zuma Canyon	SEA	LACDRP
4.	Upper La Sierra Canyon	SEA	LACDRP
5.	Malibu Canyon and Lagoon	SEA	LACDRP
5.	Malibu Creek State Park Buffer Area	SEA	LACDRP
6.	Las Virgenes	SEA	LACDRP
7.	Hepatic Gulch	SEA	LACDRP
9.	Cold Creek	SEA	LACDRP
10.	Tuna Canyon	SEA	LACDRP
11.	Temescal-Rustic-Sullivan Canyons	SEA	LACDRP
12.	Palo Comado Canyon	SEA	LACDRP
13.	Chatsworth Reservior	SEA	LACDRP
14.	Simi Hills	SEA	LACDRP
15.	Tonner Canyon/Chino Hills	SEA	LACDRP
16.	Buzzard Peak/ San Jose Hills	SEA	LACDRP
17.	Powder Canyon/Punte Hills	SEA	LACDRP
18.	Way Hills	SEA	LACDRP
19.	San Francisquito Canyon	SEA	LACDRP
20.	Santa Susana Mountains	SEA	LACDRP
21.	Santa Susana Pass	SEA	LACDRP
22.	Santa Fe Dam Floodplain	SEA	LACDRP
23.	Santa Clara River	SEA	LACDRP
24.	Tujunga Valley/Hansen Dam	SEA	LACDRP
25.	San Dimas Canyon	SEA	LACDRP
26.	San Antonio Canyon Mouth	SEA	LACDRP
27.	Portuguese Bend Landslide	SEA	LACDRP
28.	El Segundo Dunes	SEA	LACDRP
29.	Ballona Creek	SEA	LACDRP
30.	Alamitos Bay	SEA	LACDRP
31.	Rolling Hills Canyons	SEA	LACDRP
32.	Agua Amarga Canyon	SEA	LACDRP
33.	Terminal Island	SEA	LACDRP
34.	Palos Verdes Peninsula Coastline	SEA	LACDRP
35.	Harbor Lake Regional Park	SEA	LACDRP
36.	Madrona Marsh	SEA	LACDRP
37.	Griffith Park	SEA	LACDRP
39.	Encino Reservoir	SEA	LACDRP
40.	Verdugo Mountains	SEA	LACDRP

1 This list is a compilation of data from the Department of Fish & Game, State Water Resources Control Board, and the Los Angeles County Department of Regional Planning as of February 29, 2000. Areas in this may changes, as area are added or deleted by the designating agencies.

	AFFECTED AREA	DESIGNATION	DESIGNATING AGENCY
42.	Whittier Narrows Dam County Recreation Area	SEA	LACDRP
43.	Rio Hondo College Wildlife Santuary	SEA	LACDRP
44.	Sycamore and Turnbull Canyons	SEA	LACDRP
45.	Dudleya Densiflora Population	SEA	LACDRP
62.	Galium Grande Population	SEA	LACDRP
63.	Lyon Canyon	SEA	LACDRP
64.	Valley Oaks Savannah, Newhall	SEA	LACDRP
Fig.2	Point Dume to Latigo Point	ASBS	SWRCB
Fig.3	Palos Verdes Peninsula	NCCP	DFG

FIGURE 1

SIGNIFICANT ECOLOGICAL AREAS IN LOS ANGELES COUNTY

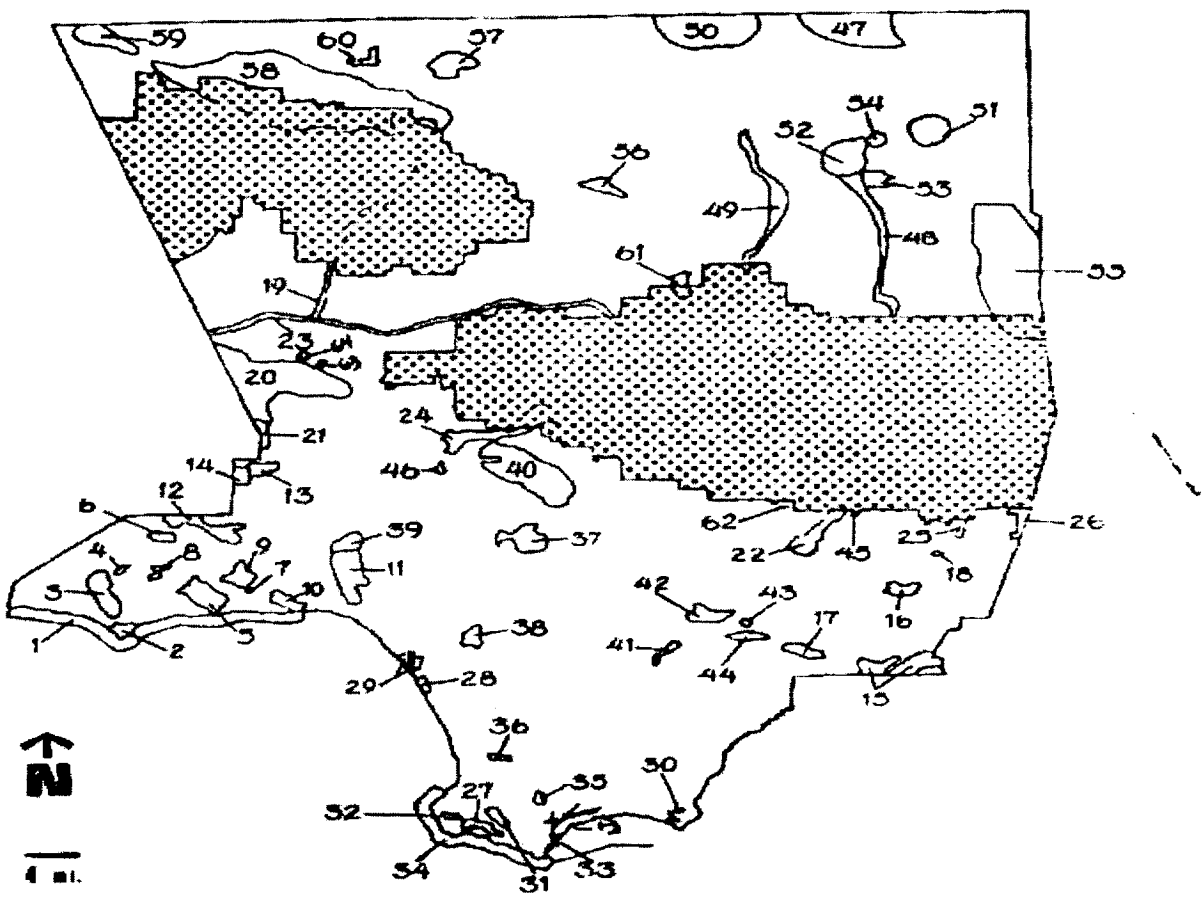


FIGURE 2

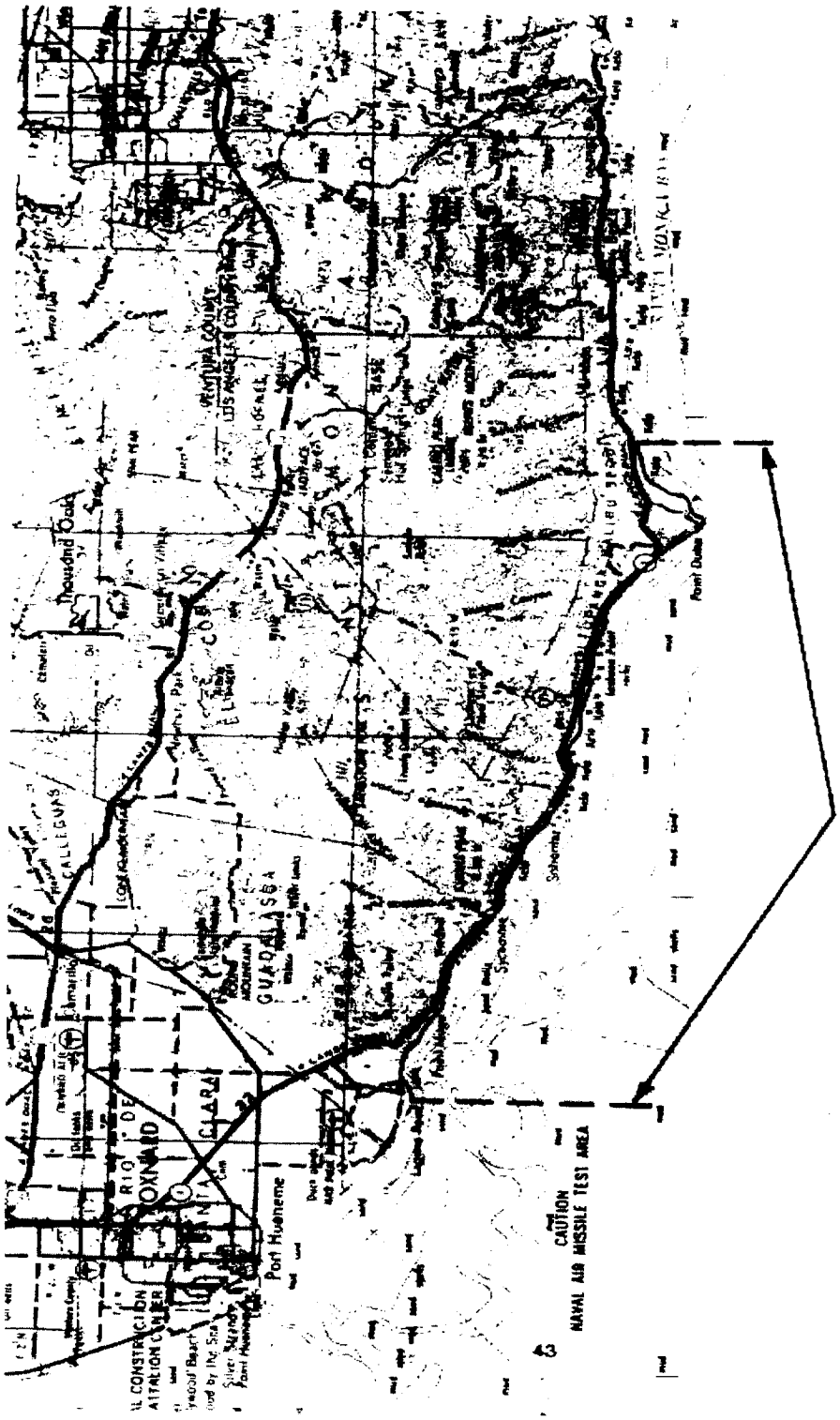
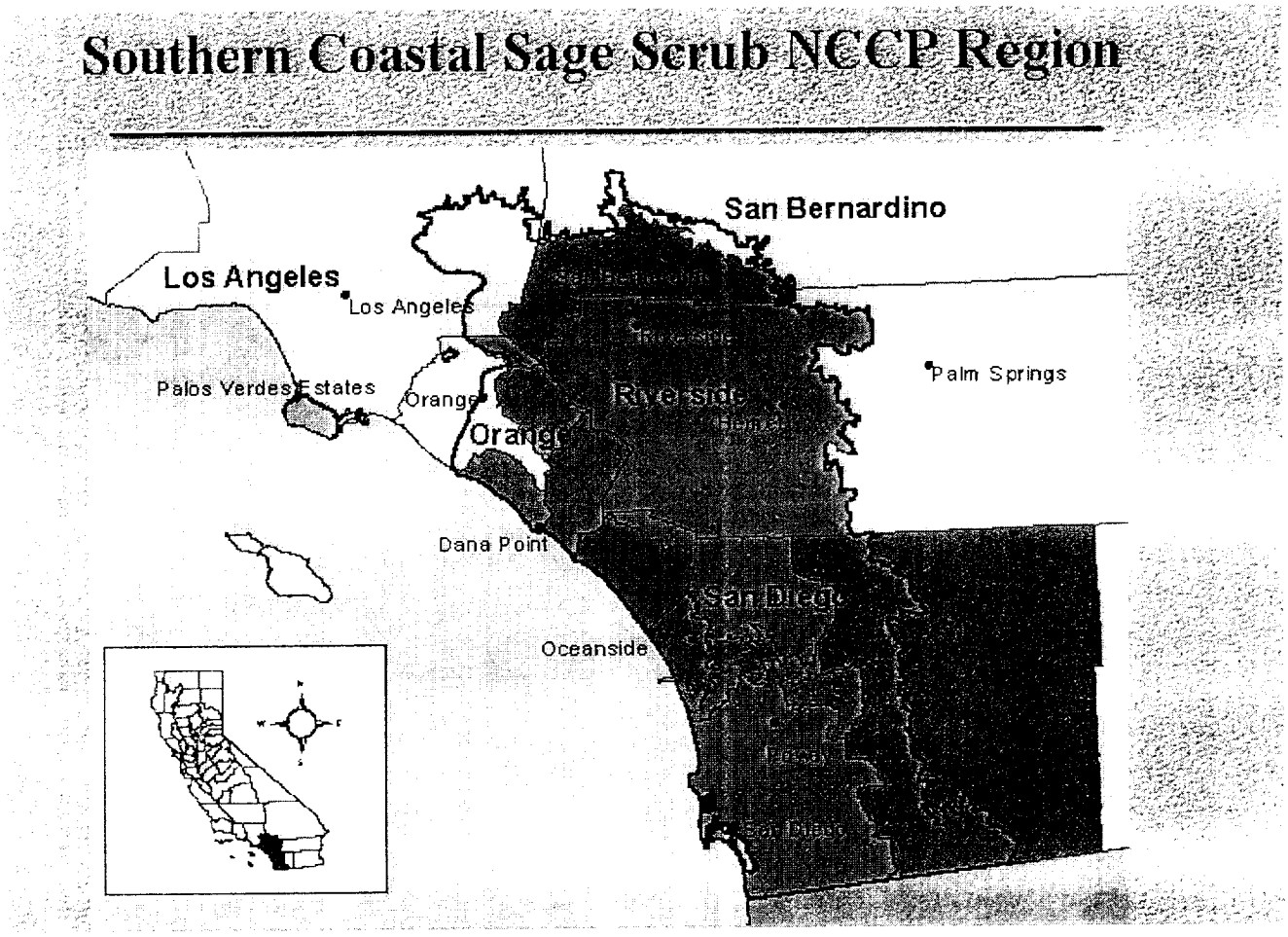


FIGURE 24
POINT MUGU TO LATIGO POINT
AREA OF SPECIAL BIOLOGICAL SIGNIFICANCE
Ref. Maps: USGS Point Mugu, CA
Point Dume, CA
Scale: 1 inch = 4 miles
Seaward boundary is 100-foot isobath or 1000 feet offshore, whichever is more distant.

(For enlarged delineation of boundary lines, SEE FIGURES 24a and 24b)

FIGURE 3


Southern Coastal Sage Scrub NCCP Region
San Bernardino
Los Angeles
Los Angeles
Palos Verdes Estates
Orange
Orange
Riverside
Palm Springs
Dana Point
San Diego
Oceanside

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State Water Resources Control Board

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Gray Davis
Governor

March 30, 2000

CERTIFIED MAIL

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Dear Mr. Montevideo, Mr. Deitsch, and Mr. Welch:

PETITIONS OF THE CITIES OF ARTESIA, ET AL., THE CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD, AND ACTIONS AND FAILURES TO ACT BY BOTH THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]), LOS ANGELES REGION: CONSOLIDATION OF COMPLETED PETITIONS, 20-DAY RESPONSE
SWRCB/OCC FILES A-1280, A-1280(a) AND A-1280(b)

The above-referenced petitions are complete. As authorized by the California Code of Regulations, title 23, section 2054, the petitions will be consolidated for review since they are legally and factually related. The Los Angeles Regional Water Quality Control Board (RWQCB) and other interested parties may now file a response to the petitions. Responses are due within 20 days of the date of this letter, addressed to my attention. In addition, all responses must be sent to the Cities of Artesia, et al., the City of Arcadia and Western States Petroleum Association, at the addresses listed above and, if appropriate, to the RWQCB. The RWQCB is requested to file the administrative record (copied on one side to the extent possible) within this 20-day period.

Copies of the petitions may be obtained from the Cities of Artesia, et al., the City of Arcadia and Western States Petroleum Association. If you have any questions regarding this letter, please contact me at (916) 657-2421 or CALNET 8-437-2421.

Sincerely,

Elizabeth Miller Jennings
Senior Staff Counsel

cc: See next page

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Interested Persons Mailing List

Petitions of the Cities of Artesia, et al., the City of Arcadia, and Western States Petroleum Association

SWRCB/OCC Files A-1280, A-1280a &A-1280b ####(a)

SWRCB
Office of Chief Counsel
INTERESTED PERSONS MAILING LIST
3-24-00

Los Angeles Regional Water Quality Control Board Order No. 96-054, Permit for Municipal Storm Water and Urban Run-off Discharges [NPDES NO. CAS614001]

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Dear Mr. Montevideo and Mr. Welch:

PETITIONS OF THE CITIES OF BELLFLOWER, ET AL. AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD, AND ACTIONS AND FAILURES TO ACT BY BOTH THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]), LOS ANGELES REGION: AMENDMENT OF PARTIES TO PETITION
SWRCB/OCC FILES A-1280 and A-1280(b)

I have received your amendments to the above petitions. The City of Artesia will be deleted as a petitioner, and the Cities of Bell Gardens, Compton, Hawaiian Gardens, Huntington Park, Industry, Montebello, Paramount, Rosemead and San Gabriel will be added as petitioners. The title of petition A-1280 will now refer to the Cities of Bellflower et al.

The amended petitions you filed will be reviewed along with the original petition. The Los Angeles Regional Water Quality Control Board (RWQCB) and interested persons may submit responses to the amended petitions within 20 days of the date of this letter. In addition, all responses must be sent to the Cities of Bellflower et al. and Western States Petroleum Association, at the addresses listed above and, if appropriate, to the RWQCB.

Copies of the amended petitions may be obtained from the Cities of Bellflower et al. and Western States Petroleum Association. If you have any questions regarding this letter, please contact me at (916) 657-2421 or CALNET 8-437-2421.

Sincerely,

Elizabeth M. Jennings
Senior Staff Counsel

R0072392

cc: Mr. Dennis Dickerson
Executive Officer
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Interested Persons Mailing List

Petitions of the Cities of Artesia, et al., the City of Arcadia, and Western States Petroleum Association

SWRCB/OCC Files A-1280, A-1280a &A-1280b

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Los Angeles Regional Water Quality Control Board. Order No. 96-054, Permit for Municipal Storm Water and Urban Run-off Discharges [NPDES NO. CAS614001]

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Dear Messrs. Swamikannu and Beckman:

PETITIONS OF THE CITIES OF BELLFLOWER, ET AL., CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD, AND ACTIONS AND FAILURES TO ACT BY BOTH THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]), LOS ANGELES REGION: EXTENSION OF TIME TO RESPOND
SWRCB/OCC FILES A-1280, A-1280(a), and A-1280(b)

Pursuant to your requests, the administrative record of the Los Angeles Regional Water Quality Control Board (RWQCB) and all responses to these petitions and amendments thereto are now due on May 2, 2000. The RWQCB and interested persons may submit responses to the petition and amendments by that date.

If you have any questions regarding this letter, please contact me at (916) 657-2421 or CALNET 8-437-2421.

Sincerely,

Elizabeth M. Jennings
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cc: Mr. Dennis Dickerson
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Petitions of the Cities of Artesia, et al., the City of Arcadia, and Western States Petroleum Association

RCB/OCC Files A-1280, A-1280a &A-1280b

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REVISED: 04-17-00

Los Angeles Regional Water Quality Control Board Order No. 96-054, Permit for Municipal Storm Water and Urban Run-off Discharges [NPDES NO. CAS614001]

Petitions of
the Cities of Artesia, et al., the City of
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Dear Messrs. Montevideo, Welch, and Deitsch:

PETITIONS OF THE CITIES OF BELLFLOWER, ET AL., THE CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD, AND ACTIONS AND FAILURES TO ACT BY BOTH THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]), LOS ANGELES REGION: DISMISSAL OF STAY REQUEST **SWRCB/OCC FILES A-1280, A-1280(a), and A-1280(b)**

Review of the above-referenced requests for stay is complete. This review indicates that the request for stay in this matter fails to produce proof of all three of the prerequisites for a stay as specified in California Code of Regulations, title 23, section 2053. Accordingly, your request is denied. The petition you filed with the State Water Resources Control Board (State Water Board) concerning the above-mentioned matter is still under review. As described in a separate Notice, the State Water Board will hold a hearing on the merits of the petitions. You will also be notified of any further action on your petitions.

If you have any questions about this matter, please contact Elizabeth Miller Jennings, Senior Staff Counsel, in the Office of Chief Counsel, at (916) 657-2421.

Sincerely,

Edward C. Anton
Acting Executive Director

cc: See next page

cc: Mr. Dennis Dickerson
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Interested Persons Mailing List

Petitions of the Cities of Artesia, et al., the City of Arcadia, and Western States Petroleum Association.

SWRCB/OCC Files A-1280, A-1280a &A-1280b

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REVISED: 04-17-00

Los Angeles
Regional Water Quality Control Board
Order No. 96-054, Permit for Municipal Storm Water and Urban Run-off Discharges
[NPDES NO. CAS614001]

Petitions of
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SWRCB/OCC Files A-1280, A-1280a &A-1280b

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NOTICE OF PUBLIC HEARING

Petitions of the Cities of Bellflower, et al., the City of Arcadia, and Western States Petroleum Association (Review of January 26, 2000 Action of the Regional Board, and Actions and Failures to Act by Both the Regional Board and its Executive Officer Pursuant to Order No. 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges within Los Angeles County [NPDES NO. CAS614001]). SWRCB/OCC FILES A-1280, A-1280(a) and A-1280(b)

Wednesday, June 7, 2000 -- 10:00 a.m.
and, if necessary,
Thursday, June 8, 2000 -- 9:00 a.m.
at
Community Meeting Hall
Torrance Cultural Arts Center
3350 Civic Center Drive
Torrance, CA 90503

00 MAY 12 AM 9:35
QUALITY CONTROL BOARD
LOS ANGELES REGION

PURPOSE OF HEARING

The State Water Resources Control Board (State Water Board) has scheduled a hearing on the above petitions at the time and place noted above. The hearing will take place on June 7, 2000 at 10:00 a.m. If necessary, the State Water Board will continue the hearing on June 8, 2000, at 9:00 a.m. The purpose of the hearing is to receive oral and written testimony and policy statements that will assist the State Water Board in reviewing the actions of the Los Angeles Regional Water Quality Control Board (Regional Water Board) and its Executive Officer in approving and issuing the Standard Urban Storm Water Mitigation Plan (SUSMP).

The State Water Board may meet in closed session to deliberate on a decision to be made based on evidence taken at the hearing, either immediately following the hearing or at a subsequent time. The closed session is authorized under Government Code section 11126, subdivision (c)(3). The State Water Board may consider taking further action on these petitions. If so, a draft decision will be circulated to the public, prior to adoption at a subsequent public meeting. As described in a separate letter, the State Water Board will not hold a hearing on the stay request in this matter.

HEARING PROCEDURES

A copy of the procedures governing State Water Board hearings may be found at

Title 23, California Code of Regulations, section 648 and following, and is available at http://www.swrcb.ca.gov/cawtrcde/adcov.doc or upon request. The hearing will not be conducted as a formal hearing under Chapter 5 of the Administrative Procedure Act (commencing at Government Code section 11500).

HEARING PARTICIPATION

Participants at the hearing are either "parties" or "interested persons." Parties to the hearing may present evidence and are subject to cross-examination. Parties may also cross-examine witnesses for other parties. Interested persons may present non-evidentiary policy statements, and are not subject to cross-examination. Interested persons may not cross-examine parties.

The following participants are hereby designated as parties at the hearing:

1. All cities named as petitioners in Files A-1280 and A-1280(a), Building Industry Association of Southern California, Building Industry Legal Defense Foundation
2. Western States Petroleum Association
3. Natural Resources Defense Council, Santa Monica BayKeeper, Heal the Bay
4. Los Angeles Regional Water Quality Control Board

All other persons who wish to participate in the hearing as a party must request party status by submitting a request no later than **May 19, 2000**. The request must explain the basis for status as a party, the evidence that will be presented, and a statement explaining why the above parties do not adequately represent the person's interests.

To ensure that all participants have an opportunity to participate in the hearing, the following time limits will apply. Each of the four parties listed above, and any other parties that are designated, will have 60 minutes to testify. Each interested person will have 3 minutes to present a policy statement. Participants with similar comments are requested to make joint presentations, and participants are requested to avoid redundant comments. Additional time may be provided upon a showing that additional time is necessary.

WRITTEN TESTIMONY, EXHIBITS AND POLICY STATEMENTS

The administrative record before the Regional Water Board in this matter will be made a part of the record before the State Water Board. Therefore, documents and evidence already in the record should not be submitted. A brief summary of earlier submissions is acceptable, if it is received by the deadlines below.

All written evidence and exhibits must be received no later than **May 31, 2000**. Non-evidentiary policy statements must be received by the close of the hearing.

Each party proposing to present testimony and exhibits on factual or other evidentiary matters at the hearing must submit the testimony and exhibits in writing. Oral testimony that goes beyond the scope of written testimony may be excluded. Persons who propose to offer expert testimony must include a statement of qualifications of the expert witness. Parties must submit 8 copies of written testimony and

must submit 8 copies of written testimony and exhibits to the State Water Board, and must send one copy to each of the other parties at the addresses listed below. Interested persons may submit one copy of policy statements in advance to the State Water Board only.

Cities of Bellflower, et al.
Richard Montevideo, Esq.
Rutan & Tucker
611 Anton Boulevard, 14th Floor
Costa Mesa, CA 92626-1950

City of Arcadia
Stephen P. Deitsch, Esq.
Best, Best & Krieger
3750 University Avenue, Suite 400
P.O. Box 1028
Riverside, CA 92502-1028

Western States Petroleum Association
Lyman C. Welch, Esq.
Mayer, Brown & Platt
190 S. La Salle Street
Chicago, IL 60603-3441

Los Angeles Regional Water Quality Control Board
Dennis Dickerson, Executive Officer
Los Angeles Regional Water Quality Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

National Resources Defense Council, Santa Monica BayKeeper, Heal the Bay
David Beckman, Esq.
National Resources Defense Council
6310 San Vicente Blvd., Suite 250
Los Angeles, CA 90048

Materials submitted to the State Water Board should be addressed as follows:

Elizabeth Miller Jennings, Esq.
Office of Chief Counsel
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

IF YOU HAVE ANY QUESTIONS

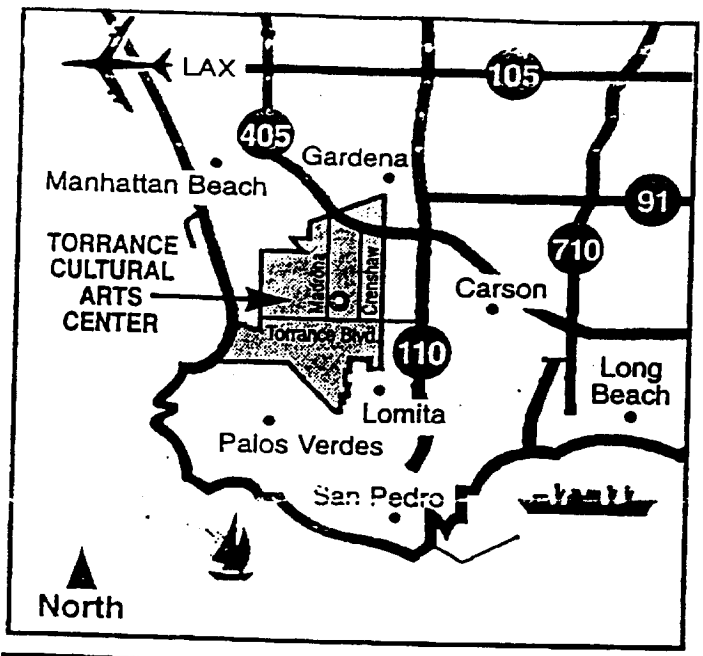
Questions concerning the hearing may be addressed to Elizabeth Miller Jennings, Senior Staff Counsel, at (916) 657-2421.

LOCATION AND ACCESSIBILITY

The enclosed map shows the location of the Torrance Cultural Arts Center. The Community Meeting Hall is accessible to persons with disabilities.

Maureen Marché
Administrative Assistant to the Board

Dated: May 11, 2000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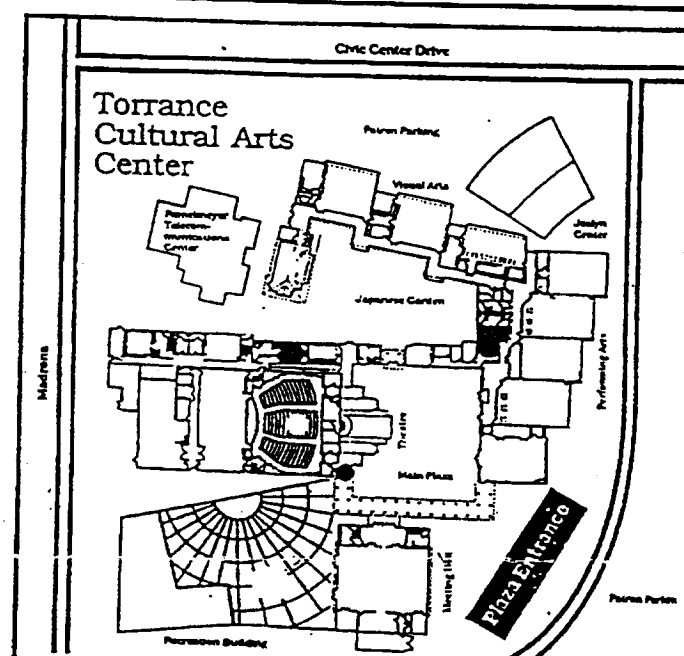
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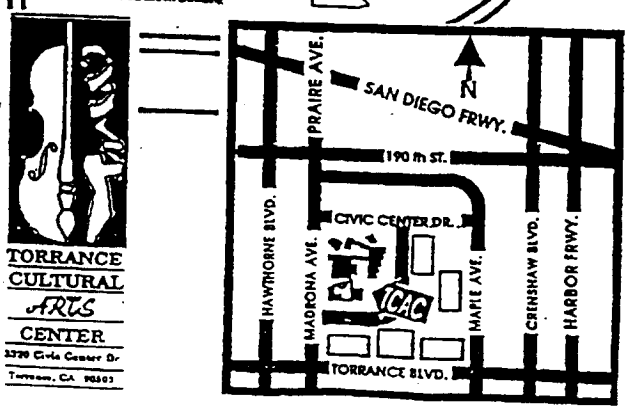
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HARBOR FRWY.
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Winston H. Hickox
Secretary for
Environmental
Protection

State Water Resources Control Board

Office of Chief Counsel
901 P Street • Sacramento, California 95814 • (916) 657-2154
Mailing Address: P.O. Box 100 • Sacramento, California 95812-0100
FAX (916) 653-0428 • Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

RECEIVED
00 MAY 30 PM 1:44
STATE WATER RESOURCES CONTROL BOARD
QUALITY CONTROL BOARD
LOS ANGELES REGION

MAY 25 2000

Richard Montevideo, Esq.
Rutan & Tucker
611 Anton Boulevard, 14th Floor
Costa Mesa, CA 92626-1950

Dear Mr. Montevideo:

PETITIONS OF THE CITIES OF BELLFLOWER, ET AL., CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD, AND ACTIONS AND FAILURES TO ACT BY BOTH THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]), LOS ANGELES REGION: RESPONSE TO LETTER DATED MAY 23, 2000
SWRCB/OCC FILES A-1280, A-1280(a), and A-1280(b)

In response to your letter dated May 23, 2000, the State Water Resources Control Board (State Water Board) considers the issues in your petition to be very important, and therefore, in response to your request, is hearing the matter at its earliest opportunity. In light of the petitioners' interest in resolving these issues quickly, and the requirement that a petitioner who requests a hearing must describe in detail the evidence that it will provide in making that request (California Code of Regulations (CCR), title 23, section 2050(b)), the timing of the notice for the hearing and the hearing itself appears appropriate. I am aware that two comment letters in the 14-volume administrative record were not included, but I have requested staff at the Los Angeles Regional Water Quality Control Board (Regional Water Board) to provide these.

Regarding your questions about the hearing process, I believe the hearing notice is clear, and it is in compliance with the Administrative Procedure Act (APA) (Government Code section 11400 et seq.; APA).

The State Water Board has complied with the procedures set forth in Title 23, CCR section 648.1 for designating parties. If you wish to contest those designations, you may make those arguments during your presentation to the Board at the hearing. The time for cross-examination will not be included in your 60-minutes presentation. The chairman will determine amount of time for cross-examination in the proceedings. The allowance for a closing statement is discretionary. (Id., at section 648.5(d).) If the Board members allow closing statements, they will not be

deducted from the 60 minutes. Regarding your question about subpoenas, the rule regarding their use is in California Code of Regulations, title 23, section 649.6.

You question the authority of the State Water Board to meet in closed session following the conclusion of the hearing. The Open Meeting Act allows for closed session "to deliberate on a decision to be reached in a proceeding required to be conducted pursuant to Chapter 5 (commencing with section 11500) or Part 1 of Division 3 of title 2 [formal hearings under the APA] *or similar provisions of law*." (Government Code section 11126(c)(3); emphasis added.) In this matter, the State Water Board is holding a formal hearing pursuant to Chapter 4.5 (commencing with section 11400) of the APA. This hearing, which includes notice and cross-examination, is similar to the Chapter 5 formal hearing, and a closed session is authorized by section 11126(c)(3). Finally, you state that you reserve the right to object of holding an "informal hearing." This is not an informal hearing, and California Code of Regulations, title 23, section 648.7 is not applicable.

If you have any questions, you may contact me at 916-657-2421.

Sincerely,

Elizabeth M. Jennings
Senior Staff Counsel

cc: Lyman C. Welch, Esq.
Mayer, Brown & Platt
190 S. La Salle Street
Chicago, IL 60603-3441

Stephen P. Deitsch, Esq.
Best, Best & Krieger
3750 University Avenue, Suite 400
P.O. Box 1028
Riverside, CA 92502-1028

Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality
Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Interested Persons Mailing List

Xavier

JAL

State Water Resources Control Board

Winston H. Hickox
Secretary for Environmental Protection

Office of Chief Counsel
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Mailing Address: P.O. Box
FAX (916) 653-0428 • Int

Gray Davis
Governor

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To Dennis Dickerson	From Jorge León
Co. Xiv Swanton	Co.
Dept.	Phone #
Fax # Issues List expanded	Fax #

JUN 12 2000

Richard Montevideo, Esq.
Rutan & Tucker
611 Anton Boulevard, 14th Floor
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Mayer, Brown & Platt
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Office of Chief Counsel
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Stephen P. Deitsch, Esq.
Best, Best & Krieger
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P.O. Box 1028
Riverside, CA 92502-1028

Mr. Alex N. Helperin
Natural Resource Defense Council
6310 San Vincente Blvd., Suite 250
Los Angeles, CA 90048

Dear Messrs. Montevideo, Deitsch, Welch, Helperin, and León:

PETITIONS OF THE CITIES OF BELLFLOWER, ET AL., CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD, AND ACTIONS AND FAILURES TO ACT BY BOTH THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]), LOS ANGELES REGION: POST HEARING BRIEFS
SWRCB/OCC FILES A-1280, A-1280(a), and A-1280(b)

As Acting Chairman Baggett stated at the conclusion of the June 7-8 hearing in Torrance, you are each asked to submit a post-hearing brief in this matter. The briefs must be received at this office no later than 5:00 p.m. on July 7, 2000. Late submittals will not be entered into the record or considered. The briefs are subject to a 10-page, double-spaced limit. No new evidence, exhibits or testimony may be attached. You may make references to documents that are already in the record.

The State Water Resources Control Board (State Water Board) would like you to address the following questions in your brief. This information may be of great use to the State Water Board in formulating its response to the petitions. It will be most useful if you provide specific language that you believe should be included in the Standard Urban Storm Water Mitigation Plans (SUSMP).

1. If there is to be a numeric design standard for infiltration or treatment, is the .75-inch standard appropriate? Should it be substituted with a different numeric standard, including potentially different numbers for different areas? If there were a range of numbers, how would that be implemented?

2. What types of redevelopment or remodeling projects should be included within the mitigation requirements?

3. Should location, such as environmentally-sensitive areas, be a factor in determining the application of the SUSMP? If so, what specific types of projects should be included?

4. Should the SUSMP apply to both discretionary projects and ministerial projects? How should the term "discretionary" be defined?

If you have any questions about the post-trial briefs, please call Bruce Fujimoto, Chief of the Storm Water Unit, at 916-657-0908.

Sincerely,

Craig M. Wilson

Craig M. Wilson
Acting Chief Counsel

cc: Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality
Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Mr. Bruce Fujimoto
Division of Water Quality
State Water Resources Control Board
P.O. Box 944213
Sacramento, CA 94244-2130

bc: Sheila Vassey, OCC
Betsy Jennings, OCC
Marleigh Wood, OCC
Jorge León, OCC
Darcy Heryford, OCC

BMJennings/llstomsld
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Winston H. Hickox
Secretary for Environmental Protection

State Water Resources Control Board

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FAX (916) 653-0428 • Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

AUG 28 2000

CERTIFIED MAIL

Richard Montevideo, Esq.
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Mayer, Brown & Platt
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Chicago, IL 60603-3441

Stephen P. Deitsch, Esq.
Best, Best & Krieger
3750 University Avenue, Suite 400
P.O. Box 1028
Riverside, CA 92502-1028

Dear Messrs. Montevideo, Welch, and Deitsch:

PETITIONS OF THE CITIES OF BELLFLOWER, ET AL, THE CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD, AND ACTIONS AND FAILURES TO ACT BY BOTH THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]), LOS ANGELES REGION: BOARD MEETING NOTIFICATION
SWRCB/OCC FILES A-1280, A-1280(a), and A-1280(b)

Enclosed is a copy of the proposed order in the above-entitled matter. The State Water Resources Control Board (SWRCB) will consider this order at a special meeting which will be held during its workshop session on *Thursday, October 5, 2000,* commencing at *10:00 a.m.* in the First Floor Hearing Room of the Bonderson Building, 901 P Street, Sacramento.

The SWRCB has already held a hearing in this matter. Evidence relating to this matter will not be heard at the meeting or accepted before the meeting. You may submit written comments on the order so long as they are received at the SWRCB no later than *Thursday, September 28, 2000, at 5:00 pm.*

At the meeting, interested persons will be allowed to comment orally on the draft order, subject to the following time limits. Each designated party will be allowed up to five minutes for oral comment, with an additional reasonable time for questions by the SWRCB members. Other interested persons will be allotted a lesser amount of time to address the SWRCB as time permits. The order may be adopted at the special meeting as proposed or may be modified as determined by the SWRCB.

If there are any questions or comments, please call Elizabeth Miller Jennings, Senior Staff Counsel, of the Office of Chief Counsel, at (916) 657-2421.

Sincerely,

Craig M. Wilson
Chief Counsel

Enclosure

cc: Mr. Dennis Dickerson
Executive Officer
Los Angeles Regional Water Quality
Control Board
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Interested Persons Mailing List

D • R • A • F • T

August 24, 2000

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 2000-

In the Matter of the Petitions of
THE CITIES OF BELLFLOWER, ET AL., THE CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION
Review of January 26, 2000 Action of the Regional Board
and
Actions and Failures to Act
by both the
California Regional Water Quality Control Board,
Los Angeles Region and Its Executive Officer
Pursuant to Order No. 96-054,
Permit for Municipal Storm Water and Urban Run-Off Discharges Within
Los Angeles County
[NPDES NO. CAS614001]

SWRCB/OCC FILES A-1280, A-1280(a) and A-1280(b)

BY THE BOARD:

On July 15, 1996, the Los Angeles Regional Water Quality Control Board (Regional Water Board) issued a revised national pollutant discharge elimination system (NPDES) permit in Order No. 96-054 (permit) to the 85 incorporated cities and the county within Los Angeles County (the County).[1] The permit covers storm water discharges from municipal separate storm sewer systems throughout the County.[2]

[1] This was the second storm water permit adopted for Los Angeles County and its cities. The first permit was the subject of an earlier Order. (In the Matter of Natural Resources Defense Council, Inc., Order WQ 91-04). In this permit, the County is designated as the Principal Permittee, and each city is designated as a permittee. The County is required to submit various documents on behalf of all of the permittees.
[2] The Regional Water Board has since issued a separate permit for one city, Long Beach. The relevant provisions of the Long Beach permit are similar to those in Order No. 96-054.

The permit contains provisions for the regulation of storm water discharges from development planning and construction.[3] Pursuant to these provisions, the County was required to submit Standard Urban Storm Water Mitigation Plans (SUSMPs).[4] The SUSMPs are plans that designate best management practices (BMPs) that must be used in specified categories of development projects. The County submitted SUSMPs, but the Regional Water Board approved the SUSMPs only after making revisions. The Executive Officer issued the revised SUSMPs on March 8, 2000.[5]

On February 25, 2000, the State Water Resources Control Board (State Water Board or Board) received a petition for review of the actions and failures to act regarding the SUSMPs from a number of cities, the Building Industry Association of Southern California and the Building Industry Legal Defense Foundation (jointly referred to as Cities). A second petition was received from the City of Arcadia. And a third petition was received from the Western States Petroleum Association (WSPA). On April 7, 2000, the petitioners filed amendments to their petitions, concerning the March 8, 2000 issuance of the SUSMPs. The Cities' amendment also revised the list of cities included in the petition. The Cities' petition now includes 32 cities. The petitions are legally and factually related, and have therefore been consolidated for purposes of review.[6] The petitioners also requested a stay of the SUSMPs. This request was denied by letter, dated May 11, 2000.

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[3] Permit, Part 2.III. These provisions focus more on post-construction impacts of development than on discharges from construction activities.
[4] Permit, Part 2.III.A.1.c.
[5] These are referred to herein as the Final SUSMPs. The Final SUSMPs also apply to Long Beach, even though it is subject to a separate permit.
[6] Cal. Code of Regs., tit. 23, section 2054.

On June 7 and 8, 2000, the Board held a hearing in Torrance. Several entities, including the petitioners, the Regional Water Board, and several environmental groups[7], were designated parties. The evidence from that hearing has been included in the record before the Board. The record for comments on the petition was kept open until the end of the hearing. The parties were allowed to submit post-hearing briefs.[8]

I. BACKGROUND

In prior Orders[9] this Board has explained the need for the municipal storm water programs and the emphasis on BMPs in lieu of numeric effluent limitations. The emphasis for preventing pollution from storm water discharges is still on the development and implementation of effective BMPs, but with the expectation that the level of effort will increase over time. In its Interim Permitting Approach[10], the United States Environmental Protection Agency (U.S. EPA) stated that first-round permits should include BMPs, and expanded or better-tailored BMPs in subsequent permits where necessary to attain water quality standards. Dischargers, consultants, and academic institutions in California and nationwide have conducted numerous studies on the effectiveness of BMPs and appropriate design standards. While many questions are still

[7] The environmental groups are Natural Resources Defense Council, Inc., Santa Monica BayKeeper, and Heal the Bay.

[8] There are several documents that were not timely received and, therefore, are not made a part of the record before the Board. The hearing notice specified that all evidence from parties must be received by May 31, 2000. The Regional Water Board submitted documents on June 6, 2000. The hearing notice specified that policy statements were due by the close of the hearing. Several comment letters were received June 12, 13, and 19, 2000. None of these submittals are a part of the record. The post-hearing briefs were subject to a 10-page limit. The environmental groups submitted objections to the post-hearing brief submitted by the Cities. First, the environmental groups challenge the length of the brief. All briefs were subject to a 10-page limit. The Cities submitted a 10-page brief, with a 22-page attachment showing extensive proposed revisions to the SUSMPs. This submittal violates the page limit, and only the brief is considered part of the record. Second, the environmental groups claim that an e-mail message referred to by the petitioners is subject to attorney-client privilege and should not have been used in this hearing. This e-mail message, from the Regional Water Board's counsel to one of its engineers, was placed in the Regional Water Board's administrative record and submitted to the State Water Board. Any privilege that may have attached to the message has been waived and no longer exists. Finally, the post-hearing brief from the City of Arcadia was received late and will not be considered. Documents submitted late for interim deadlines (such as the deadline for submitting responses to the petitions), have been included in the record.

[9] See, especially Orders WQ 91-03 (In the Matter of Citizens for a Better Environment et al.) and WQ 91-04.

[10] Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. (61 Federal Register 57425.)

outstanding, more is expected of municipal dischargers, and many are implementing more effective programs.

While storm water management plans are improving, our knowledge of the impacts is also growing. Urban runoff has been determined to be a significant contributor of impairment to waters throughout the state. In Los Angeles specifically, beach closures are sometimes associated with urban runoff. In adopting the SUSMPs, the Regional Water Board took note of the urgent need for preventing further pollution from urban runoff and storm water discharges.

It is important to emphasize the role of the SUSMPs within the totality of regulating storm water discharges, and the purpose of these particular control measures. The requirement to prepare SUSMPS was part of the development controls in the permit. In addition to development controls, the permit requires education, public outreach, programs to restrict illicit connections and discharges, and controls on public facilities. In the context of the entire effort required by the permit, the development controls can be seen as preventing the existing situation from becoming worse.

The Final SUSMPs include a list of mandatory BMPs for nine categories of development. There are provisions that are applicable to all categories and lists of BMPs for individual categories. Requirements applicable to all categories include provisions to limit erosion from new development and redevelopment, requirements to conserve natural areas, protection of slopes and channels, and storm drain stenciling. Examples of BMPs specific to categories of discharge include design of loading docks for commercial projects and design of fueling areas for retail gasoline outlets. In most respects, the Final SUSMPs were similar to those proposed by the County. The significant departures were the inclusion of a numeric design standard for structural or treatment control BMPs, and the inclusion of certain types of projects that were not

covered in the County's proposal. The design standard creates objective and measurable criteria for the amount of runoff that must be treated or infiltrated by BMPs.

The record indicates that the purpose of the development controls, including the SUSMPs, is not simply to prevent pollution associated with construction runoff. As the petitioners point out, construction discharges are already subject to this Board's Statewide Construction Permit. The development controls in the SUSMPs, on the other hand, focus on post-construction runoff. They are aimed at limiting not just the pollutants in runoff from the new development, but also the volume of runoff that enters the municipal storm sewer system. By limiting runoff from new development, the SUSMPs prevent increased impacts from urban runoff generally. There is adequate technical information in the record to show that by controlling the volume of runoff from new development, BMPs can be effective in reducing the discharge of pollutants in storm water runoff.

The Procedure for Adopting the SUSMPs

The permit requires a program for controls on Development Planning and Construction. It involved a number of submissions by the County in consultation with the Cities. The first step was submission of a checklist for determining priority projects and exempt projects. The checklist was due on January 30, 1998. A list of recommended BMPs for development projects was also due on that date. The SUSMPs were due within six months of approval of the BMP list, and were to incorporate BMPs for certain categories of development. Following approval of the SUSMPs, the cities and County were to implement development programs for priority projects, consistent with the BMP list and the SUSMPs.

The BMP list was not approved until April 22, 1999. Thereafter, the County submitted proposed SUSMPs on July 22, 1999. The Regional Water Board held a public workshop on

August 10, 1999. Following the workshop, the County submitted revisions to the SUSMPs on August 12, 1999. On August 16, 1999, the Regional water Board gave notice that it would discuss the SUSMPs in a public meeting on September 16, 1999. There was significant discussion at that meeting regarding the intent of the Executive Officer to approve the SUSMPs, but with revisions including a numeric design standard. At the conclusion of the meeting, the Regional Water Board members asked the Executive Officer to revise the SUSMPs and bring them back to another meeting. On December 7, 1999, the Executive Officer circulated revised SUSMPs for public review. This document incorporated a numeric design standard and made other revisions to the permittees' proposal. The Regional Water Board held a hearing on the SUSMPs on January 26, 2000. At that meeting, the Regional Water Board endorsed the SUSMPs revised by the Executive Officer, but directed him to make further changes. The Executive Officer issued the Final SUSMPs on March 8, 2000.

The Contents of the Final SUSMPs

The permit provides that the SUSMPs must incorporate the appropriate elements of the BMP list and, at a minimum, apply to seven development categories: 100-plus home subdivisions; 10-plus home subdivisions; 100,000-plus square foot commercial developments; automotive repair shops; retail gasoline outlets; restaurants; and hillside single-family dwellings.

The SUSMPs proposed by the County applied to these seven categories. Various BMPs applied to the different categories, and the SUSMPs contained narrative mitigation requirements for source control and treatment. The July proposals stated:

> "The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the storm water conveyance system."

There were no numeric design criteria for mitigation. According to various participants, earlier County drafts had included design standards to mitigate flows from 0.6-inch storm events. But any numeric criteria had been removed from the version that was submitted.

In its revised SUSMPs, submitted on August 12, the County explained in its cover letter that the mitigation language did not mean that all runoff must be mitigated. Rather, the County's intent was to omit a numerical standard from the SUSMPs. The revised SUSMPs no longer referred to mitigation at all. Instead, the following language replaced the mitigation requirement:

> "The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official."

The Final SUSMPs, as approved by the Executive Officer and the Regional Water Board, included several revisions from the County's submittal. The revision that is of greatest concern to the petitioners is the addition of Design Standards for Structural or Treatment Control BMPs.[11] The design standards require that developments subject to the SUSMPs shall be designed to mitigate storm water runoff (by treatment or infiltration) from one of the following:

> "1. The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area..., or
> 2. The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment..., or
> 3. The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system, or
> 4. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event."

[11] The Final SUSMPs also include the narrative language quoted from the County's August 22, 1999 proposal.

The Final SUSMPs also applied to two additional categories of development: parking lots over 5,000 square feet or with 25 or more spaces and exposed to storm water, and to developments in environmentally-sensitive areas. Other revisions included application to all projects in the categories instead of discretionary projects only and the definition of redevelopment.

II. CONTENTIONS AND FINDINGS[12]

Contention: The petitioners contend that the Regional Water Board erred in not complying with the Administrative Review Process within the permit, and acted arbitrarily and capriciously and in violation of the Clean Water Act and state law.

Finding: The permit required the County, in consultation with the cities subject to the permit, to submit SUSMPs. The permit includes some general minimum requirements for the SUSMPs.[13] The Executive Officer is granted authority to approve the SUSMPs.[14]

The permit also contains an administrative review process.[15] The permit states that the administrative review process "formalizes the procedure for review and acceptance of reports and documents" and "provides a method to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action."[16] Following this introductory statement, the permit includes two procedures. The first is for review and approval or disapproval of reports and documents. The second is the dispute resolution section that must be followed prior to enforcement action.

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[12] This Order does not address all of the issues raised by the petitioners. The Board finds that the issues that are not addressed are insubstantial and not appropriate for State Water Board review. (See *People v. Barry* (1987) 194 Cal.App.3d 158, [239 Cal.Rptr. 349], Cal. Code Regs., tit. 3, § 052.)
[13] Permit, Part 2, III.A.1.c.
[14] Permit, Part 2, III.A.2.
[15] Permit, Part 2, I.G.
[16] *Id.*

The process for review of documents that are subject to the Executive Officer's approval is that the Executive Officer will notify the permittees of the results of the review and approval or disapproval within 120 days. If the Executive Officer does not do so, the permittees must notify the Regional Water Board of their intent to implement the documents without approval. The Executive Officer then has 10 days to respond, or the permittees may implement the program and the Executive Officer may not make modifications.

The dispute resolution procedure is to be used when the Executive Officer determines that a permittee's storm water program is insufficient to meet the permit's provisions. The Executive Officer must send a "Notice of Intent to Meet and Confer" with the permittee. A meet and confer period then ensues, resulting in a written "Storm Water Program Compliance Amendment (SWPCA)." The permittee is provided time to comply with the SWPCA. The Executive Officer is not allowed to take enforcement action against a permittee until the Executive Officer notifies the permittee in writing that the administrative review process has been exhausted and that a violation exists warranting enforcement.

The petitioners contend that the Executive Officer failed to notify the permittees that their SUSMPs were inadequate within 120 days of its submittal. The petitioners also argue that, by revising the SUSMPs without pursuing the dispute resolution process, the Regional Water Board "violated" the terms of the permit.

The provision for review of documents, which clearly includes the SUSMPs, requires that the Executive Officer notify the permittees of the results of the review and approval or disapproval within 120 days. The County submitted the revised SUSMPs on August 12, 1999. Within 120 days, the Regional Water Board held a workshop where staff expressed their concerns with the SUSMPs. Also within 120 days the Regional Water Board itself held a public

meeting where there was extensive discussion and concern by board members that the SUSMPs did not include a numeric standard. And, prior to any notification by the permittees that they would proceed with implementing their SUSMPs, the Regional Water Board held a hearing January 26, 2000, where it directed the Executive Officer to issue the SUSMPs with revisions. The Executive Officer did so on March 8, 2000.

It is clear from the record that the Executive Officer, and the Regional Water Board itself, did inform the permittees that the SUSMPs were inadequate. There was no requirement for a specific form for expressing disapproval of documents. The extensive discussion and meetings on the need for revisions to the SUSMPs, and the Executive Officer's approval of revised SUSMPs, plainly refutes the allegation that the Regional Water Board never notified the permittees of its disapproval of the County's proposed SUSMPs.

The permittees also claim that the Regional Water Board "violated" the permit by failing to institute the meet and confer process.[17] The dispute resolution process, which includes meet and confer, did not apply to the decision to disapprove the proposed SUSMPs. That process is only required when the Regional Water Board ultimately takes an enforcement action against a permittee. It is separate from the process for review and approval or disapproval of documents, and does not even appear to relate to possible enforcement actions for submission of inadequate documents. This is illustrated by the fact that the provision regarding documents refers to submittals from both the Principal Permittee and the individual permittees, while the dispute resolution provision refers only to the permittees. This distinction is relevant because the County is charged with submitting the documents, while the individual permittees are responsible for compliance. A fair reading of the entire section on the administrative review process is that the

[17] We note that permits are issued to permittees to allow discharges to waters of the state. It is only permittees, and not Regional Water Boards, who can be charged with violating permits.

review and approval or disapproval of documents applies to submission of documents by the County on behalf of the cities, while the dispute resolution process applies to enforcement actions against any permittees for failing to implement adequate programs.

Contention: The petitioners contend that the Regional Water Board was not authorized to revise the SUSMPs to add more stringent requirements.

Finding: The petitioners contend that the mitigation standards in the SUSMPs are more stringent than the requirement in the permit to reduce pollutants in storm water runoff to the maximum extent practicable (MEP)[18]. The issue of what level of protection constitutes MEP will be discussed *Infra*, in the discussion of the reasonableness of the numeric standards. But the petitioners also make certain procedural claims on this point. They argue that in approving the BMP list, the Regional Water Board determined that those BMPs constituted MEP and that the Board could not add additional BMPs in the SUSMPs. They also contend the Regional Water Board itself had no authority to "usurp" the Executive Officer's role in reviewing the SUSMPs.[19] Finally, the petitioners contend that the Regional Water Board was not authorized to mandate a program for the permittees without amending the permit.

The permit requires the County to submit a list of BMPs for approval. The Regional Water Board approved this list. Following approval of the list, the County was required to submit the SUSMPs, which must "incorporate the appropriate elements of the recommended BMPs list."[20] The petitioners contend that by approving the list, the Regional Water Board determined that those BMPs constituted MEP, and that under the terms of the permit the Regional Water Board could not require additional BMPs.

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[18] The technology-based standard for controls under municipal storm water permits is MEP. For a fuller discussion of this standard, see Order WQ 91-03.
[19] It is undisputed that, at its January 26, 2000 meeting, the Board directed the Executive Officer to make additional revisions to the SUSMPs.
[20] Permit, Part 2, III.A.1.c.

In addressing this contention, we face what appears to be a fundamental misunderstanding of the numeric design standards on the part of the petitioners. The design standards are objective criteria that developers must achieve in designing their BMPs. The design standards are not separate BMPs. The standards tell what magnitude of storm event the BMPs must be designed to treat or infiltrate. They do not specify the BMPs that must be employed.

The SUSMPs as submitted by the County specify BMPs for various categories of development. Many of these BMPs are designed to minimize the pollutants in storm water runoff, by reducing flow through infiltration or by treatment. Examples of BMPs proposed by the County include infiltration basins and trenches, oil/water separators, and media filtration. The County's proposed SUSMPs also included language requiring minimizing the introduction of pollutants to the storm water conveyance system. That language remains unchanged in the Final SUSMPs. The only significant difference between the two versions of the SUSMPs was that the Regional Water Board established numeric criteria for designing the BMPs.

In adopting the Final SUSMPs, the Regional Water Board based its decision on the MEP standard.[21] The Regional Water Board did not significantly revise the BMP list or specify further the actions that developers must take to comply with the SUSMPs. Thus, we find that the Regional Water Board did not inappropriately revise its determination of what constituted MEP.

The Regional Water Board is the political body responsible for water quality control in the Los Angeles region.[22] While the Regional Water Board may delegate specified powers and duties to its Executive Officer,[23] it can at any time act on its own behalf. The fact that the Board authorized its Executive Officer to approve the SUSMPs in the permit did not mean that the Board thereby denied itself the opportunity to provide direction to the Executive Officer in his

[21] Resolution R-00-02.
[22] Water Code sections 13200 and 13225.
[23] Water Code section 13223.

approval. Such an interpretation of its delegation authority would result in an improper failure of the Board to assume responsibility for water quality in the region.

We also find that the Regional Water Board was authorized to revise the SUSMPs to achieve compliance with the permit's requirements. The SUSMPs are a part of implementation of the permit. Because the permit regulates storm water discharges throughout the entire Los Angeles region and it is implemented by 85 cities and the County, it is obvious that the permit could not spell out every detail of the program for the five-year term of the permit. Instead, the implementation is through the submission, review and approval, and implementation of various programs, including the SUSMPs.[24] Where it receives a submission that it finds is not consistent with the requirements of the permit, it is reasonable for the Regional Water Board to be able to require revisions. The Regional Water Board is not required to amend the permit each time it approves a submittal or approves a submittal with revisions. On the other hand, if the Regional Water Board's action in requiring revisions is inconsistent with the terms of the permit, then the Board should not act without first amending the permit. While the Regional Water Board could have required the County to make the revisions rather than making them itself, we see no harm in the Regional Water Board's approach.

As will be discussed below, in most respects the Final SUSMPs are consistent with the permit. But there are some portions of the SUSMPs that are not consistent, and in those cases the SUSMPs provisions are further revised in this Order.

Contention: The petitioners make various procedural claims, including that they were denied due process, and that the Regional Water Board violated the Administrative Procedure

[24] A fuller discussion of the use of storm water management plans to incorporate a developing program is found in Order No. WQ 91-03.

Act, the California Environmental Quality Act (CEQA), and the California Constitution, Article XIII B, section 6 (regarding state mandates).

Finding: The petitioners point out that at the January 26, 2000 Regional Water Board hearing, there was some confusion over late changes to the SUSMPs and they contend they were not provided adequate opportunity to comment. There was significant discussion of the SUSMPs over several months. We do not agree with the petitioners that a program of this magnitude must necessarily take years to develop. But we are concerned that at the January 26, 2000 hearing, interested persons and permittees were not given adequate time to review late revisions or to comment on them. Given the intense interest in this issue, the Regional Water Board should have diverged from its strict rule limiting individual speakers to three minutes and should have allowed groups to make joint presentations.[25] But to the extent the Regional Water Board's process caused any harm, this Board cured those harms. We held a two-day hearing in Los Angeles County, where all parties were allowed significant time to present their positions and testimony. In addition, we allowed the introduction of new evidence that had not been presented to the Regional Water Board. At this point, all parties have been afforded a full opportunity to review the Final SUSMPs, to present their positions and evidence, and to engage in cross-examination. The petitioners' due process rights have been protected.

The Board has already addressed the contentions regarding compliance with other laws in prior decisions. The Administrative Procedure Act exempts the adoption of permits from its requirements.[26] While the SUSMPs are not a permit, they are implementing documents for a permit, and are therefore subject to the exemption. Moreover, they are relevant only to this

[25] For future adjudicative proceedings that are highly controversial or involve complex factual or legal issues, we encourage regional water boards to follow the procedures for formal hearings set forth in Cal. Code of Regs., tit. 23, section 648 et seq.

[26] Government Code section 11352; See, Order No. 95-4 (In the Matter of the City and County of San Francisco).

permit, and are not a general rule of application. The constitutional provisions regarding state mandates also do not apply to NPDES permits.[27] As will be explained below, the SUSMPs as revised herein, are consistent with MEP and therefore are federally mandated. The provisions of CEQA requiring adoption of environmental documents also do not apply to NPDES permits.[28] Again, as an implementing document for the permit, there is no requirement for a separate CEQA analysis.[29]

Contention: The petitioners contend that the SUSMPs do not properly apply the maximum extent practicable standard.

Finding: The permit, consistent with Clean Water Act section 402(p)(3)(B)(iii), requires controls to reduce the discharge of pollutants to the maximum extent practicable, or MEP.[30] In approving the Final SUSMPs, the Regional Water Board acknowledged that one of the primary objectives of the municipal storm water program is the requirement to reduce the discharge of pollutants from storm water conveyance systems to the MEP.[31] While all parties appear to agree that the standard for the SUSMPs is MEP, they disagree about what level of effort is necessary to comply with that standard.

The petitioners approach this issue from two angles. First, they contend that the SUSMPs will not provide water quality benefits that reflect MEP. Second, they contend that there could be adverse impacts on groundwater quality that have not been adequately evaluated.

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[27] See, Order No. WQ 90-3 (In the Matter of San Diego Unified Port District).
[28] Water Code section 13389.
[29] We do note with interest the environmental groups' comment that if the permittees believed it was necessary to comply with the APA and CEQA prior to adoption of the SUSMPs, then they themselves would have violated those acts in tl.eir submissions of the proposed SUSMPs.
[30] Permit, Finding 13.
[31] Final SUSMPs, at page 2; Resolution No. R-00-02, at page 3.

Storm Water Design Standards as MEP

In adopting the Final SUSMPs, the Regional Water Board found that many rivers and streams in Los Angeles County are impaired for pollutants found in storm water and urban runoff, and that storm water runoff carries pollutants from nearly all types of developed properties.[32] Pollutant loading from the aggregate of development in the basin results in impairments from sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides.[33] The Final SUSMPs reflect two goals: to reduce the amounts of these pollutants in runoff and to reduce the ability of runoff to act as a conveyance system to deliver more pollutants to receiving waters. The Final SUSMPs, which include lists of BMPs and design standards requiring treatment or infiltration, address these two goals.

Clean Water Act section 402(p)(3)(B)(iii), which sets forth the requirements for establishing MEP in municipal storm water permits, provides that such permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." The United States Environmental Protection Agency (U.S. EPA), in a guidance document, explains that BMPs should be used in first-round storm water permits, and "expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards."[34] The Clean Water Act, as interpreted by U.S. EPA, does require that, in a second-round permit,[35] expanded BMPs may be appropriate. In light of the number of water

[32] Resolution No. R-00-02.
[33] *Id.*
[34] Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, 61 Federal Register 57425 (1996).
[35] The original permit was issued in 1990. The 1996 permit is a second-round permit.

bodies impaired by runoff in Los Angeles County, it was appropriate to expand the scope of BMPs during the permit term.

The regulations implementing section 402(p) specifically require municipalities to have controls to reduce the discharge of pollutants from their storm sewer systems that "receive discharges from areas of new development and significant redevelopment," including post-construction discharges.[36] Clearly, it was appropriate for the Regional Water Board to require BMPs for new development and significant redevelopment. The permittees, who submitted their own version of SUSMPs with listed BMPs for categories of development, appear to have no real quarrel with this general mandate.

This Board has already endorsed requirements to limit the flow of the "first flush" of storm water, which may contain more significant pollutants.[37] The permittees' own version of the SUSMPs required mitigation of storm water runoff by treatment or infiltration, thus conceding the propriety of these two approaches to lessening the impact of storm water discharges. The crux of the disagreement is that the Regional Water Board added numeric design standards to establish the amount of runoff that must be treated or infiltrated, and required the mandatory application of these standards to categories of development.

The addition of measurable standards for designing the BMPs provides additional guidance to developers and establishes a clear target for the development of the BMPs. The U.S. EPA guidance manual suggests the use of design criteria and performance standards for post-construction BMPs.[38] The numeric criteria the Regional Water Board adopted essentially

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[36] 40 CFR section 122.26(d)(2)(iv)(A)(2).
[37] In the Matter of National Steel and Shipbuilding Company, et al., Order WQ 98-07, at slip opinion 7.
[38] Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Strom Sewer Systems, at page 6-4 (November 1992).

requires that 85 percent of the runoff from the development be infiltrated or treated.[39] In adopting these standards, the Regional Water Board based its decision on a research review of standards in other states and a statistical analysis of the rainfall in the area. The standard was set to gain the maximum benefit in mitigation while imposing the least burden on developers.[40] In light of the evidence of the use of this or more stringent standards in other states, the expert testimony supporting this standard, the endorsement by U.S. EPA in its comments, and the cost-effectiveness of its implementation (discussed below), the Regional Water Board acted appropriately in determining that the standards reflect MEP.[41]

We also find that the Regional Water Board appropriately applied these standards to seven of the categories listed in the SUSMPs: single-family hillside residences, 100,000 square foot commercial developments, automotive repair shops, restaurants, home subdivisions with 10 to 99 housing units, home subdivisions with 100 or more housing units, and parking lots with 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff.[42] These categories, except for parking lots, were already targeted for special treatment in the permit. The evidence shows that each listed category can be a significant source of pollutants and/or runoff following development. It is appropriate that the design standards apply so that BMPs for these categories of development result in the infiltration or treatment of a significant about of the runoff.

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[39] Four different methods of calculation are permitted, so the percentage of capture may vary slightly.

[40] At the hearing in this matter, Regional Water Board staff explained that the standard was set at the bottom of the "knee" of the curve where the benefits of the mitigation requirements decrease and the cost increases. Other states have set the standard higher along this curve, requiring 90 to 95 percent mitigation.

[41] This conclusion in no way departs from our acceptance of BMPs in lieu of numeric effluent limitations in storm water permits. (See, e.g., Order WQ 91-03 and Order WQ 91-04.) The numeric standard is a design standard for BMPs. It does not quantify or limit the pollutants in the effluent. It also does not specify which of the listed BMPs must be employed.

[42] As discussed below, this Board is revising the SUSMPs to delete the application of the design standards to retail gasoline outlets and to locations within or directly adjacent to or discharging directly to environmentally-sensitive areas.

Potential Impacts on Ground Water

The petitioners contend that infiltration of runoff may lead to ground water pollution, and that the Regional Water Board did not properly consider such potential impacts. The mitigation standards provide for a waiver where there is a risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than ten feet from the soil surface.[43] The Final SUSMPs also include a discussion on how to use infiltration so that the risk of contamination of groundwater is reduced, and where infiltration is not appropriate.[44]

The Regional Water Board did consider the potential impacts to groundwater from infiltration, and included appropriate limitations and guidance on its use as a BMP. These provisions will ensure adequate protection of groundwater from any adverse impacts due to infiltration.

Contention: The petitioners contend the Regional Water Board failed to show that the SUSMPs as adopted are cost-effective and that the benefits to be obtained outweigh the costs.

Finding: The petitioners refer to the Preamble to the Phase II storm water regulations[45] as the basis for their economic argument. The quoted language, however, does not wholly support the petitioners' contention. The Preamble states that President Clinton's Clean Water Initiative clarifies "that the maximum extent practicable standard should be applied in a site-specific, flexible manner, taking into account cost considerations as well as water quality effects."[46] It is clear that cost should be considered in determining MEP; this does not mean that

[43] Final SUSMP, page 14.
[44] *Id.*, at page 15.
[45] 64 Federal Register 68722 and following. These regulations do not apply to the permit, but the general language on MEP is relevant to EPA's interpretation of the standard.
[46] 64 Federal Register 68722, 68732 (December 8, 1999).

the Regional Water Board must demonstrate that the water quality benefits outweigh the economic costs.

While the standard of MEP is not defined in the storm water regulations or the Clean Water Act, the term has been defined in other federal rules. Probably the most comparable law that uses the term is the Superfund legislation, or CERCLA, at section 121(b). The legislative history of CERCLA indicates that the relevant factors, to determine whether MEP is met in choosing solutions and treatment technologies, include technical feasibility, cost, and state and public acceptance.[47] Another example of a definition of MEP is found in a regulation adopted by the Department of Transportation for onshore oil pipelines. MEP is defined as to "the limits of available technology and the practical and technical limits on a pipeline operator . . . ."[48]

These definitions focus mostly on technical feasibility, but cost is also a relevant factor. There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of BMPs, a permittee chooses only a few of the least expensive methods, it is likely that MEP has not been met. On the other hand, if a permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive. Thus while cost is a factor, the Regional Water Board is not required to perform a cost-benefit analysis.

In reviewing the record, it is apparent that the Regional Water Board did evaluate the cost of the SUSMPs. While the petitioners claim there is no evidence in the record to show the

[47] 132 Cong. Rec. H 9561 (Oct. 8, 1986).
[48] 49 CFR section 194.5.

SUSMPs are necessary and cost effective, the opposite is true. The record is replete with documentation of costs of pilot mitigation projects, studies from similar programs in other states, and research studies. The Regional Water Board complied with the requirement to consider cost.

The Regional Water Board found that the cost to include BMPs that will meet the mitigation criteria will be one to two percent of the total development cost. This amount appears reasonable, especially in light of the amount of impervious surface already in Los Angeles County and the impacts on impaired water bodies. In considering the cost of compliance, it is also important to consider the costs of impairment. The beach closures in the Los Angeles region, well documented in the evidence, have reached critical proportions. These beach closures clearly have a financial impact on the area, and should be positively affected by the SUSMPs.

We do note that there could be further cost savings for developers if the permittees develop a regional solution for the problem. We recommend that the cities and the County, along with other interested agencies, work to develop regional solutions so that individual dischargers are not forced to create numerous small-scale projects. While the SUSMPs are an appropriate means of requiring mitigation of storm water discharges, we also encourage innovative regional approaches.

Contention: The petitioners have raised contentions regarding details of the SUSMPs, including the amount of time allowed for inclusion of SUSMPs in local ordinances, and their application to both "discretionary" and "non-discretionary" projects. In addition, during the hearing certain ambiguities in the wording of the Final SUSMPs became apparent, including the provisions regarding redevelopment and environmentally-sensitive areas. In this portion of the

Order we address these issues and also the application of the design standards to retail gasoline outlets (RGOs) and the waiver funding requirements.

Finding: The testimony at the hearing in this matter revealed that there are specific provisions of the SUSMPs that create confusion as to the types of development projects subject to the mitigation design standards. The petitioners also contend that application of the standards to specific types of development either is unreasonable or is inconsistent with the terms of the permit. The specific requirements are discussed below.

Retail Gasoline Outlets

Petitioner WSPA contends that RGOs should be excluded from the SUSMPs. Its petition raised the same general contentions as the other petitioners, but at the hearing WSPA presented evidence specific to RGOs. In particular, WSPA raised questions about the propriety of applying the design standards for BMPs to RGOs. In considering this issue, we conclude that construction of RGOs is already heavily regulated and that owners may be limited in their ability to construct infiltration facilities. Moreover, in light of the small size of most RGOs, treatment also may not be feasible, or safe. The mandatory BMPs that are included in the SUSMPs should be adequate to achieve MEP at RGOs.[49] We conclude that RGOs should not be subject to the BMP design standards because they are already heavily regulated and may be limited in their ability to construct infiltration facilities or to perform treatment.

Redevelopment Projects

The SUSMPs were written to apply to new development and to some types of redevelopment in nine categories of projects. The definition of "redevelopment" reflected the intent of the Regional Water Board to define the scope of redevelopment projects subject to the

[49] WSPA also refers to the list of BMI s in a publication of the California Storm Water Quality Task Force. (Best Management Practice Guide – Retail Gasoline Outlets. March 1997.) This publication includes BMPs in addition to those listed in the SUSMPs, which should be considered for inclusion therein.

requirements. That definition[50], however, was somewhat confusing, and it was apparent from testimony at the hearing that the parties had different understandings of the scope of redevelopment subject to the SUSMPs. In their post-hearing briefs, the various parties appeared to agree on the actual intent of the Regional Water Board in including redevelopment in the SUSMPs. This intent was to include redevelopment that adds or creates at least 5,000 square feet of impervious surface to the original development and, where the addition constitutes less than 50 percent of the original development, to limit the application of the BMP design standards to the addition.

While some parties requested further requirements for development, it appears that the Regional Water Board's original intent was relatively simple to apply and results in a fair and appropriate application of the SUSMPs' requirements to redevelopment. Therefore, we will revise the definition in the SUSMPs accordingly.

Environmentally-Sensitive Areas

The permit required that the SUSMPs address at least seven development categories.[51] The final SUSMPs added two more categories: parking lots of 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff; and location within or directly adjacent to an environmentally-sensitive area (ESA). The petitioners contend that the

[50] The SUSMPs state: "Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces.

[51] The categories listed in the permit are: single-family hill residences, 100,000 . quare-foot commercial developments, automotive repair shops, retail gasoline outlets, restaurants, home subdivisions with 10 to 99 housing units, and home subdivisions with 100 or more housing units. Permit, Part 2, III.A.1.c.

addition of ESAs was inappropriate because the permit refers only to "development categories"[52] and ESA is a location category.

Whether or not the Regional Water Board went beyond the permit's terms in including this category, we find a fundamental problem with the language of the SUSMPs regarding ESAs. All of the other categories are relatively simple to apply because they describe the types of development that fall within the category. For instance, the threshold for a commercial development is 100,000 square feet. If the development is smaller, it is not subject to the SUSMPs. But for developments within ESAs, the SUSMPs contain no threshold. This absence led to speculation by the petitioners that something as small as a new patio on a home in an ESA would make the SUSMPs applicable. The Regional Water Board, at the hearing and in its post-hearing brief, conceded that there should be some threshold. While the Regional Water Board did recommend a specific threshold, we believe that it is inappropriate for this Board to add a threshold that has not been fully discussed by all interested persons.

While it may be appropriate to include more stringent controls for developments in ESAs, we also note that such developments are already subject to extensive regulation under other regulatory programs. Moreover, in light of the permit language limiting the SUSMPs to development categories, ESAs are not an appropriate category within the SUSMPs. The Regional Water Board may choose to consider the issue further when it reissues the permit.

Discretionary and Non-Discretionary, or Ministerial, Projects

The petitioners contend that the SUSMPs should apply only to projects that are considered "discretionary" within the meaning of California Environmental Quality Act

[52] *Id.*

(CEQA).[53] They argue that the inclusion of non-discretionary, or ministerial, projects is inconsistent with the terms of the permit.

The permit provisions on development projects do refer to "discretionary" projects in several places. The permittees are directed to develop a checklist for determining priority and exempt projects.[54] Priority projects are defined as development and redevelopment projects requiring discretionary approval, which may have a potential significant effect on storm water quality.[55] The permittees are also required to develop a BMP list.[56] In developing the SUSMPs, the permittees are required to incorporate appropriate elements of the BMP list.[57] Next, the permittees must develop a program on planning control measures for priority projects (which are limited to projects requiring discretionary approval), consistent with the list of BMPs and the SUSMPs.[58] The permit further states that, in order to assure compliance with these requirements, the permittees must develop guidelines on preparing CEQA documents that link mitigation conditions to "local discretionary project approvals."[59]

Taken as a whole, the provisions of the permit appear to link the development requirements for SUSMPs to developments that receive discretionary approval by local governments, as defined in CEQA. The SUSMPs are an implementation tool for the permit and must be consistent with the permit. While the limitation of the SUSMPs to discretionary projects may not be sufficiently broad for an effective storm water control program, the Regional Water Board acted inappropriately in expanding the SUSMPs to include non-discretionary projects. The Regional Water Board may consider expanding the development controls beyond CEQA

[53] Public Resources Code section 21000 *et seq.*
[54] Permit, Part 2, III.A.1.a.
[55] *Id.*
[56] Permit, Part 2, III.A.1.b.
[57] Permit, Part 2, III.A.1.c.
[58] Permit, Part 2, III.a.2.
[59] Permit, Part 2, III.a.3.b.

discretionary projects when it reissues the permit. But at this time, the SUSMPs must be revised so that they are limited to development projects requiring discretionary approval within the meaning of CEQA.[60]

Waiver Funding Requirement

Where a waiver is granted from the design standard requirements, the Final SUSMPs provide that the permittee must require the project proponent to transfer the cost savings to a storm water mitigation fund. The fund is to be operated by a public agency or a non-profit entity, to promote regional or alternative solutions for storm water pollution in the same storm watershed. The petitioners contend that the funding requirement will create an additional administrative burden.

The concept of a mitigation fund or "bank" is a positive idea for obtaining regional solutions to storm water runoff. As a long-term strategy, municipal storm water dischargers should work to establish regional mitigation facilities, which may be more cost-effective and more technically effective than mitigation structures at individual developments. But at this point there are not sufficient resources in place to require all permittees to establish such funds or to find appropriate non-profit organizations. Before mandating funding, preliminary questions should be answered, including who will manage the fund, what types of projects it will be used for, what entities can legally operate such funds, and how permittees will determine the amount of the assessments. It would be appropriate for the County to consider developing a program with the appropriate flood control agency, or as a model for the separate cities to develop. There may be suitable agencies to administer such funds, but the development of programs may take

[60] We note that the Final SUSMPs already include a definition of "discretionary project" consistent with the definition in the CEQA guidelines. Final SUSMPs at page 4 of 25; Title 14, California Code of Regulations, section 15357. Apparently this definition was inadvertently retained after the Regional Water Board decided to expand the SUSMPs beyond discretionary projects.

some time. The Regional Water Board should consider adopting such a program when it reissues the permit, after consultation with the appropriate local agencies.

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R0072444

III. CONCLUSIONS

Based on the discussion above, the Board concludes that:

1. The Regional Water Board complied with the procedural requirements of the permit, including the Administrative Review Process, in approving the Final SUSMPs.
2. The Regional Water Board was authorized to revise the SUSMPs by including more stringent requirements than the permittees had proposed.
3. The Regional Water Board complied with did not violate the Administrative Procedure Act, CEQA, or the Constitutional provisions on state mandates. The petitioners' due process rights have been protected
4. The Regional Water Board considered the costs of the SUSMPs, and acted reasonably in requiring these controls in light of the expected benefits to water quality.
5. The Final SUSMPs reflect a reasonable interpretation of development controls that achieve reduction of pollutants in storm water discharges to the maximum extent practicable.
6. The SUSMPs include adequate protections of groundwater quality from any impacts from infiltration.
7. The SUSMPs will be revised to clarify the intent of the Regional Water Board and to make them consistent with the permit. Specifically, retail gasoline outlets should not be subject to the BMP design standards because they are already heavily regulated and may be limited in their ability to construct infiltration facilities or to perform treatment. Redevelopment projects should be subject to the SUSMPs only if they result in creation or addition of 5,000 square feet of impervious surfaces. Environmentally-sensitive areas should not be listed as a category in the SUSMPs. The SUSMPs should only apply to discretionary projects. The requirement for funding by project proponents who receive waivers should be deleted. The SUSMPs will be amended as shown in the attachment to this Order.

R0072445

8. In light of the revisions of the SUSMPs made by this Order, and to allow the permittees adequate time to adopt implementing ordinances, the deadline for adopting ordinances will be revised to January 15, 2001, and the effective date of the Final SUSMPs will be revised to February 15, 2001.

IV. ORDER

IT IS HEREBY ORDERED that the Standard Urban Storm Water Mitigation Plans for Los Angeles County and Cities in Los Angeles County is revised consistent with the amendments attached hereto. In all other respects the petitions are dismissed.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on August 17, 2000.

AYE:

NO:

ABSENT:

ABSTAIN:

_____
Maureen Marché
Administrative Assistant to the Board

D • R • A • F • T

August 10, 2000

AMENDMENTS TO SUSMPS

[These amendments are to the Final SUSMP, as published March 8, 2000]

Page 3 of 25

First full paragraph:

All **discretionary development and redevelopment** projects that fall into one of ~~seven~~ **the following** categories are ~~identified in the Los Angeles County MS4 Permit as requiring~~ **subject to these** SUSMPs. These categories are:

- Single-family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units
- **Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff**

Second full paragraph:

~~The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements for the Los Angeles County MS4 Permit. These categories are:~~

- ~~Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and~~
- ~~Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff~~

Fourth full paragraph:

Permittees shall amend codes not later than ~~September 8, 2000~~ **January 15, 2001**, to give legal effect to the SUSMP requirements. The SUSMP requirements for projects identified herein shall take effect not later than ~~October 8, 2000~~ **February 15, 2001**.

Page 4 of 25

Delete definition of "Environmentally Sensitive Area"

Revise Definition of "Redevelopment":

"Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces ~~or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure~~. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routing maintenance activity; and land disturbing activities related with structural or impervious surfaces. **Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to these SUSMPs, the Design Standards apply only to the addition, and not to the entire development.**

Page 10 of 25

Add to "Limited Exclusion": Retail Gasoline Outlets

Page 15 of 25

Delete the first full paragraph (storm water mitigation funding)

Petitions of the Cities of Artesia, et al., the City of Arcadia, and Western States Petroleum Association

SWRCB/OCC Files A-1280, A-1280a &A-1280b

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STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING SESSION -- OFFICE OF CHIEF COUNSEL
October 5, 2000

ITEM 16

SUBJECT

IN THE MATTER OF THE PETITIONS OF THE CITIES OF BELLFLOWER, ET AL., THE CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION FOR REVIEW OF THE JANUARY 26, 2000 ACTION OF THE REGIONAL BOARD AND ACTIONS AND FAILURES TO ACT BY BOTH THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054. PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUN-OFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]. SWRCB/OCC FILES A-1280, A-1280(a), and A-1280(b).

LOCATION

Los Angeles

DISCUSSION

The Los Angeles Regional Water Quality Control Board adopted Standard Urban Storm Water Mitigation Plans (SUSMPs) for certain development projects in Los Angeles County. Several petitioners, including 32 cities, the Building Industry Association, and Western States Petroleum Association, filed petitions challenging the SUSMPs. In particular, the petitioners seek review of the requirements in the SUSMPs to mitigate storm water runoff from developments by treatment or infiltration.

POLICY ISSUE

Should the Board approve the SUSMPs, while revising the types of development that are subject to the mitigation requirements?

FISCAL IMPACT

This activity is budgeted within existing resources and no additional fiscal demands will occur as a result of approving this item.

RWQCB IMPACT

The Regional Water Board is not required to take any further action.

STAFF RECOMMENDATION

Adopt the draft order approving the SUSMPs, but revising the types of development subject to the mitigation requirements.

Policy Review: _____

Legal Review: _____

Fiscal Review: _____

D R A F T September 21, 2000

STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 2000-

In the Matter of the Petitions of
THE CITIES OF BELLFLOWER, ET AL., THE CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION
Review of January 26, 2000 Action of the Regional Board
and
Actions and Failures to Act
by both the
California Regional Water Quality Control Board,
Los Angeles Region and Its Executive Officer
Pursuant to Order No. 96-054,
Permit for Municipal Storm Water and Urban Run-Off Discharges Within
Los Angeles County
[NPDES NO. CAS614001]

SWRCB/OCC FILES A-1280, A-1280(a) and A-1280(b)

BY THE BOARD:

On July 15, 1996, the Los Angeles Regional Water Quality Control Board (Regional Water Board) issued a revised national pollutant discharge elimination system (NPDES) permit in Order No. 96-054 (permit) to the 85 incorporated cities and the county within Los Angeles County (the County).[1] The permit covers storm water discharges from municipal separate storm sewer systems throughout the County.[2]

[1] This was the second storm water permit adopted for Los Angeles County and its cities. The first permit was the subject of an earlier Order. (In the Matter of Natural Resources Defense Council, Inc., Order WQ 91-04). In this permit, the County is designated as the Principal Permittee, and each city is designated as a permittee. The County is required to submit various documents on behalf of all of the permittees.
[2] The Regional Water Board has since issued a separate permit for one city, Long Beach. The relevant provisions of the Long Beach permit are similar to those in Order No. 96-054.

The permit contains provisions for the regulation of storm water discharges from development planning and construction.[3] Pursuant to these provisions, the County was required to submit Standard Urban Storm Water Mitigation Plans (SUSMPs).[4] The SUSMPs are plans that designate best management practices (BMPs) that must be used in specified categories of development projects. The County submitted SUSMPs, but the Regional Water Board approved the SUSMPs only after making revisions. The Executive Officer issued the revised SUSMPs on March 8, 2000.[5]

On February 25, 2000, the State Water Resources Control Board (State Water Board or Board) received a petition for review of the actions and failures to act regarding the SUSMPs from a number of cities, the Building Industry Association of Southern California and the Building Industry Legal Defense Foundation (jointly referred to as Cities). A second petition was received from the City of Arcadia. And a third petition was received from the Western States Petroleum Association (WSPA). On April 7, 2000, the petitioners filed amendments to their petitions, concerning the March 8, 2000 issuance of the SUSMPs. The Cities' amendment also revised the list of cities included in the petition. The Cities' petition now includes 32 cities. The petitions are legally and factually related, and have therefore been consolidated for purposes of review.[6] The petitioners also requested a stay of the SUSMPs. This request was denied by letter, dated May 11, 2000.

[3] Permit, Part 2.III. These provisions focus more on post-construction impacts of development than on discharges from construction activities.
[4] Permit, Part 2.III.A.1.c.
[5] These are referred to herein as the Final SUSMPs. The Final SUSMPs also apply to Long Beach, even though it is subject to a separate permit.
[6] Cal. Code of Regs., tit. 23, section 2054.

On June 7 and 8, 2000, the Board held a hearing in Torrance. Several entities, including the petitioners, the Regional Water Board, and several environmental groups[7], were designated parties. The evidence from that hearing has been included in the record before the Board. The record for comments on the petition was kept open until the end of the hearing. The parties were allowed to submit post-hearing briefs.[8]

I. BACKGROUND

In prior Orders[9] this Board has explained the need for the municipal storm water programs and the emphasis on BMPs in lieu of numeric effluent limitations. The emphasis for preventing pollution from storm water discharges is still on the development and implementation of effective BMPs, but with the expectation that the level of effort will increase over time. In its Interim Permitting Approach[10], the United States Environmental Protection Agency (U.S. EPA) stated that first-round permits should include BMPs, and expanded or better-tailored BMPs in subsequent permits where necessary to attain water quality standards. Dischargers, consultants, and academic institutions in California and nationwide have conducted numerous studies on the effectiveness of BMPs and appropriate design standards. While many questions are still

[7] The environmental groups are Natural Resources Defense Council, Inc., Santa Monica BayKeeper, and Heal the Bay.

[8] There are several documents that were not timely received and, therefore, are not made a part of the record before the Board. The hearing notice specified that all evidence from parties must be received by May 31, 2000. The Regional Water Board submitted documents on June 6, 2000. The hearing notice specified that policy statements were due by the close of the hearing. Several comment letters were received June 12, 13, and 19, 2000. None of these submittals are a part of the record. The post-hearing briefs were subject to a 10-page limit. The environmental groups submitted objections to the post-hearing brief submitted by the Cities. First, the environmental groups challenge the length of the brief. All briefs were subject to a 10-page limit. The Cities submitted a 10-page brief, with a 22-page attachment showing extensive proposed revisions to the SUSMPs. This submittal violates the page limit, and only the brief is considered part of the record. Second, the environmental groups claim that an e-mail message referred to by the petitioners is subject to attorney-client privilege and should not have been used in this hearing. This e-mail message, from the Regional Water Board's counsel to one of its engineers, was placed in the Regional Water Board's administrative record and submitted to the State Water Board. Any privilege that may have attached to the message has been waived and no longer exists. Finally, the post-hearing brief from the City of Arcadia was received late and will not be considered. Documents submitted late for interim deadlines (such as the deadline for submitting responses to the petitions), have been included in the record.

[9] See, especially Orders WQ 91-03 (In the Matter of Citizens for a Better Environment et al.) and WQ 91-04.

[10] Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits. (61 Federal Register 57425.)

outstanding, more is expected of municipal dischargers, and many are implementing more effective programs.

While storm water management plans are improving, our knowledge of the impacts is also growing. Urban runoff has been determined to be a significant contributor of impairment to waters throughout the state. In Los Angeles specifically, beach closures are sometimes associated with urban runoff. In adopting the SUSMPs, the Regional Water Board took note of the urgent need for preventing further pollution from urban runoff and storm water discharges.

It is important to emphasize the role of the SUSMPs within the totality of regulating storm water discharges, and the purpose of these particular control measures. The requirement to prepare SUSMPS was part of the development controls in the permit. In addition to development controls, the permit requires education, public outreach, programs to restrict illicit connections and discharges, and controls on public facilities. In the context of the entire effort required by the permit, the development controls can be seen as preventing the existing situation from becoming worse.

The Final SUSMPs include a list of mandatory BMPs for nine categories of development. There are provisions that are applicable to all categories and lists of BMPs for individual categories. Requirements applicable to all categories include provisions to limit erosion from new development and redevelopment, requirements to conserve natural areas, protection of slopes and channels, and storm drain stenciling. Examples of BMPs specific to categories of discharge include design of loading docks for commercial projects and design of fueling areas for retail gasoline outlets. In most respects, the Final SUSMPs were similar to those proposed by the County. The significant departures were the inclusion of a numeric design standard for structural or treatment control BMPs, and the inclusion of certain types of projects that were not

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covered in the County's proposal. The design standard creates objective and measurable criteria for the amount of runoff that must be treated or infiltrated by BMPs.

The record indicates that the purpose of the development controls, including the SUSMPs, is not simply to prevent pollution associated with construction runoff. As the petitioners point out, construction discharges are already subject to this Board's Statewide Construction Permit. The development controls in the SUSMPs, on the other hand, focus on post-construction runoff. They are aimed at limiting not just the pollutants in runoff from the new development, but also the volume of runoff that enters the municipal storm sewer system. By limiting runoff from new development, the SUSMPs prevent increased impacts from urban runoff generally. There is adequate technical information in the record to show that by controlling the volume of runoff from new development, BMPs can be effective in reducing the discharge of pollutants in storm water runoff.

The Procedure for Adopting the SUSMPs

The permit requires a program for controls on Development Planning and Construction. It involved a number of submissions by the County in consultation with the Cities. The first step was submission of a checklist for determining priority projects and exempt projects. The checklist was due on January 30, 1998. A list of recommended BMPs for development projects was also due on that date. The SUSMPs were due within six months of approval of the BMP list, and were to incorporate BMPs for certain categories of development. Following approval of the SUSMPs, the cities and County were to implement development programs for priority projects, consistent with the BMP list and the SUSMPs.

The BMP list was not approved until April 22, 1999. Thereafter, the County submitted proposed SUSMPs on July 22, 1999. The Regional Water Board held a public workshop on

August 10, 1999. Following the workshop, the County submitted revisions to the SUSMPs on August 12, 1999. On August 16, 1999, the Regional water Board gave notice that it would discuss the SUSMPs in a public meeting on September 16, 1999. There was significant discussion at that meeting regarding the intent of the Executive Officer to approve the SUSMPs, but with revisions including a numeric design standard. At the conclusion of the meeting, the Regional Water Board members asked the Executive Officer to revise the SUSMPs and bring them back to another meeting. On December 7, 1999, the Executive Officer circulated revised SUSMPs for public review. This document incorporated a numeric design standard and made other revisions to the permittees' proposal. The Regional Water Board held a hearing on the SUSMPs on January 26, 2000. At that meeting, the Regional Water Board endorsed the SUSMPs revised by the Executive Officer, but directed him to make further changes. The Executive Officer issued the Final SUSMPs on March 8, 2000.

The Contents of the Final SUSMPs

The permit provides that the SUSMPs must incorporate the appropriate elements of the BMP list and, at a minimum, apply to seven development categories: 100-plus home subdivisions; 10-plus home subdivisions; 100,000-plus square foot commercial developments; automotive repair shops; retail gasoline outlets; restaurants; and hillside single-family dwellings.

The SUSMPs proposed by the County applied to these seven categories. Various BMPs applied to the different categories, and the SUSMPs contained narrative mitigation requirements for source control and treatment. The July proposals stated:

> "The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the storm water conveyance system."

There were no numeric design criteria for mitigation. According to various participants, earlier County drafts had included design standards to mitigate flows from 0.6-inch storm events. But any numeric criteria had been removed from the version that was submitted.

In its revised SUSMPs, submitted on August 12, the County explained in its cover letter that the mitigation language did not mean that all runoff must be mitigated. Rather, the County's intent was to omit a numerical standard from the SUSMPs. The revised SUSMPs no longer referred to mitigation at all. Instead, the following language replaced the mitigation requirement:

> "The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official."

The Final SUSMPs, as approved by the Executive Officer and the Regional Water Board, included several revisions from the County's submittal. The revision that is of greatest concern to the petitioners is the addition of Design Standards for Structural or Treatment Control BMPs.[11] The design standards require that developments subject to the SUSMPs shall be designed to mitigate storm water runoff (by treatment or infiltration) from one of the following:

> "1. The 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area..., or
> 2. The volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment..., or
> 3. The volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system, or
> 4. The volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event."

[11] The Final SUSMPs also include the narrative language quoted from the County's August 22, 1999 proposal.

The Final SUSMPs also applied to two additional categories of development: parking lots over 5,000 square feet or with 25 or more spaces and exposed to storm water, and to developments in environmentally-sensitive areas. Other revisions included application to all projects in the categories instead of discretionary projects only and the definition of redevelopment.

II. CONTENTIONS AND FINDINGS[12]

Contention: The petitioners contend that the Regional Water Board erred in not complying with the Administrative Review Process within the permit, and acted arbitrarily and capriciously and in violation of the Clean Water Act and state law.

Finding: The permit required the County, in consultation with the cities subject to the permit, to submit SUSMPs. The permit includes some general minimum requirements for the SUSMPs.[13] The Executive Officer is granted authority to approve the SUSMPs.[14]

The permit also contains an administrative review process.[15] The permit states that the administrative review process "formalizes the procedure for review and acceptance of reports and documents" and "provides a method to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action."[16] Following this introductory statement, the permit includes two procedures. The first is for review and approval or disapproval of reports and documents. The second is the dispute resolution section that must be followed prior to enforcement action.

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[12] This Order does not address all of the issues raised by the petitioners. The Board finds that the issues that are not addressed are insubstantial and not appropriate for State Water Board review. (See *People v. Barry* (1987) 194 Cal.App.3d 158, [239 Cal.Rptr. 349], Cal. Code Regs., tit. 3, § 052.)
[13] Permit, Part 2, III.A.1.c.
[14] Permit, Part 2, III.A.2.
[15] Permit, Part 2, I.G.
[16] *Id.*

The process for review of documents that are subject to the Executive Officer's approval is that the Executive Officer will notify the permittees of the results of the review and approval or disapproval within 120 days. If the Executive Officer does not do so, the permittees must notify the Regional Water Board of their intent to implement the documents without approval. The Executive Officer then has 10 days to respond, or the permittees may implement the program and the Executive Officer may not make modifications.

The dispute resolution procedure is to be used when the Executive Officer determines that a permittee's storm water program is insufficient to meet the permit's provisions. The Executive Officer must send a "Notice of Intent to Meet and Confer" with the permittee. A meet and confer period then ensues, resulting in a written "Storm Water Program Compliance Amendment (SWPCA)." The permittee is provided time to comply with the SWPCA. The Executive Officer is not allowed to take enforcement action against a permittee until the Executive Officer notifies the permittee in writing that the administrative review process has been exhausted and that a violation exists warranting enforcement.

The petitioners contend that the Executive Officer failed to notify the permittees that their SUSMPs were inadequate within 120 days of its submittal. The petitioners also argue that, by revising the SUSMPs without pursuing the dispute resolution process, the Regional Water Board "violated" the terms of the permit.

The provision for review of documents, which clearly includes the SUSMPs, requires that the Executive Officer notify the permittees of the results of the review and approval or disapproval within 120 days. The County submitted the revised SUSMPs on August 12, 1999. Within 120 days, the Regional Water Board held a workshop where staff expressed their concerns with the SUSMPs. Also within 120 days the Regional Water Board itself held a public

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meeting where there was extensive discussion and concern by board members that the SUSMPs did not include a numeric standard. And, prior to any notification by the permittees that they would proceed with implementing their SUSMPs, the Regional Water Board held a hearing January 26, 2000, where it directed the Executive Officer to issue the SUSMPs with revisions. The Executive Officer did so on March 8, 2000.

It is clear from the record that the Executive Officer, and the Regional Water Board itself, did inform the permittees that the SUSMPs were inadequate. There was no requirement for a specific form for expressing disapproval of documents. The extensive discussion and meetings on the need for revisions to the SUSMPs, and the Executive Officer's approval of revised SUSMPs, plainly refutes the allegation that the Regional Water Board never notified the permittees of its disapproval of the County's proposed SUSMPs.

The permittees also claim that the Regional Water Board "violated" the permit by failing to institute the meet and confer process.[17] The dispute resolution process, which includes meet and confer, did not apply to the decision to disapprove the proposed SUSMPs. That process is only required when the Regional Water Board ultimately takes an enforcement action against a permittee. It is separate from the process for review and approval or disapproval of documents, and does not even appear to relate to possible enforcement actions for submission of inadequate documents. This is illustrated by the fact that the provision regarding documents refers to submittals from both the Principal Permittee and the individual permittees, while the dispute resolution provision refers only to the permittees. This distinction is relevant because the County is charged with submitting the documents, while the individual permittees are responsible for compliance. A fair reading of the entire section on the administrative review process is that the

[17] We note that permits are issued to permittees to allow discharges to waters of the state. It is only permittees, and not Regional Water Boards, who can be charged with violating permits.

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review and approval or disapproval of documents applies to submission of documents by the County on behalf of the cities, while the dispute resolution process applies to enforcement actions against any permittees for failing to implement adequate programs.

Contention: The petitioners contend that the Regional Water Board was not authorized to revise the SUSMPs to add more stringent requirements.

Finding: The petitioners contend that the mitigation standards in the SUSMPs are more stringent than the requirement in the permit to reduce pollutants in storm water runoff to the maximum extent practicable (MEP)[18]. The issue of what level of protection constitutes MEP will be discussed *Infra*, in the discussion of the reasonableness of the numeric standards. But the petitioners also make certain procedural claims on this point. They argue that in approving the BMP list, the Regional Water Board determined that those BMPs constituted MEP and that the Board could not add additional BMPs in the SUSMPs. They also contend the Regional Water Board itself had no authority to "usurp" the Executive Officer's role in reviewing the SUSMPs.[19] Finally, the petitioners contend that the Regional Water Board was not authorized to mandate a program for the permittees without amending the permit.

The permit requires the County to submit a list of BMPs for approval. The Regional Water Board approved this list. Following approval of the list, the County was required to submit the SUSMPs, which must "incorporate the appropriate elements of the recommended BMPs list."[20] The petitioners contend that by approving the list, the Regional Water Board determined that those BMPs constituted MEP, and that under the terms of the permit the Regional Water Board could not require additional BMPs.

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[18] The technology-based standard for controls under municipal storm water permits is MEP. For a fuller discussion of this standard, see Order WQ 91-03.

[19] It is undisputed that, at its January 26, 2000 meeting, the Board directed the Executive Officer to make additional revisions to the SUSMPs.

[20] Permit, Part 2, III.A.1.c.

In addressing this contention, we face what appears to be a fundamental misunderstanding of the numeric design standards on the part of the petitioners. The design standards are objective criteria that developers must achieve in designing their BMPs. The design standards are not separate BMPs. The standards tell what magnitude of storm event the BMPs must be designed to treat or infiltrate. They do not specify the BMPs that must be employed.

The SUSMPs as submitted by the County specify BMPs for various categories of development. Many of these BMPs are designed to minimize the pollutants in storm water runoff, by reducing flow through infiltration or by treatment. Examples of BMPs proposed by the County include infiltration basins and trenches, oil/water separators, and media filtration. The County's proposed SUSMPs also included language requiring minimizing the introduction of pollutants to the storm water conveyance system. That language remains unchanged in the Final SUSMPs. The only significant difference between the two versions of the SUSMPs was that the Regional Water Board established numeric criteria for designing the BMPs.

In adopting the Final SUSMPs, the Regional Water Board based its decision on the MEP standard.[21] The Regional Water Board did not significantly revise the BMP list or specify further the actions that developers must take to comply with the SUSMPs. Thus, we find that the Regional Water Board did not inappropriately revise its determination of what constituted MEP.

The Regional Water Board is the political body responsible for water quality control in the Los Angeles region.[22] While the Regional Water Board may delegate specified powers and duties to its Executive Officer,[23] it can at any time act on its own behalf. The fact that the Board authorized its Executive Officer to approve the SUSMPs in the permit did not mean that the Board thereby denied itself the opportunity to provide direction to the Executive Officer in his

[21] Resolution R-00-02.
[22] Water Code sections 13200 and 13225.
[23] Water Code section 13223.

approval. Such an interpretation of its delegation authority would result in an improper failure of the Board to assume responsibility for water quality in the region.

We also find that the Regional Water Board was authorized to revise the SUSMPs to achieve compliance with the permit's requirements. The SUSMPs are a part of implementation of the permit. Because the permit regulates storm water discharges throughout the entire Los Angeles region and it is implemented by 85 cities and the County, it is obvious that the permit could not spell out every detail of the program for the five-year term of the permit. Instead, the implementation is through the submission, review and approval, and implementation of various programs, including the SUSMPs.[24] Where it receives a submission that it finds is not consistent with the requirements of the permit, it is reasonable for the Regional Water Board to be able to require revisions. The Regional Water Board is not required to amend the permit each time it approves a submittal or approves a submittal with revisions. On the other hand, if the Regional Water Board's action in requiring revisions is inconsistent with the terms of the permit, then the Board should not act without first amending the permit. While the Regional Water Board could have required the County to make the revisions rather than making them itself, we see no harm in the Regional Water Board's approach.

As will be discussed below, in most respects the Final SUSMPs are consistent with the permit. But there are some portions of the SUSMPs that are not consistent, and in those cases the SUSMPs provisions are further revised in this Order.

Contention: The petitioners make various procedural claims, including that they were denied due process, and that the Regional Water Board violated the Administrative Procedure

[24] A fuller discussion of the use of storm water management plans to incorporate a developing program is found in Order No. WQ 91-03.

Act, the California Environmental Quality Act (CEQA), and the California Constitution, Article XIII B, section 6 (regarding state mandates).

Finding: The petitioners point out that at the January 26, 2000 Regional Water Board hearing, there was some confusion over late changes to the SUSMPs and they contend they were not provided adequate opportunity to comment. There was significant discussion of the SUSMPs over several months. We do not agree with the petitioners that a program of this magnitude must necessarily take years to develop. But we are concerned that at the January 26, 2000 hearing, interested persons and permittees were not given adequate time to review late revisions or to comment on them. Given the intense interest in this issue, the Regional Water Board should have diverged from its strict rule limiting individual speakers to three minutes and should have allowed groups to make joint presentations.[25] But to the extent the Regional Water Board's process caused any harm, this Board cured those harms. We held a two-day hearing in Los Angeles County, where all parties were allowed significant time to present their positions and testimony. In addition, we allowed the introduction of new evidence that had not been presented to the Regional Water Board. At this point, all parties have been afforded a full opportunity to review the Final SUSMPs, to present their positions and evidence, and to engage in cross-examination. The petitioners' due process rights have been protected.

The Board has already addressed the contentions regarding compliance with other laws in prior decisions. The Administrative Procedure Act exempts the adoption of permits from its requirements.[26] While the SUSMPs are not a permit, they are implementing documents for a permit, and are therefore subject to the exemption. Moreover, they are relevant only to this

[25] For future adjudicative proceedings that are highly controversial or involve complex factual or legal issues, we encourage regional water boards to follow the procedures for formal hearings set forth in Cal. Code of Regs., tit. 23, section 648 et seq.

[26] Government Code section 11352; See, Order No. 95-4 (In the Matter of the City and County of San Francisco).

permit, and are not a general rule of application. The constitutional provisions regarding state mandates also do not apply to NPDES permits.[27] As will be explained below, the SUSMPs as revised herein, are consistent with MEP and therefore are federally mandated. The provisions of CEQA requiring adoption of environmental documents also do not apply to NPDES permits.[28] Again, as an implementing document for the permit, there is no requirement for a separate CEQA analysis.[29]

Contention: The petitioners contend that the SUSMPs do not properly apply the maximum extent practicable standard.

Finding: The permit, consistent with Clean Water Act section 402(p)(3)(B)(iii), requires controls to reduce the discharge of pollutants to the maximum extent practicable, or MEP.[30] In approving the Final SUSMPs, the Regional Water Board acknowledged that one of the primary objectives of the municipal storm water program is the requirement to reduce the discharge of pollutants from storm water conveyance systems to the MEP.[31] While all parties appear to agree that the standard for the SUSMPs is MEP, they disagree about what level of effort is necessary to comply with that standard.

The petitioners approach this issue from two angles. First, they contend that the SUSMPs will not provide water quality benefits that reflect MEP. Second, they contend that there could be adverse impacts on groundwater quality that have not been adequately evaluated.

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[27] See, Order No. WQ 90-3 (In the Matter of San Diego Unified Port District).
[28] Water Code section 13389.
[29] We do note with interest the environmental groups' comment that if the permittees believed it was necessary to comply with the APA and CEQA prior to adoption of the SUSMPs, then they themselves would have violated those acts in their submissions of the proposed SUSMPs.
[30] Permit, Finding 13.
[31] Final SUSMPs, at page 2; Resolution No. R-00-02, at page 3.

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Storm Water Design Standards as MEP

In adopting the Final SUSMPs, the Regional Water Board found that many rivers and streams in Los Angeles County are impaired for pollutants found in storm water and urban runoff, and that storm water runoff carries pollutants from nearly all types of developed properties.[32] Pollutant loading from the aggregate of development in the basin results in impairments from sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides.[33] The Final SUSMPs reflect two goals: to reduce the amounts of these pollutants in runoff and to reduce the ability of runoff to act as a conveyance system to deliver more pollutants to receiving waters. The Final SUSMPs, which include lists of BMPs and design standards requiring treatment or infiltration, address these two goals.

Clean Water Act section 402(p)(3)(B)(iii), which sets forth the requirements for establishing MEP in municipal storm water permits, provides that such permits "shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." The United States Environmental Protection Agency (U.S. EPA), in a guidance document, explains that BMPs should be used in first-round storm water permits, and "expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards."[34] The Clean Water Act, as interpreted by U.S. EPA, does require that, in a second-round permit,[35] expanded BMPs may be appropriate. In light of the number of water

[32] Resolution No. R-00-02.
[33] *Id.*
[34] Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits, 61 Federal Register 57425 (1996).
[35] The original permit was issued in 1990. The 1996 permit is a second-round permit.

bodies impaired by runoff in Los Angeles County, it was appropriate to expand the scope of BMPs during the permit term.

The regulations implementing section 402(p) specifically require municipalities to have controls to reduce the discharge of pollutants from their storm sewer systems that "receive discharges from areas of new development and significant redevelopment," including post-construction discharges.[36] Clearly, it was appropriate for the Regional Water Board to require BMPs for new development and significant redevelopment. The permittees, who submitted their own version of SUSMPs with listed BMPs for categories of development, appear to have no real quarrel with this general mandate.

This Board has already endorsed requirements to limit the flow of the "first flush" of storm water, which may contain more significant pollutants.[37] The permittees' own version of the SUSMPs required mitigation of storm water runoff by treatment or infiltration, thus conceding the propriety of these two approaches to lessening the impact of storm water discharges. The crux of the disagreement is that the Regional Water Board added numeric design standards to establish the amount of runoff that must be treated or infiltrated, and required the mandatory application of these standards to categories of development.

The addition of measurable standards for designing the BMPs provides additional guidance to developers and establishes a clear target for the development of the BMPs. The U.S. EPA guidance manual suggests the use of design criteria and performance standards for post-construction BMPs.[38] The numeric criteria the Regional Water Board adopted essentially

[36] 40 CFR section 122.26(d)(2)(iv)(A)(2).
[37] In the Matter of National Steel and Shipbuilding Company, et al., Order WQ 98-07, at slip opinion 7.
[38] Guidance Manual for the Preparation of Part 2 of the NPDES Permit Applications for Discharges from Municipal Separate Strom Sewer Systems, at page 6-4 (November 1992).

requires that 85 percent of the runoff from the development be infiltrated or treated.[39] In adopting these standards, the Regional Water Board based its decision on a research review of standards in other states and a statistical analysis of the rainfall in the area. The standard was set to gain the maximum benefit in mitigation while imposing the least burden on developers.[40] In light of the evidence of the use of this or more stringent standards in other states, the expert testimony supporting this standard, the endorsement by U.S. EPA in its comments, and the cost-effectiveness of its implementation (discussed below), the Regional Water Board acted appropriately in determining that the standards reflect MEP.[41]

We also find that the Regional Water Board appropriately applied these standards to seven of the categories listed in the SUSMPs: single-family hillside residences, 100,000 square foot commercial developments, automotive repair shops, restaurants, home subdivisions with 10 to 99 housing units, home subdivisions with 100 or more housing units, and parking lots with 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff.[42] These categories, except for parking lots, were already targeted for special treatment in the permit. The evidence shows that each listed category can be a significant source of pollutants and/or runoff following development. It is appropriate that the design standards apply so that BMPs for these categories of development result in the infiltration or treatment of a significant about of the runoff.

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[39] Four different methods of calculation are permitted, so the percentage of capture may vary slightly.

[40] At the hearing in this matter, Regional Water Board staff explained that the standard was set at the bottom of the "knee" of the curve where the benefits of the mitigation requirements decrease and the cost increases. Other states have set the standard higher along this curve, requiring 90 to 95 percent mitigation.

[41] This conclusion in no way departs from our acceptance of BMPs in lieu of numeric effluent limitations in storm water permits. (See, e.g., Order WQ 91-03 and Order WQ 91-04.) The numeric standard is a design standard for BMPs. It does not quantify or limit the pollutants in the effluent. It also does not specify which of the listed BMPs must be employed.

[42] As discussed below, this Board is revising the SUSMPs to delete the application of the design standards to retail gasoline outlets and to locations within or directly adjacent to or discharging directly to environmentally-sensitive areas.

R0072475

Potential Impacts on Ground Water

The petitioners contend that infiltration of runoff may lead to ground water pollution, and that the Regional Water Board did not properly consider such potential impacts. The mitigation standards provide for a waiver where there is a risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than ten feet from the soil surface.[43] The Final SUSMPs also include a discussion on how to use infiltration so that the risk of contamination of groundwater is reduced, and where infiltration is not appropriate.[44]

The Regional Water Board did consider the potential impacts to groundwater from infiltration, and included appropriate limitations and guidance on its use as a BMP. These provisions will ensure adequate protection of groundwater from any adverse impacts due to infiltration.

Contention: The petitioners contend the Regional Water Board failed to show that the SUSMPs as adopted are cost-effective and that the benefits to be obtained outweigh the costs.

Finding: The petitioners refer to the Preamble to the Phase II storm water regulations[45] as the basis for their economic argument. The quoted language, however, does not wholly support the petitioners' contention. The Preamble states that President Clinton's Clean Water Initiative clarifies "that the maximum extent practicable standard should be applied in a site-specific, flexible manner, taking into account cost considerations as well as water quality effects."[46] It is clear that cost should be considered in determining MEP; this does not mean that

[43] Final SUSMP, page 14.
[44] *Id.*, at page 15.
[45] 64 Federal Register 68722 and following. These regulations do not apply to the permit, but the general language on MEP is relevant to EPA's interpretation of the standard.
[46] 64 Federal Register 68722, 68732 (December 8, 1999).

the Regional Water Board must demonstrate that the water quality benefits outweigh the economic costs.

While the standard of MEP is not defined in the storm water regulations or the Clean Water Act, the term has been defined in other federal rules. Probably the most comparable law that uses the term is the Superfund legislation, or CERCLA, at section 121(b). The legislative history of CERCLA indicates that the relevant factors, to determine whether MEP is met in choosing solutions and treatment technologies, include technical feasibility, cost, and state and public acceptance.[47] Another example of a definition of MEP is found in a regulation adopted by the Department of Transportation for onshore oil pipelines. MEP is defined as to "the limits of available technology and the practical and technical limits on a pipeline operator . . . ."[48]

These definitions focus mostly on technical feasibility, but cost is also a relevant factor. There must be a serious attempt to comply, and practical solutions may not be lightly rejected. If, from the list of BMPs, a permittee chooses only a few of the least expensive methods, it is likely that MEP has not been met. On the other hand, if a permittee employs all applicable BMPs except those where it can show that they are not technically feasible in the locality, or whose cost would exceed any benefit to be derived, it would have met the standard. MEP requires permittees to choose effective BMPs, and to reject applicable BMPs only where other effective BMPs will serve the same purpose, the BMPs would not be technically feasible, or the cost would be prohibitive. Thus while cost is a factor, the Regional Water Board is not required to perform a cost-benefit analysis.

In reviewing the record, it is apparent that the Regional Water Board did evaluate the cost of the SUSMPs. While the petitioners claim there is no evidence in the record to show the

[47] 132 Cong. Rec. H 9561 (Oct. 8, 1986).
[48] 49 CFR section 194.5.

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SUSMPs are necessary and cost effective, the opposite is true. The record is replete with documentation of costs of pilot mitigation projects, studies from similar programs in other states, and research studies. The Regional Water Board complied with the requirement to consider cost.

The Regional Water Board found that the cost to include BMPs that will meet the mitigation criteria will be one to two percent of the total development cost. This amount appears reasonable, especially in light of the amount of impervious surface already in Los Angeles County and the impacts on impaired water bodies. In considering the cost of compliance, it is also important to consider the costs of impairment. The beach closures in the Los Angeles region, well documented in the evidence, have reached critical proportions. These beach closures clearly have a financial impact on the area, and should be positively affected by the SUSMPs.

We do note that there could be further cost savings for developers if the permittees develop a regional solution for the problem. We recommend that the cities and the County, along with other interested agencies, work to develop regional solutions so that individual dischargers are not forced to create numerous small-scale projects. While the SUSMPs are an appropriate means of requiring mitigation of storm water discharges, we also encourage innovative regional approaches.

Contention: The petitioners have raised contentions regarding details of the SUSMPs, including the amount of time allowed for inclusion of SUSMPs in local ordinances, and their application to both "discretionary" and "non-discretionary" projects. In addition, during the hearing certain ambiguities in the wording of the Final SUSMPs became apparent, including the provisions regarding redevelopment and environmentally-sensitive areas. In this portion of the

Order we address these issues and also the application of the design standards to retail gasoline outlets (RGOs) and the waiver funding requirements.

Finding: The testimony at the hearing in this matter revealed that there are specific provisions of the SUSMPs that create confusion as to the types of development projects subject to the mitigation design standards. The petitioners also contend that application of the standards to specific types of development either is unreasonable or is inconsistent with the terms of the permit. The specific requirements are discussed below.

Retail Gasoline Outlets

Petitioner WSPA contends that RGOs should be excluded from the SUSMPs. Its petition raised the same general contentions as the other petitioners, but at the hearing WSPA presented evidence specific to RGOs. In particular, WSPA raised questions about the propriety of applying the design standards for BMPs to RGOs. In considering this issue, we conclude that construction of RGOs is already heavily regulated and that owners may be limited in their ability to construct infiltration facilities. Moreover, in light of the small size of most RGOs, treatment also may not be feasible, or safe. The mandatory BMPs that are included in the SUSMPs should be adequate to achieve MEP at RGOs.[49] We conclude that RGOs should not be subject to the BMP design standards because they are already heavily regulated and may be limited in their ability to construct infiltration facilities or to perform treatment.

Redevelopment Projects

The SUSMPs were written to apply to new development and to some types of redevelopment in nine categories of projects. The definition of "redevelopment" reflected the intent of the Regional Water Board to define the scope of redevelopment projects subject to the

[49] WSPA also refers to the list of BMPs in a publication of the California Storm Water Quality Task Force. (Best Management Practice Guide – Retail Gasoline Outlets. March 1997.) This publication includes BMPs in addition to those listed in the SUSMPs, which should be considered for inclusion therein.

requirements. That definition[50], however, was somewhat confusing, and it was apparent from testimony at the hearing that the parties had different understandings of the scope of redevelopment subject to the SUSMPs. In their post-hearing briefs, the various parties appeared to agree on the actual intent of the Regional Water Board in including redevelopment in the SUSMPs. This intent was to include redevelopment that adds or creates at least 5,000 square feet of impervious surface to the original development and, where the addition constitutes less than 50 percent of the original development, to limit the application of the BMP design standards to the addition.

While some parties requested further requirements for development, it appears that the Regional Water Board's original intent was relatively simple to apply and results in a fair and appropriate application of the SUSMPs' requirements to redevelopment. Therefore, we will revise the definition in the SUSMPs accordingly.

Environmentally-Sensitive Areas

The permit required that the SUSMPs address at least seven development categories.[51] The final SUSMPs added two more categories: parking lots of 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff; and location within or directly adjacent to an environmentally-sensitive area (ESA). The petitioners contend that the

[50] The SUSMPs state: "Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces.

[51] The categories listed in the permit are: single-family hill residences, 100,000 square-foot commercial developments, automotive repair shops, retail gasoline outlets, restaurants, home subdivisions with 10 to 99 housing units, and home subdivisions with 100 or more housing units. Permit, Part 2, III.A.1.c.

addition of ESAs was inappropriate because the permit refers only to "development categories"[52] and ESA is a location category.

Whether or not the Regional Water Board went beyond the permit's terms in including this category, we find a fundamental problem with the language of the SUSMPs regarding ESAs. All of the other categories are relatively simple to apply because they describe the types of development that fall within the category. For instance, the threshold for a commercial development is 100,000 square feet. If the development is smaller, it is not subject to the SUSMPs. But for developments within ESAs, the SUSMPs contain no threshold. This absence led to speculation by the petitioners that something as small as a new patio on a home in an ESA would make the SUSMPs applicable. The Regional Water Board, at the hearing and in its post-hearing brief, conceded that there should be some threshold. While the Regional Water Board did recommend a specific threshold, we believe that it is inappropriate for this Board to add a threshold that has not been fully discussed by all interested persons.

While it may be appropriate to include more stringent controls for developments in ESAs, we also note that such developments are already subject to extensive regulation under other regulatory programs. Moreover, in light of the permit language limiting the SUSMPs to development categories, ESAs are not an appropriate category within the SUSMPs. The Regional Water Board may choose to consider the issue further when it reissues the permit.

Discretionary and Non-Discretionary, or Ministerial, Projects

The petitioners contend that the SUSMPs should apply only to projects that are considered "discretionary" within the meaning of California Environmental Quality Act

[52] *Id.*

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(CEQA).[53] They argue that the inclusion of non-discretionary, or ministerial, projects is inconsistent with the terms of the permit.

The permit provisions on development projects do refer to "discretionary" projects in several places. The permittees are directed to develop a checklist for determining priority and exempt projects.[54] Priority projects are defined as development and redevelopment projects requiring discretionary approval, which may have a potential significant effect on storm water quality.[55] The permittees are also required to develop a BMP list.[56] In developing the SUSMPs, the permittees are required to incorporate appropriate elements of the BMP list.[57] Next, the permittees must develop a program on planning control measures for priority projects (which are limited to projects requiring discretionary approval), consistent with the list of BMPs and the SUSMPs.[58] The permit further states that, in order to assure compliance with these requirements, the permittees must develop guidelines on preparing CEQA documents that link mitigation conditions to "local discretionary project approvals."[59]

Taken as a whole, the provisions of the permit appear to link the development requirements for SUSMPs to developments that receive discretionary approval by local governments, as defined in CEQA. The SUSMPs are an implementation tool for the permit and must be consistent with the permit. While the limitation of the SUSMPs to discretionary projects may not be sufficiently broad for an effective storm water control program, the Regional Water Board acted inappropriately in expanding the SUSMPs to include non-discretionary projects. The Regional Water Board may consider expanding the development controls beyond CEQA

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[53] Public Resources Code section 21000 *et seq.*
[54] Permit, Part 2, III.A.1.a.
[55] *Id.*
[56] Permit, Part 2, III.A.1.b.
[57] Permit, Part 2, III.A.1.c.
[58] Permit, Part 2, III.a.2.
[59] Permit, Part 2, III.a.3.b.

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discretionary projects when it reissues the permit. But at this time, the SUSMPs must be revised so that they are limited to development projects requiring discretionary approval within the meaning of CEQA.[60]

Waiver Funding Requirement

Where a waiver is granted from the design standard requirements, the Final SUSMPs provide that the permittee must require the project proponent to transfer the cost savings to a storm water mitigation fund. The fund is to be operated by a public agency or a non-profit entity, to promote regional or alternative solutions for storm water pollution in the same storm watershed. The petitioners contend that the funding requirement will create an additional administrative burden.

The concept of a mitigation fund or "bank" is a positive idea for obtaining regional solutions to storm water runoff. As a long-term strategy, municipal storm water dischargers should work to establish regional mitigation facilities, which may be more cost-effective and more technically effective than mitigation structures at individual developments. But at this point there are not sufficient resources in place to require all permittees to establish such funds or to find appropriate non-profit organizations. Before mandating funding, preliminary questions should be answered, including who will manage the fund, what types of projects it will be used for, what entities can legally operate such funds, and how permittees will determine the amount of the assessments. It would be appropriate for the County to consider developing a program with the appropriate flood control agency, or as a model for the separate cities to develop. There may be suitable agencies to administer such funds, but the development of programs may take

[60] We note that the Final SUSMPs already include a definition of "discretionary project" consistent with the definition in the CEQA guidelines. Final SUSMPs at page 4 of 25; Title 14, California Code of Regulations, section 15357. Apparently this definition was inadvertently retained after the Regional Water Board decided to expand the SUSMPs beyond discretionary projects.

some time. The Regional Water Board should consider adopting such a program when it reissues the permit, after consultation with the appropriate local agencies.

III. CONCLUSIONS

Based on the discussion above, the Board concludes that:

1. The Regional Water Board complied with the procedural requirements of the permit, including the Administrative Review Process, in approving the Final SUSMPs.
2. The Regional Water Board was authorized to revise the SUSMPs by including more stringent requirements than the permittees had proposed.
3. The Regional Water Board complied with did not violate the Administrative Procedure Act, CEQA, or the Constitutional provisions on state mandates. The petitioners' due process rights have been protected.
4. The Regional Water Board considered the costs of the SUSMPs, and acted reasonably in requiring these controls in light of the expected benefits to water quality.
5. The Final SUSMPs reflect a reasonable interpretation of development controls that achieve reduction of pollutants in storm water discharges to the maximum extent practicable.
6. The SUSMPs include adequate protections of groundwater quality from any impacts from infiltration.
7. The SUSMPs will be revised to clarify the intent of the Regional Water Board and to make them consistent with the permit. Specifically, retail gasoline outlets should not be subject to the BMP design standards because they are already heavily regulated and may be limited in their ability to construct infiltration facilities or to perform treatment. Redevelopment projects should be subject to the SUSMPs only if they result in creation or addition of 5,000 square feet of impervious surfaces. Environmentally-sensitive areas should not be listed as a category in the SUSMPs. The SUSMPs should only apply to discretionary projects. The requirement for

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funding by project proponents who receive waivers should be deleted. The SUSMPs will be amended as shown in the attachment to this Order.

8. In light of the revisions of the SUSMPs made by this Order, and to allow the permittees adequate time to adopt implementing ordinances, the deadline for adopting ordinances will be revised to January 15, 2001, and the effective date of the Final SUSMPs will be revised to February 15, 2001.

IV. ORDER

IT IS HEREBY ORDERED that the Standard Urban Storm Water Mitigation Plans for Los Angeles County and Cities in Los Angeles County is revised consistent with the amendments attached hereto. In all other respects the petitions are dismissed.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 19, 2000.

AYE:

NO:

ABSENT:

ABSTAIN:

_____

Maureen Marché
Administrative Assistant to the Board

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[These amendments are to the Final SUSMP, as published March 8, 2000]

Page 3 of 25

First full paragraph:

All **discretionary development and redevelopment** projects that fall into one of ~~seven~~ **the following** categories are ~~identified in the Los Angeles County MS4 Permit as requiring~~ **subject to these** SUSMPs. These categories are:

- Single-family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units
- **Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff**

Second full paragraph:

~~The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements for the Los Angeles County MS4 Permit. These categories are:~~

- ~~Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and~~
- ~~Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff~~

Fourth full paragraph:

Permittees shall amend codes not later than ~~September 8, 2000~~ **January 15, 2001**, to give legal effect to the SUSMP requirements. The SUSMP requirements for projects identified herein shall take effect not later than ~~October 8, 2000~~ **February 15, 2001**.

Page 4 of 25

Delete definition of "Environmentally Sensitive Area"

Revise Definition of "Redevelopment":

"Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces ~~or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure~~. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of a routing maintenance activity; and land disturbing activities related with structural or impervious surfaces. **Where redevelopment results in an increase of less than fifty percent of the impervious surfaces of a previously existing development, and the existing development was not subject to these SUSMPs, the Design Standards apply only to the addition, and not to the entire development.**

Page 10 of 25

Add to "Limited Exclusion": Retail Gasoline Outlets

Page 15 of 25

Delete the first full paragraph (storm water mitigation funding)

STATE WATER RESOURCES CONTROL BOARD WORKSHOP & BOARD MEETING AGENDA

Wednesday, October 4, 2000 – 11:30 a.m.
Thursday, October 5, 2000 -- 9:00 a.m.

First-Floor Hearing Room
Paul R. Bonderson Building
901 P Street, Sacramento

Questions regarding this agenda call Maureen Marché (916) 657-0990 or fax 657-0932. This notice and associated staff reports can be accessed electronically through our Internet address: http://www.swrcb.ca.gov. (Note: agenda items should be available electronically on September 27, 2000.)

Workshop includes informal discussion of items to be presented for action at a future business meeting. People who are interested in items on the agenda are urged to attend workshops as they may miss valuable discussion that will not be repeated at the Board meeting. NOTE: There is no voting at workshops. Items requiring Board action must come to a Board meeting.

Please note time limitations on presentations may be imposed.
The State Board requests that oral testimony be summarized.
Submittal of written comments is encouraged to ensure
that all comments will be included in the
record before the Board.*

ITEM 1 WILL BE DISCUSSED STARTING AT 11:30 A.M., WEDNESDAY, OCTOBER 4, 2000.
ITEMS 2-14 WILL BE DISCUSSED STARTING AT 1:00 P.M., WEDNESDAY, OCTOBER 4, 2000

Workshop

PUBLIC FORUM
Any member of the public may address and ask questions of the Board relating to any matter within the Board's jurisdiction, provided the matter is not on the Board's agenda or pending before the Board or a Regional Board. *Note: Presentations at the Public Forum will be limited to 5 minutes or otherwise at the discretion of the Chairman.*

WATER QUALITY
1. Presentation of the Assembly Bill 982 Public Advisory Group's Ambient Surface Water Monitoring Report. (Information Item – Assembly Bill 982 Public Advisory Group will present its Ambient Surface Water Monitoring Report to the Board.)

2. Status Report of Current Priorities by Tri-TAC. (Information item.)

CLEAN WATER PROGRAMS PETITION Removed

3. In the Matter of the Petition of G.W. Singletary for Review of a Determination of the Division of Clean Water Programs, State Water Resources Control Board, Finding Petitioner Ineligible to Participate in the Underground Storage Tank Cleanup Fund. SWRCB/OCC File UST-145. (The Board will consider, at a Board Meeting, whether to adopt the proposed order upholding the Division's decision.)

OCEAN PLAN
4. Consideration of a Resolution Approving Proposed Amendments to the California Ocean Plan (Ocean Plan). (The Board will consider, at a Board meeting whether to adopt the proposed amendments to the Ocean Plan.) As previously noticed, comments on the Draft Functional Equivalent Document dated September 1, 2000 are requested to be received by 5:00 p.m., September 28, 2000. Comments should be sent to Frank Palmer, SWRCB, Division of Water Quality, P. O. Box 944213, Sacramento, CA 94244-2130. Electronic comments can be sent to Chris Beegan at **beegc@dwq.swrcb.ca.gov**.

-over-

CLEAN WATER PROGRAMS

****5. Consideration of a Request from the San Diego Regional Water Quality Control Board for $600,000 From the State Water Pollution Cleanup and Abatement Account to Fund a Contract to Eradicate an Infestation of an Invasive Marine Alga.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution approving the funding commitment for the project.)

****6. Consideration of a Request From the Santa Ana Regional Water Quality Control Board for $200,000 from the State Water Pollution Cleanup and Abatement Account to Fund a Contract to Study Causes of Microbial Contamination at Huntington Beach.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution approving this request.)

****7. Consideration of Approval of a Small Community Grant (SCG) for the Sewage Treatment Plant Improvements Project, Tomales Village Community Services District, SCG Project No. SCG – 638.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution approving the request.)

****8. Consideration of Approval of a Small Community Grant (SCG) for the Wastewater Treatment Facility Upgrade Project, City of Angels, SCG Project No. SCG – 602.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution approving the grant.)

****9. Consideration of Approval of a Small Community Grant (SCG) for the Wastewater Treatment Facility Upgrade Project, City of Calistoga, SCG Project No. SCG – 609.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution approving the grant.)

****10. Consideration of Approval of a Small Community Grant (SCG) for the Northwest Regional Infiltration/Inflow Reduction Measures Project, Lake County Sanitation District, SCG Project SCG – 678.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution approving the grant.)

****11. Consideration of Approval of a Small Community Grant (SCG) for the Hilmar Wastewater Treatment Facility Improvement Project, Hilmar County Water District, SCG Project SCG – 711.** (The Board will consider, at a Board meeting, whether to adopt the grant.)

****12. Consideration of Approval of a Small Community Grant (SCG) for the Westmorland Wastewater Treatment Plant Project, City of Westmorland, SCG Project SCG – 613.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution approving the grant.)

WATER QUALITY

****13. Consideration Of Approval of a Resolution Authorizing the Executive Director to Execute Contracts With the Lake Elsinore And San Jacinto Watersheds Authority for Specified Activities Authorized Under the Costa-Machado Water Act Of 2000.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution.)

****14. Consideration of a Proposed Resolution Authorizing the Executive Director to Negotiate, Execute, and Amend, as Necessary, an Interagency Agreement With the University of California, Davis for a Surface Water Quality Monitoring and Assessment Project and Report.** (The Board will consider, at a Board meeting, whether to adopt the proposed resolution.)

Closed Session Items
(Please note Closed Sessions are not open to the public.)

WATER QUALITY PETITION – The Board will be meeting in closed session to deliberate on a decision to be reached following a formal hearing it conducted in the Matter of the Petitions of Tosco Corporation, et al. (Avon Refinery Waste Discharge Requirements Order No. 00-011, as amended by Order No. 00-056 [NPDES CA0004961] and Rodeo Refinery Waste Discharge Requirements Order No. 00-015 [NPDES CA0005053], San Francisco Bay Region. SWRCB Files A-1283, A-1283(a)-(e), A-1289, A-1289(a)-(c). (This closed session is authorized by Government Code section 11126, subdivision (c)(3).)

WATER RIGHTS – The Board will be meeting in closed session to deliberate on a proposed decision to be reached regarding the protection of fishery resources and other issues relating to the diversion and use of water from the lower Yuba River. This is authorized under Government Code section 11126(c)(3).

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ITEM 15 WILL BE DISCUSSED STARTING AT 9:00 A.M., THURSDAY, OCTOBER 5, 2000.
ITEM 16 WILL NOT BE DISCUSSED EARLIER THAN 10:00 a.m., THURSDAY, OCTOBER 5, 2000

Workshop

PUBLIC FORUM
Any member of the public may address and ask questions of the Board relating to any matter within the Board's jurisdiction, provided the matter is not on the Board's agenda or pending before the Board or a Regional Board. *Note: Presentations at the Public Forum will be limited to 5 minutes or otherwise at the discretion of the Chairman.*

15. Status Report of Current Activities by CalFed. (Information item.)

Board Meeting

WATER QUALITY PETITION (Note: Item 16 will not be discussed earlier than 10:00 a.m.)
16. In the Matter of the Petitions of the Cities of Bellflower, et al., City of Arcadia, and Western States Petroleum Association (Review of January 26, 2000 Action of the Regional Board, and Actions and Failures to Act by Both the Regional Board and its Executive Officer Pursuant to Order No. 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges With Los Angeles County [NPDES No. CAS614001]), Los Angeles Region. SWRCB Files A-1280, A-1280(a), and A-1280(b). (The Board will consider whether to adopt the proposed order approving the Standard Urban Storm Water Mitigation Plans, with revisions to the types of development subject to the mitigation requirements.)
Note: As previously noticed, the deadline for written comments is September 28, 2000.

*In order to be fully considered at the meeting, all written comments on items 1-3 and 5-15 must be received by 5:00 p.m., September 29, 2000. Mailing address: PO Box 100, Sacramento, CA 95812-0100; FAX 916-657-0932.

**These items are expected to be routine and noncontroversial and there will be no discussion unless requested by a Board Member, staff or interested party. If such a request is made, the item will be considered separately.

Note: On October 2-3, 2000 the Board will be taking a tour of the Mono Lake area.

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STATE WATER RESOURCES CONTROL BOARD
BOARD MEETING – OFFICE OF CHIEF COUNSEL
October 5, 2000
Item No. 16

ERRATA SHEET
REGARDING DRAFT ORDER FOR CITIES OF BELLFLOWER ET AL.
(FILES A-1280, A-1280(a) AND A-1280(b)

At page 21, at end of second full paragraph, add new footnote:

We note that the SUSMPs as written do not in any way preclude the use of regional solutions as a means to comply with the BMP and design standard requirements.

At pages 22-23, revise paragraph on Retail Gasoline Outlets as follows:

Retail Gasoline Outlets

Petitioner WSPA contends that RGOs should be excluded from the SUSMPs. Its petition raised the same general contentions as the other petitioners, but at the hearing WSPA presented evidence specific to RGOs. In particular, WSPA raised questions about the propriety of applying the design standards for BMPs to RGOs. In considering this issue, we conclude that construction of RGOs is already heavily regulated and that owners may be limited in their ability to construct infiltration facilities. Moreover, in light of the small size of ~~most~~ many RGOs and the proximity to underground tanks, treatment also may not be feasible, or safe. The mandatory BMPs that are included in the SUSMPs ~~should~~ may be adequate to achieve MEP at RGOs, but the Regional Water Board should consider adding additional mandatory BMPs, such as use of dry cleanup methods (e.g. sweeping) for removal of litter and debris, use of rags and absorbents for leaks and spills, restricting the practice of washing down hard surfaces unless the wash water is collected and disposed of properly, annual training of employees on proper spill cleanup and waste disposal methods, and the inclusion of BMPs to address trash receptacle areas and air/water supply areas.[1] We conclude that because RGOs ~~should not be subject to the BMP design standards because they~~ are already heavily regulated and may be limited in their ability to construct infiltration facilities or to perform treatment, they should not be subject to the BMP design standards at this time, and recommend that the Regional Water Board undertake further consideration of a threshold relative to size of the RGO, number of fueling nozzles, or some other relevant factor.

[1] ~~WSPA also refers to the~~These BMPs are from a list of BMPs in a publication of the California Storm Water Quality Task Force. (Best Management Practice Guide – Retail Gasoline Outlets. March 1997.) This publication includes BMPs in addition to those listed in the SUSMPs~~, which should be considered for inclusion therein~~.

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640
Internet Address: http://www.swrcb.ca.gov/~rwqcb4

Gray Davis
Governor

March 8, 2000

Harry Stone
Director of Public Works,
County of Los Angeles, Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91802-1460

Ray Holland
Director of Public Works, City of Long Beach
333 West Ocean Boulevard
Long Beach, CA 90802

STANDARD URBAN STORM WATER MITIGATION PLANS AND BOARD RESOLUTION APPROVING POST-CONSTRUCTION BMP REQUIREMENTS FOR DEVELOPMENT PLANNING AND CONSTRUCTION (Board Resolution No. R-00-02)

Dear Mr. Stone and Mr. Holland:

On January 26, 2000, the Regional Board at its hearing adopted Board Resolution No. R-00-02 directing me to approve the Standard Urban Storm Water Mitigation Plan (SUSMP) with changes noted. The Regional Board at the same time also adopted the SUSMP requirements for the City of Long Beach under the City of Long Beach municipal separate storm sewer system (MS4) permit (Board Order No. 99-060).

Copies of the Regional Board Executive Officer approved SUSMP, Board Directed Changes - Supplement, and the Resolution adopted by the Regional Board are attached.

The City of Long Beach and all Los Angeles County Municipal Storm Water Permittees will have until September 8, 2000, to promulgate ordinances or amend municipal codes to implement the SUSMP requirements. The SUSMP requirements shall take effect no later than October 8, 2000. All parties, including the City of Long Beach, will have 30 days from the date of this letter to file a review of the action by the State Water Resources Control Board.

If you have any questions, please call me at (213) 576-6605 or Dr. Swamikannu at (213) 576-6654.

Sincerely,

Dennis A. Dickerson
Executive Officer

Cc: Permittees
Interested Parties

R0072492

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION

Resolution No. R-00-02

APPROVING THE
STANDARD URBAN STORM WATER MITIGATION PLAN
FOR
MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS
IN LOS ANGELES COUNTY

WHEREAS, THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FINDS:

1. On July 15, 1996, a municipal separate storm sewer system permit (Los Angeles County MS4 Permit) was issued to the County of Los Angeles and 85 incorporated cities to control and minimize the discharge of pollutants associated with storm water and urban runoff. This permit became Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles.

2. On June 30, 1999, a municipal storm water permit was issued to the City of Long Beach (City of Long Beach MS4 Permit) which removed the City of Long Beach from Board Order No. 96-054, giving the City of Long Beach its own distinct Municipal Storm Water and Urban Runoff NPDES permit, Regional Board Order No. 99-060, "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the City of Long Beach".

3. On August 19, 1999, a statewide general storm water permit for construction activity (Statewide Construction Storm Water Permit) was adopted by the State Water Resources Control Board (State Board). This permit became State Board Order No. 99-08-DWQ, and applies to construction projects that disturbs five acres or more or is part of a larger common plan of sale in the Los Angeles region.

4. Many of the rivers and streams in Los Angeles County are formally designated as impaired, pursuant to Section 303 (d) of the federal Water Pollution Control Act, for specific pollutants that are commonly found in storm water and urban runoff.

5. Storm water runoff carries with it many pollutants in varying concentrations that are suspended in, and or dissolved, in the runoff. The sources of these pollutants include nearly all properties that have been developed since the pollutants originate through the many diverse activities of habitation and land use. Pollutants generated from individual property developments vary greatly in the concentration or loading of each pollutant. Generally, the relative contribution of the pollutant from runoff from any individual property development will represent only a small portion of the entire loading of a water body given the many square miles of land upon which storm water runoff is generated. When the individual contributions from tens of thousands of discrete property units are aggregated, the pollutant loading becomes significant. The resultant pollutant loads results in the impairment of that water body and the conveyance of pollutants, including sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides to the ocean and harbors within Los Angeles County. The loading of pollutants generated in the Los Angeles area are being measured through the monitoring program being conducted by the Los Angeles County Department of Public Works in conformance with its obligations as the Principal Permittee under the Los Angeles CountyMS4 Permit.

R0072493

6. The nature of property use is related to the types and quantities of pollutants that are transported from that property during a rainfall event.

7. As property is developed or redeveloped, the utilization of Best Management Practices provide an opportunity to reduce the loading of pollutants to water bodies. This is accomplished by various techniques and can be passive (source reduction) or active (treatment). As property is developed from undisturbed lands, the project can be designed to incorporate Structural or Treatment Control (Best Management Practices (BMPs) that would normally not be available or practical to use on property that has been in urban use.

8. BMPs are effective means of reducing pollutants and Structural or Treatment Control BMPs can be "designed-into" a project in a cost effective way and in a manner that is either transparent to or which enhances the use to which the property has been placed. Some BMPs encourage the setting aside of areas as a greenbelt to allow storm water runoff to flow over areas which are permeable, thereby allowing all or a portion of the runoff to infiltrate. Other BMPs can be designed and built into structures such as catch basins that incorporate replaceable filters to absorb oily wastes or by installing screens to prevent litter from passing through the system and into the water body.

9. Arrays of Structural or Treatment control BMPs are available to developers of both new and redevelopment properties. The use of BMPs is already required by the terms of the Los Angeles County and Long Beach Municipal Storm Water and Urban Runoff NPDES permits.

10. The ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time. A BMP that can only be effective for a small volume of storm water runoff is inherently less effective than one sized to accommodate a larger volume of water.

11. Storm water runoff will normally convey a disproportionate loading of pollutants in the initial period runoff is generated during a storm event. Storm events generating up to 0.75 inches of precipitation, measured over a 24-hour period, constitute 85 percent of the total amount of runoff that can be expected during an average wet season. Designing a BMP to be able to accommodate this amount of runoff will result in the application of a BMP intervention to all but 15% of the total runoff during a year, and usually all of the critical runoff that occurs in the early phase of the precipitation event, commonly referred to as the "first Flush."

12. Both the Los Angeles County MS4 Permit (Part III.A.1.c) and the City of Long Beach MS4 Permits contain provisions related to the adoption of Standard Urban Storm Water Mitigation Plans (SUSMPs) requiring their development and implementation.

13. Standard Urban Storm Water Mitigation Plans are required for a specified set of enumerated projects and the permit specifically identifies seven distinct categories for which SUSMPs are required to be prepared. The permit specifically states that the seven categories of projects are the minimum categories requiring SUSMPs.

14. Standard Urban Storm Water Mitigation Plans are also required for development or redevelopment of Parking Lots 5,000 square feet or greater and Locations in Environmentally Sensitive Areas. These categories have been added to advance efforts to control storm water pollution beyond the minimum in Los Angeles County.

15. Standard Urban Storm Water Mitigation Plans are required to be approved by the Regional Board Executive Officer following which they are to be implemented by the Permittees and used by the Permittees as the minimum criteria for the approval of project specific Urban Storm Water Mitigation Plans and the issuance of grading or building permits to project applicants.

16. The Statewide Construction Storm Water Permit requires that Storm Water Pollution Prevention Plans (State SWPPPs) contain post-construction BMPs that will be implemented after construction is complete.

17. Section 402 (p) of the Clean Water Act requires the Administrator of the United States Environmental Protection Agency or her designated agent, in this instance, the Regional Board, to require as part of the storm water program "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [USC Section 1342 (p)(3)(B)].

18. A recent decision of the United States 9th Circuit Court of Appeals, *Defenders of Wildlife v. Browner* (1999) Case No. 98-71080, provides additional support and clarification of the authority of the Administrator and the Regional Board to impose additional controls on storm water pollution. The Court in *Defenders of Wildlife v. Browner* said that the USEPA and the States have discretion under the law to determine what pollution controls are appropriate to achieve compliance.

19. Pursuant to the requirements of Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, the Regional Board Executive Officer received a proposal for Standard Urban Storm Water Mitigation Plans submitted by the Principal Permittee.

20. Upon the review of the Regional Board Executive Officer, the Standard Urban Storm Water Mitigation Plan submitted for the seven applicable categories was deemed inadequate. A revised SUSMP proposal was developed subsequent to a discussion of the proposal's conceptual foundation at a public workshop held on August 10, 1999. This workshop was well attended with over 80 municipal representatives and interested parties participating.

21. On August 16, 1999, a public notice was issued indicating that the Standard Urban Storm Water Mitigation Plans proposed by the Principal Permittee would be augmented by the addition of criteria related to specifying numerical design criteria for BMP construction. The matter was noticed for the Regional Board's September meeting to allow the issue to be discussed before the Board although no formal action of the Regional Board itself is required for SUSMP approval.

22. On September 16, 1999, the Regional Board conducted a public hearing on the Standard Urban Storm Water Mitigation Plan proposal as amended by the Executive Officer. At that hearing, the Regional Board Executive Officer suggested additional time would be necessary to develop a more comprehensive proposal incorporating the comments received at the public hearing.

23. Between September 16, 1999 and January 25, 2000, the Regional Board Executive Officer met with interested parties to discuss comments and concerns from interested parties.

24. The Southern California Council of Governments (SCAG) has indicated its interest in obtaining funding to prepare a regional plan(s) to address storm water pollution and identify regional treatment solutions for implementation.

25. On December 7, 1999, the Regional Board Executive Officer released a revised Standard Urban Storm Water Mitigation Plan document to interested parties.

THEREFORE BE IT RESOLVED THAT:

1. The Regional Board endorses the Standard Urban Storm Water Mitigation Plan prepared by the Regional Board Executive Officer and noticed to the public on December 7, 1999 and the concepts therein relating to numerical storm water mitigation standards for Best Management Practices; and

2. The Regional Board directs the Regional Board Executive Officer to approve the Standard Urban Storm Water Mitigation Plan at the earliest opportunity incorporating changes made and formally approved by the Regional Board at the January 26, 1999 Board Hearing;

3. The Regional Board adopts the approved requirements as provisions applicable to the SUSMP requirements for the City of Long Beach.

4. The Regional Board adopts the numerical mitigation standards for storm water, endorsed herein, as the minimum design criteria for review of post-construction BMPs in the Los Angeles Region for construction projects subject to coverage under the Statewide Construction Storm Water Permit.

5. The Regional Board encourages the Permittees and all interested parties to work together in a spirit of cooperation to effect the implementation of the Standard Urban Storm Water Mitigation Plan at the earliest possible date, and

6. The Regional Board encourages the efforts by the Southern California Council of Governments and area Council of Governments (COGs) to develop regional plans and identify regional solutions to address storm water pollution from new development and redevelopment.

I, Dennis Dickerson, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 26, 2000.

DENNIS A. DICKERSON
Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

STAFF REPORT AND RECORD OF DECISION

STANDARD URBAN STORM WATER MITIGATION PLANS

AND

NUMERICAL DESIGN STANDARDS FOR BEST MANAGEMENT PRACTICES

SUPPLEMENT

BOARD DIRECTED CHANGES

The Regional Board at its January 26, 2000, meeting directed the Regional Board Executive Officer to amend the Standard Urban Storm Water Mitigation Plans (SUSMPs) as indicated by the change sheet presented at the meeting (dated January 25, 2000), and changes directed by the Regional Board during the meeting. The Regional Board also adopted the same SUSMP requirements for the City of Long Beach under its separate municipal storm water permit (Board Order No. 99-060) for project categories that require SUSMPs.

Regional Board Counsel designated the record for the proceeding to include: (i) all staff files and the transcript of proceedings for the January 26, 2000, Hearing; (ii) all staff files and transcript of proceedings for the September 16, 1999, Board Information Item Discussion; (iii) all staff files for the August 10, 1999, Workshop, (iv) all SUSMP Proposals circulated by the Permittees, (v) all SUSMP Proposals circulated by the Regional Board Staff, (vi) all comments received and responses; (vii) and all exhibits presented to the Board.

This "Supplement" document enumerates the significant changes made to the SUSMP that were directed by the Board at the hearing and the bases for the changes in the "Transcript of Proceedings", testimony presented or materials submitted to the Regional Board, and other relevant documents.

Applicability of the SUSMP

The SUSMP requirements apply to all projects in the nine enumerated categories for the Los Angeles County MS4 Program. While some development planning/ construction requirements in the permit are made applicable only to "Discretionary Projects", this limitation does not cover the seven "enumerated project categories" in Board Order No.

96-054, and the two additionally designated "enumerated project categories" by the Regional Board Executive Officer and affirmed by the Regional Board.[1]

Applicability to Categories for the City of Long Beach

A statement has been added to clarify that SUSMP requirements adopted by the Regional Board apply to the City of Long Beach MS4 Program for only: (i) 10-99 home subdivisions; (ii) 100 or more subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Plan.[2]

Effective Date for SUSMP Requirements

A statement has been included to provide Permittees 6 months from the date of Regional Board Executive Officer's approval of the SUSMP to amend ordinances and codes to be consistent with the adopted SUSMP requirements, and thence 30 days thereafter for the requirements to take effect.[3]

Definition of Commercial Development

The definition of "Commercial Development" has been reworded to be inclusive of all developments that are not considered "Residential" or "Heavy Industrial" based on the categorization of the federal storm water regulations.[4]

Definition of Environmentally Sensitive Areas

A new "Table 3" has been added to the SUSMP to list areas presently covered under the definition of "environmentally sensitive areas" based on readily ascertainable designations by the State Water Resources Control Board, the California Resources Agency, and the County of Los Angeles.[5]

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[1] Transcript of Proceedings, January 26, 2000 (CSR No. 10992 and 11568) at 228. Discussion by Regional Board Counsel Leon and direction by Board Member Cloke.

[2] Ibid. at 289. Clarification by Dr. Swamikannu and request by Board Member Cloke to include clear text to explain its applicability to the City of Long Beach.

[3] Ibid at 76 and 300. Recommendation by Mr. Dickerson responding to a question by Regional Board Chairman Nahai and affirmation by Board.

[4] Ibid at 66 and 285. Discussion by Board Members on the scope of the definition and response by Dr. Xavier Swamikannu.

[5] Ibid. at 206, 280, and 305. Discussion with Chairman Nahai and Dr. Coe of the ready ascertainibility of the designated sites, and agreement to provide a listing in the SUSMP.

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Definition of Parking Lots

The definition of "Parking Lots " has been reworded to eliminate the "stand alone" limitation, so that it now applies to all parking lots with 5,000 square feet or more or with 25 parking spaces or more and exposed to storm water.[6]

Definition of Redevelopment

The definition of "Redevelopment" has been reworded to include a minimum threshold of at least 5,000 square feet of impervious area addition to an existing property in order for the SUSMP requirements to apply. The threshold value is consistent with other threshold values in the SUSMP, such as Parking Lots and Restaurants.[7]

Definition of Restaurant

The definition of "Restaurant" has been reworded to limit applicability to "stand-alone" facilities and exclude co-located stalls or food counters in general purpose establishments such as markets and grocery stores.[8]

Definition of Retail Gasoline Outlet

The definition of "Retail Gasoline Outlet" has been reworded to include all retail gasoline outlets that sell gasoline and lubricating oils without consideration of the proportion of receipts derived from such sales.[9]

Conflict with Local Practices

The paragraph has been reworded to allow local ordinances to differ from the SUSMP so long as they are more stringent.[10]

Responsibility and Conditions for BMP Transfer

The language has been modified to ensure that the responsibility for the maintenance of Structural or Treatment Control BMPs is properly transferred with the sale of a property and is mandatory.[11]

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[6] Ibid. at 301 and 306. Board Members Cloke and Diamond discuss and direct staff to eliminate the "stand-alone" limitation.

[7] Ibid. at 67 and 302. Board Chairman Nahai discusses the absence of a minimum threshold and directs staff to set a minimum value to address his concerns of proportionality aberrations.

[8] Ibid. at 68. Board Chairman interprets applicability and Dr. Swamikannu confirms the interpretation.

[9] Ibid. at 46, 49, 308. Board Members discuss the staff proposed definition based on primary activity and direct staff to extend the definition to include all gas stations that pump gas.

[10] Ibid. at 308. Board Members discuss the language and provide specific language for the purpose of local program consistency and to ensure adherence to the SUSMP requirements.

Roofing Surface Area Exclusion from Mitigation Standard

The roofing surface credit for calculation of storm water runoff volume for mitigation has been eliminated.[12]

Limited Exclusion for Small Restaurants from Mitigation Standard

The sentence has been clarified to state to exempt restaurants less than 5,000 square feet from the requirement to mitigate storm water only. All other requirements for restaurants apply.[13]

Waiver Provision

The paragraph has been modified to recognize proximity to an unconfined water table as one basis for the granting of a waiver.[14]

A sentence has been added to require that all other BMPs be considered and rejected before a waiver from the numerical mitigation standard is granted.[15]

A statement has been added to require that non-enumerated bases for waiver be brought to the Regional Board for consideration. The Regional Board can delegate the approval authority for a class of waivers to the Regional Board Executive Officer.[16]

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[11] Ibid. at 63 and 313 Board Members discuss the significance of ensuring proper transfer of BMP maintenance responsibility and provide firm enabling language.

[12] Ibid. at 48 and 314. Board Members discuss the elimination of the rooftop exemption with the possibility of reconsideration in the future if Permittees affirmatively demonstrate that rooftop runoff is not a source of pollutants.

[13] Ibid. at 322. Board Members discuss the limited exclusion and agree with Dr. Swamikannu's rationale for the exclusion threshold from numerical design standards.

[14] Ibid. at. 60 Board Member Coe suggests the change to address the issue and Dr. Swamikannu accepts the suggestion.

[15] Ibid. 74 and 326 Board Members discuss the Waiver provision and provide language to ensure that all options for mitigation are considered.

[16] Ibid. at 75 and 328. Board Chairman Nahai provides direction to staff to require any new waiver bases to be brought to the Regional Board to ensure public discussion and consideration.

STANDARD URBAN STORM WATER MITIGATION PLAN

DEVELOPMENT PLANNING

CHANGE SHEET (Revised)

Summary

The Change Sheet lists proposed changes to the Final Tentative - Standard Urban Storm Water Mitigation Plan, (December 7, 1999). In general, the proposed changes respond to commenters' suggestions on improving clarity, format, and implementability of the Standard Urban Storm Water Mitigation Plan.

Noteworthy changes include, the addition of a definition for 'storm event' and the requirement of professional registration for certifying persons under the "Alternative Certification' option. Two new references have been added to augment implementation guidance. These are, (i) National Stormwater Best Management Practices (BMP) Database, Version 1.0, and (ii) Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices.*

In the Change Sheet, cross-reference to pages and paragraphs are for the 'Clean Version' dated December 7, 2000. New text added to a sentence is indicated by underline.

Background

1. Page 2 paragraph three, Clarify that a City has to adopt same requirements for the Citywide SUSMP

   Sentence changed to read, "The Permittees are required to adopt the requirements set herein in their own SUSMP."

2. Page 2 paragraph 3, Delete reference to Urban Storm Water Mitigation to avoid confusion

   Sentence changed to read, "Each Permittee will approve the project plan as part of the development plan approval process....

3. Page 3 paragraph 2, Clarify the environmentally sensitive area category.

   Sentence changed to read, "Location within or directly adjacent to or discharging directly to an environmentally sensitive area.

4. Page 3 paragraph 2, Make requirement applicable to stand-alone parking lots only

   Sentence changed to read, "Commercial stand-alone parking lots 5,000 square feet or more.....

Definitions

5. Order definitions alphabetically

   Definitions reordered alpha-numerically

6. Page 3, Modify definition of hillsides to add specificity.

   Definition changed to read, "property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater."

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7. Page 3, Delete exceptions in the definition of Automotive Repair Shop

   Exceptions deleted, now reads, "Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539."

8. Page 3, Modify definition of 100,000 square foot commercial development for simplicity.

   Definition changed to read, "any commercial development that creates at least 100,000 square feet of impermeable area, including parking areas".

9. Page 4 , Add references for definition of environmentally sensitive areas

   References added for Areas of Special Biological Significance and Area of Ecological Significance.

10. Page 4, , Change definition to include a threshold trigger for requirements to apply to Redevelopment

    Definition changed to read, "Redevelopment" means, on an already developed site, the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes.....

11. Page 5, , Change definition for Retail gasoline outlets to clarify 'primarily engaged'.

    Definition changed to read, ""Retail Gasoline Outlet" means a facility engaged in selling gasoline and lubricating oils, which derives more than fifty percent of its annual gross receipts from the sale of gasoline, lubricating oils tires, batteries, automobile parts and other automotive services.

12. New Definition, Define a storm event

    Defined storm event to mean, "a rainfall event that produces more than 0.1 inch of precipitation and that, which is separated from the previous storm event by at least 72 hours of dry weather."

SUSMP Provisions Applicable to All Categories

13. Page 5, paragraph 3, Change sentence for clarity

    Sentence changed to read, "....shall not exceed the estimated pre-development rate for developments where it is reasonably foreseeable that the increased peak storm water discharge rate will result in increased potential for downstream erosion."

14. Page 5, paragraph 4, Delete text that makes act dependent on effort

Sentence changed to read, "Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition."

15. Page 6, paragraph 1, Change sentence for clarity

    Sentence changed to read, "...or the detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and/or flora and fauna."

16. Page 6, paragraph 2, Add reference

    Added reference, "Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices*"

17. Page 6, paragraph 3, Add text to enable BMP combination alternative

    Added text to read, "However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants".

18. Page 6, paragraph 4, Delete text that is tentative

    Text deleted to read, "Project plans must include BMPs consistent....."

19. Page 6, paragraph 4, Add text to promote use of natural drainage systems

    Add text to read, "Utilize natural drainage systems to the maximum extent practicable"

19. Page 6, paragraph 4, Add text to minimize flow to natural drainage systems

    Text added to read, "Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable"

20. Page 7, paragraph 2, Change sentence for clarity

    Sentence changed to read, "Materials with the potential to contaminate storm water must be: (1) placed in an enclosure..."

21. Page 7, paragraph 3, Add text to exclude single family residences

    Sentence added to read, " Individual single family residences are exempt from these requirements"

22. Page 8, paragraph 1, Change text for clarity

    Text changed to read, "The transfer of property to a private or public owner must have conditions..."

23. Page 8, paragraph 1, Add text to require maintenance inspection and record.

    Sentence added to read, "The condition of transfer may include a provision that the property owner conduct maintenance inspection of all treatment control BMPs at least once a year and retain proof of inspection."

24. Page 8, paragraph 3, Delete text for clarity

    Text deleted, "~~each runoff event up to and including~~", Now reads, "the 85th percentile 24-hour runoff event...."

25. Page 8, paragraph 3, Correct based on revised chart treatment volume from 85 percent to 80 percent.

    Text changed to read, "to achieve 80 percent or more volume treatment....."

26. Page 8, paragraph 3, Change text for clarity

    Sentence changed to read, "....runoff produced from a 0.75 inch storm event, prior..."

27. Page 8, paragraph 3, Change text for clarity

    Sentence changed to read, "....volume of runoff produced from a historical-record based reference 24-hour rainfall criterion...."

28. Page 9, paragraph 2, Change text to offer partial credit for roofing surfaces diversion

    Sentence changed to read, "A proportional area of roofing surface may be excluded..."

29. Page 9, paragraph 2, Change text for clarity.

    Sentence changed to read, "storm water conveyance system does not directly discharge to a natural stream or channel segment scheduled for restoration".

30. Page 9, paragraph 3, Change text to clarify exemption from numerical standard only.

    Sentence changed to read, "Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical BMP design standard requirement.

Provisions Applicable to Individual Priority Projects

31. Page 10, paragraph 2, and Page 12, paragraph 1, Change text to eliminate mandatory cover.

    Sentence change to read, "...area must be self-contained and/or covered, equipped with a clarifier,..."

32. Page 12, paragraph 3, Change text for clarity.

    Text modified to read, "....hydrocarbons that are deposited on parking lot surfaces by motor vehicles"

33. Page 12, paragraph 3, Add introductory text.

    Sentence added to read, "To minimize the offsite transport of pollutants, the following design criteria are required".

Waiver

34. Page 13, paragraph 1, Add text for clarity

    Text added to read, "....because an existing or potential underground source of drinking water..."

35. Page 13, paragraph 1, Change text to clarify that Permittee is petitioner.

    Sentence modified to read, "Any other justification for impracticability must be separately petitioned by the Permittee and approved...."

Alternative Certification

36. Page 13, paragraph 1, Change sentences to require professional registration and recommend training verification.

    Sentences added to read "...accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria." And, "The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date."

Suggested Resources

37. Page 15, Add reference BMP database and on-line Texas Non-point Source Book

    Reference added, "National Stormwater Best Management Practices (BMP) Database, Version 1.0" ; and "Texas Non-Point Source Book".

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

Final
Approved – Regional Board Executive Officer
March 8, 2000.

R0072505

LOS ANGELES COUNTY URBAN RUNOFF AND STORM WATER NPDES PERMIT

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Los Angeles County Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit (City of Long Beach MS4 Permit), which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

1. Effectively prohibit non-storm water discharges, and
2. Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable (MEP statutory standard).

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. The Permittees are required to adopt the requirements set herein in their own SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve the project plan as part of the development plan approval process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

All projects that fall into one of seven categories are identified in the Los Angeles County MS4 Permit as requiring SUSMPs. These categories are:

- Single-Family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements for the Los Angeles County MS4 Permit. These categories are:

- Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and
- Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

The City of Long Beach permit requires SUSMP for the following categories only: (i) 10-99 home subdivisions; (ii) 100 or more subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) Projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Plan.

Permittees shall amend codes and promulgate ordinances not later than September 8, 2000, to give legal effect to the SUSMP requirements. The SUSMP requirements for projects identified herein shall take effect not later than October 8, 2000.

DEFINITIONS

"100,000 Square Foot Commercial Development" means any commercial development that creates at least 100,000 square feet of impermeable area, including parking areas."Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Commercial Development" means any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

"Directly Connected Impervious Area (DCIA)" means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g. lawns).

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

"Environmentally Sensitive Area" means an area designated as an Area of Special Biological Significance by the State Water Resources Control Board (*Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (1994) and amendments) or an area designated as an Area of Ecological Significance by the County of Los *Angeles (Los Angeles County Significant Areas Study, Los Angeles County Department of Regional Planning (1976)* and amendments) or an area designated as a significant natural area by the California Resources Agency. Refer to Table 3 for a listing.

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater.

"Infiltration" means the downward entry of water into the surface of the soil.

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

"Parking Lot" means land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with a lot size of 5,000 square feet or more, or with 25 or more parking spaces.

"Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces.

"Restaurant" means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812).

"Retail Gasoline Outlet" means any facility engaged in selling gasoline and lubricating oils.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Storm Event" means a rainfall event that produces more than 0.1 inch of precipitation and that, which is separated from the previous storm event by at least 72 hours of dry weather.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes, (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMP to be consistent with the code, except that to the extent that the standards in the SUSMP are more stringent than those under local codes, such more stringent standards shall apply.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system. The development must be designed so as to minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those

BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices* and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* , USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants.

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

Project plans must include BMPs consistent with local codes and ordinances and the SUSMP to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Utilize natural drainage systems to the maximum extent practicable
- Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the storm water conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are

effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system, the following Structural or Treatment BMPs are required:

- Materials with the potential to contaminate storm water must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- The storage area must have a roof or awning to minimize collection of storm water within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS.

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following Structural or Treatment Control BMP requirements (individual single family residences are exempt from these requirements):

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included or is required to include, Structural or Treatment Control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, the verification will include the developer's signed statement, as part of the project application, accepting responsibility for all structural and treatment control BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance. The transfer of property to a private or public owner must have conditions requiring the recipient to assume responsibility for maintenance of any Structural or Treatment Control BMP to be included in the sales or lease agreement for that property, and will be the owner's responsibility. The condition of transfer shall include a provision that the property owners conduct maintenance inspection of all Structural or Treatment Control BMPs at least once a year and retain proof of inspection. For residential properties where the Structural or Treatment Control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&Rs). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what storm water management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. The transfer of this information shall also be required with any subsequent sale of the property.

If Structural or Treatment Control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Structural or Treatment Control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR STRUCTURAL OR TREATMENT CONTROL BMPs

Structural or Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

Post-construction Structural or Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial,* (1993), or

3. the volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

Limited Exclusion

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical Structural or Treatment Control BMP design standard requirement only.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

REQUIREMENTS

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. The area in the site design must be:

- Self-contained and/ or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

The activity of outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must be:

- Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- The fuel dispensing area should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The

cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- The fuel dispensing areas must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all wash-water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. This area must be:

- Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor-vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL CONTAMINATION AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. A waiver of impracticability shall be granted only when all other Structural or Treatment Control BMPs have been considered and rejected as infeasible. Recognized situations of impracticability include, (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately petitioned by the Permittee and submitted to the Regional Board for consideration. The Regional Board may consider approval of the waiver justification or may delegate the authority to approve a class of waiver justifications to the Regional Board Executive Officer. The supplementary waiver justification becomes recognized and effective only after approval by the Regional Board or the Regional Board Executive Officer. A waiver granted by a Permittee to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPs

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

In lieu of conducting detailed BMP review to verify Structural or Treatment Control BMPs adequacy, a Permittee may elect to accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria established herein. The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date. Training conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, or the California Water Environment Association) may be considered qualifying.

14. RESOURCES AND REFERENCE

TABLE 1

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different storm water-filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Texas Nonpoint Source Book – Online Module (1998)www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Storm Water Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150
Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
National Stormwater Best Management Practices (BMP) Database, Version 1.0 Provides data on performance and evaluation of storm water BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000

SUGGESTED RESOURCES	HOW TO GET A COPY
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2

EXAMPLE BEST MANAGEMENT PRACTICES (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended/dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil/Water separators
- Catch basin inserts
- Continuous flow deflection/ separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

TABLE 3

HABITAT PROTECTION IN THE LOS ANGELES COUNTY AREA

Agency:
State Water Resources Control Board

Designation:
Areas of Significant Biological Significance (ASBS)

Definition:
Areas designated by the State Water Resources Control Board as requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable.

Affected Area:
(See Table 1 & Figure 2)

Agency:
Los Angeles County Department of Regional Planning

Designation:
Significant Ecological Areas (SEA)

Definitions:
Significant Ecological Areas (SEAs) are areas that have been identified by the Los Angeles County General Plan as containing unique or unusual species assemblages, or areas of habitat that are rapidly declining in the Los Angeles County. The SEAs were established to protect a special or sometimes unique collection of habitats and species from loss due to encroachment and human disturbances. However, SEAs are not intended to function as isolated preservation areas.

Affected Areas:
(See Table A & Figure 1)

Agency:
California Department of Fish & Game

Designation:
Natural Communities Conservation Plan Region (NCCP)

Definition:
Identifies and provides for the regional or area wide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth. The goal of the program is to protect sufficient resources in regional preserves to assure the survival of the ecosystem and, at the same time, permit compatible uses of less sensitive land.

Affected Area:
(See Table 1 & Figure 3)

TABLE 3 A

HABITAT PROTECTION IN LOS ANGELES COUNTY AREA1

Figure 1	AFFECTED AREA	DESIGNATION	DESIGNATING AGENCY
1.	Malibu Coastline	SEA	LACDRP
2.	Point Dume	SEA	LACDRP
3.	Zuma Canyon	SEA	LACDRP
4.	Upper La Sierra Canyon	SEA	LACDRP
5.	Malibu Canyon and Lagoon	SEA	LACDRP
5.	Malibu Creek State Park Buffer Area	SEA	LACDRP
6.	Las Virgenes	SEA	LACDRP
7.	Hepatic Gulch	SEA	LACDRP
9.	Cold Creek	SEA	LACDRP
10.	Tuna Canyon	SEA	LACDRP
11.	Temescal-Rustic-Sullivan Canyons	SEA	LACDRP
12.	Palo Comado Canyon	SEA	LACDRP
13.	Chatsworth Reservior	SEA	LACDRP
14.	Simi Hills	SEA	LACDRP
15.	Tonner Canyon/Chino Hills	SEA	LACDRP
16.	Buzzard Peak/ San Jose Hills	SEA	LACDRP
17.	Powder Canyon/Punte Hills	SEA	LACDRP
18.	Way Hills	SEA	LACDRP
19.	San Francisquito Canyon	SEA	LACDRP
20.	Santa Susana Mountains	SEA	LACDRP
21.	Santa Susana Pass	SEA	LACDRP
22.	Santa Fe Dam Floodplain	SEA	LACDRP
23.	Santa Clara River	SEA	LACDRP
24.	Tujunga Valley/Hansen Dam	SEA	LACDRP
25.	San Dimas Canyon	SEA	LACDRP
26.	San Antonio Canyon Mouth	SEA	LACDRP
27.	Portuguese Bend Landslide	SEA	LACDRP
28.	El Segundo Dunes	SEA	LACDRP
29.	Ballona Creek	SEA	LACDRP
30.	Alamitos Bay	SEA	LACDRP
31.	Rolling Hills Canyons	SEA	LACDRP
32.	Agua Amarga Canyon	SEA	LACDRP
33.	Terminal Island	SEA	LACDRP
34.	Palos Verdes Peninsula Coastline	SEA	LACDRP
35.	Harbor Lake Regional Park	SEA	LACDRP
36.	Madrona Marsh	SEA	LACDRP
37.	Griffith Park	SEA	LACDRP
39.	Encino Reservoir	SEA	LACDRP
40.	Verdugo Mountains	SEA	LACDRP

1 This list is a compilation of data from the Department of Fish & Game, State Water Resources Control Board, and the Los Angeles County Department of Regional Planning as of February 29, 2000. Areas in this may changes, as area are added or deleted by the designating agencies.

	AFFECTED AREA	DESIGNATION	DESIGNATING AGENCY
42.	Whittier Narrows Dam County Recreation Area	SEA	LACDRP
43.	Rio Hondo College Wildlife Santuary	SEA	LACDRP
44.	Sycamore and Turnbull Canyons	SEA	LACDRP
45.	Dudleya Densiflora Population	SEA	LACDRP
62.	Galium Grande Population	SEA	LACDRP
63.	Lyon Canyon	SEA	LACDRP
64.	Valley Oaks Savannah, Newhall	SEA	LACDRP
Fig.2	Point Dume to Latigo Point	ASBS	SWRCB
Fig.3	Palos Verdes Peninsula	NCCP	DFG

FIGURE 1

SIGNIFICANT ECOLOGICAL AREAS IN LOS ANGELES COUNTY

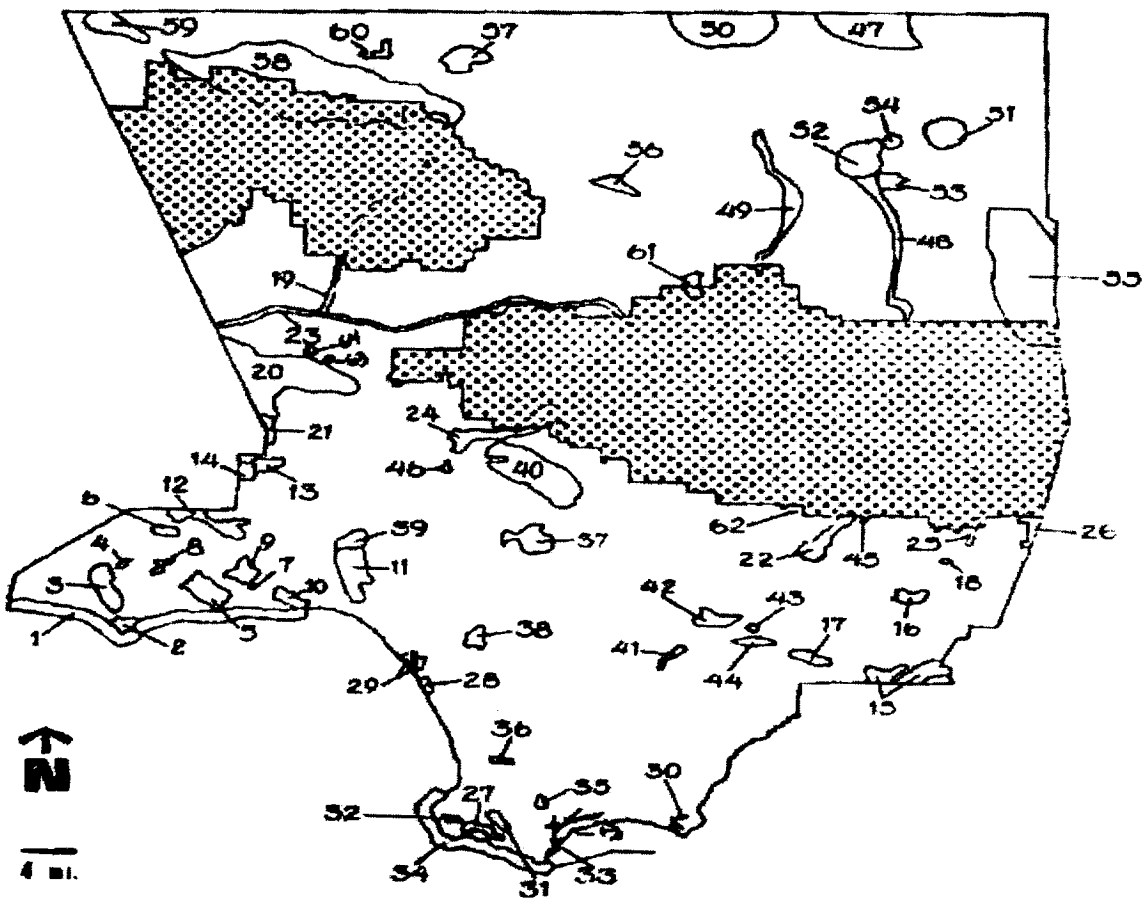


FIGURE 2

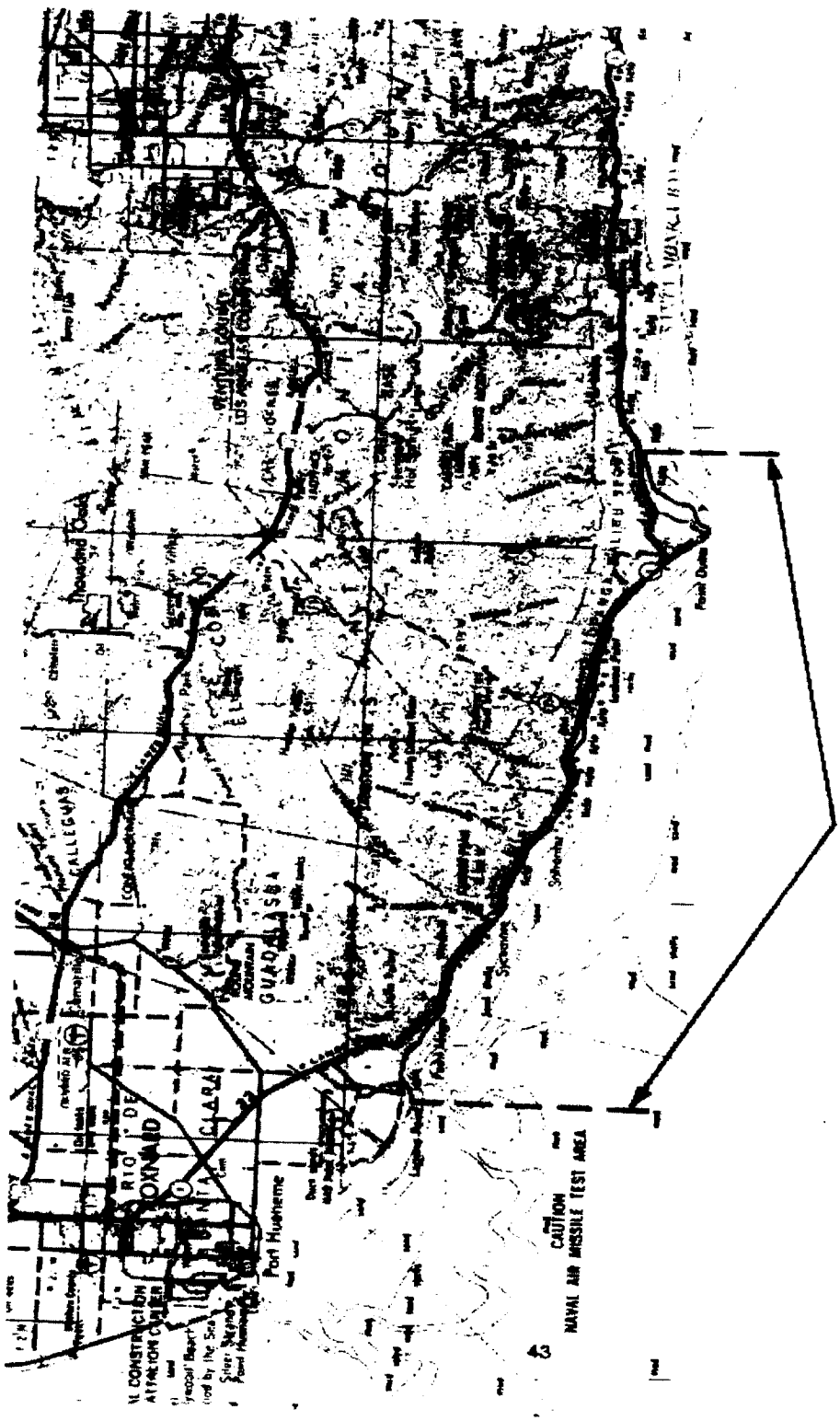
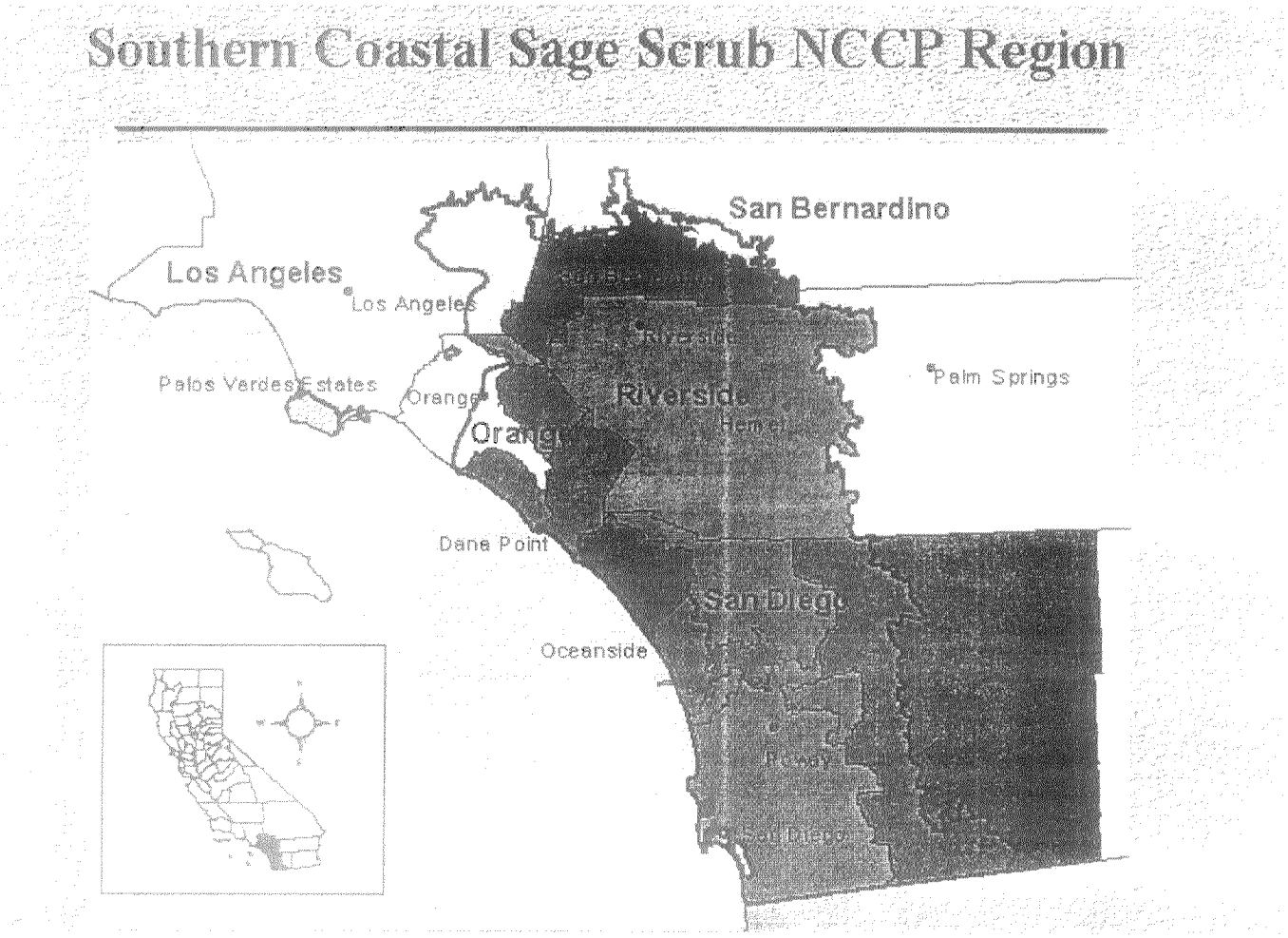


FIGURE 24
POINT MUGU TO LATIGO POINT
AREA OF SPECIAL BIOLOGICAL SIGNIFICANCE
Ref. Maps: USGS Point Mugu, CA
Point Dume, CA
Scale: 1 inch = 4 miles
Seaward boundary is 100-foot isobath or 1000 feet offshore, whichever is more distant.

(For enlarged delineation of boundary lines, SEE FIGURES 24a and 24b)

FIGURE 3


Southern Coastal Sage Scrub NCCP Region
San Bernardino
Los Angeles
Los Angeles
Riverside
Palm Springs
Palos Verdes Estates
Orange
Riverside
Orange
Dana Point
San Diego
Oceanside

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
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Gray Davis
Governor

May 4, 2000

Ms. Elizabeth Jennings
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 995812-0100

Dear Ms. Jennings:

ADMINISTRATIVE RECORD OF THE LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD – IN RE: THE CITIES OF BELLFLOWER, ET AL., CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000, ACTION OF THE REGIONAL BOARD AND IT EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUNOFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]). [SWRCB/OCC FILES A-1280, A-1280(a) AND A-1280 (b)]

We are transmitting, herein, the pertinent Administrative Record and Administrative Record Index in response to the above named Petitions that are for review before the State Board. Regional Board Counsel Leon submitted an advance copy of the Administrative Record Index to you via e-mail on May 2, 2000.

Please note we reserve the right to introduce additional documents into the Administrative Record, that may have been inadvertently omitted at this time.

Should you have any questions or need more information, please call me at (213) 576 –6654 or Parvaneh Khayat at (213) 576 – 6740, or Regional Board Counsel, Jorge Leon at (916) 657-2428.

Sincerely,

Xavier Swamikannu
Storm Water Program

Enclosure

cc: (Letter only) See mailing list

CERTIFICATION

State of California
County of Los Angeles

This is to certify that the enclosed materials, consisting of 14 volumes and 1000+, total pages including exhibits, constitute, to the best of my knowledge, a true and correct copy of the written administrative record and hearing tapes of the California Regional Water Quality Control Board, Los Angeles Region, in the matter of
Cities of Bellflower *et al.*, City of Arcadia, and Western State Petroleum Association

File No. SWRCB/OCC, A-1280, A-1280 (a), A-1280 (b)

Executed at 320 W. 4th Street, Los Angeles, in the County of Los Angeles,
This 4th day of May 2000.

(Name and title) Xavier Swamikannu
Acting Chief - Storm Water Program

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

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Gray Davis
Governor

May 5, 2000

Ms. Elizabeth Jennings
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 95812-0100

Dear Ms. Jennings:

RESPONSE TO PETITION – IN RE: THE CITIES OF BELLFLOWER, ET AL., CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000, ACTION OF THE REGIONAL BOARD AND IT EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUNOFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]). [SWRCB/OCC FILES A-1280, A-1280(a) AND A-1280 (b)]

Please find enclosed our "Response" in opposition to the Petition in the above matter.

If you have any questions or need more information, please call me at (213) 576 – 6605 or Dr. Xavier Swamikannu at (213) 576 – 6754, or Regional Board Counsel, Jorge Leon at (916) 657-2428.

Sincerely,

Dennis A. Dickerson
Executive Officer

Enclosure

cc: Jorge Leon, OCC, State Water Resources Control Board
Richard Montivedo, Esq., Rutan & Tucker
Stephen P. Deitsch, Esq., Mayer, Brown & Platt
Lyman C. Welch, Esq., Best, Best, & Krieger
David Beckman / Alex Helperin, Natural Resources Defense Council
Steven Fleischli, Santa Monica Bay Keeper
Heather Hoecherl/ Mark Gold, Heal the Bay
Interested Persons Mailing List (Letter only)

R0072532

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Counsel for Regional Board

XAVIER SWAMIKANNU
Regional Board Staff
320 W. 4th Street
Los Angeles, CA

BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BURBANK, CERRITOS, COMMERCE, DIAMOND BAR, DOWNEY, IRWINDALE, LA-CANADA FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, PALOS VERDES ESTATES, PICO RIVERA, POMONA, RANCHO PALOS VERDES, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, AND

THE CITY OF ARCADIA, a municipal corporation AND

WESTERN STATES PETROLEUM ASSOCIATION , a Trade Association

Petitioners,

v.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, and DENNIS DICKERSON, Executive Officer, Los Angeles Regional Water Quality Control Board.

Respondents,

File Nos.: A-1280; A-1280(a); A-1280 (b)

RESPONSE IN OPPOSITION TO ISSUES IN PETITION BY PETITIONERS ON ACTION BY THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, AND ITS EXECUTIVE OFFICER, DENNIS DICKERSON, PURSUANT TO BOARD ORDER NO. 96-054 (NPDES No. CAS614001) AND POINTS AND AUTHORITIES

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Bixby v. Pierno (1971) 4 Cal.3d 130

Clark v. City of Hermosa Beach, 48 Cal.App.4th 1152

Mohilef v. Janovici (1996) 51 Al.App.4th 267

City of Sacramento v. State of California (1990) 50 Cal.3d. 51

County of Los Angeles v. State of California 43 Cal.3d. 46

Natural Resources Defense Council v. U.S. EPA(9th Cir. 1992) 966 F.2d 1292

Natural Resources Defense Council v. Costle, (D.C. Cir. 1977) 568 F.2d 1369

Tonry v. Security Experts Inc., (9th Cir. 1994) 20 F.3d 967

United States v. State Water Resources Control Board(1986) 182 Cal.App.3d 82

Russian River Watershed Protection Committee v. City of Santa Rosa, (9th Cir. 1994) Case No. 97-15179

Defenders of Wildlife v. Browner (9th Cir. 1999) Case No. 98-71080

Arkansas v. Oklahoma, 503 U.S. 91.

Mathews v. Eldridge (1976) 424 U.S. 319

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I. INTRODUCTION

Petitioners who include municipalities and trade associations for the building industry and petroleum distributors, challenge the actions of the Regional Board and the Regional Board Executive Officer in adopting requirements for new development and significant redevelopment to control post-construction storm water pollution. Petitioners object to the requirements for various substantive and procedural reasons. In essence, Petitioners contend that the Regional Board has no basis in law or fact to adopt requirements for new development and significant redevelopment, unless these requirements are the same as those presented by Petitioner Permittees under the provisions of the Los Angeles County municipal separate storm sewer system Permit (hereafter, the "LA County MS4 Permit"). Petitioners also contend that they were denied due process because they were not provided additional notice and allowed more time to review the action of the Regional Board.

Petitioners misunderstand the very nature of the regulatory process and thereby invert the burden of proof in this case. Because they misunderstand the burden of proof, petitioners misconstrue what evidence is needed to support the requirements. This is not an enforcement action in which the Regional Board must show harm or violation. Rather, the starting place for analysis is that storm water discharges from large municipal separate storm sewer systems, to waters of the United States without permits are illegal. Once such discharges are regulated under an MS4 NPDES permit, the Permittees must implement a comprehensive storm water management program to reduce pollutants in storm water to the maximum extent practicable. The Regional Board need not demonstrate with empirical evidence that Petitioners are actually harming surface waters or conduct a cost-benefit analysis in order to ensure compliance with regulations, as Petitioners assert. Rather, the Regional Board must follow the requirements of the federal and state law and exercise best professional judgment in adopting and enforcing protective measures. The Regional Board, as the permit issuance and enforcement authority, is fully granted the charge to enumerate objective measures of compliance, including numerical mitigation criteria, to ensure enforceability of permit requirements.

The question therefore before the State Water Resources Control Board (hereafter "State Board") in this Petition is not whether the Regional Board carried its burden of evidence but rather did it properly execute its legal duties. A careful review of the entire record shows the Regional Board did so.

II. BACKGROUND

A. LOS ANGELES COUNTY MUNICIPAL STORM WATER PERMIT HISTORY

On June 18, 1990, the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Regional Board) adopted the first NPDES permit for Stormwater/Urban Runoff Discharged in Los Angeles County (Order No. 90-079). This Permit was issued on a system-wide basis for all the cities in Los Angeles County and the County of Los Angeles. The 1990 permit was challenged regarding its alleged failure to include specific water quality objectives and was upheld on May 16, 1991 in a decision issued by the State Water Resources Control Board (Order No. WQ 91-04; See also, WQ 91-03)

The LA County MS4 Permit was reissued on July 15, 1996, and made consistent with Federal Regulations for MS4s issued November 16, 1990. [55 Fed. Reg. 48073, Appendix F; 55 Fed. Reg. 48072)]. On June 10, 1997, the State Board dismissed a Petition filed by the City of Long Beach." On July 9, 1997, the City of Long Beach filed a Petition for Writ of Mandate/Complaint for Declaratory and Injunctive Relief before Superior Court. The court case was settled in May 1999, and under the terms of the settlement agreement the City of Long Beach was issued a separate MS4 Permit ("LB MS4 Permit") on June 30, 1999. The LB MS4 Permit contains similar requirements to the LA County MS4 Permit including requirements for Development Planning and Standard Urban Storm Water Mitigation Plans (SUSMPs).

B. NEW DEVELOPMENT REQUIREMENTS

The Los Angeles County MS4 Permit and the Long Beach MS4 Permit contain requirements that Standard Urban Storm Water Mitigation Plans (SUSMPs) be prepared for priority planning projects and that they include appropriate Best Management Practices (BMPs) and guidelines to reduce pollutants in storm water to the maximum extent practicable (Permit Pt. 2. III.A.)

On April 22, 1999, the Regional Board approved a List of BMPs for MS4 Permittees to select from and require implementation of the most effective BMPs in their Development Planning and Development Construction programs (Board Resolution No. 99-03)(A.R. xx) The Regional Board at that time also requested that the SUSMPs for Priority Planning Project categories, which incorporate the BMPs, be brought before it for discussion.1

Los Angeles County Department of Public Works (LACDPW), on behalf of the Permittees, submitted SUSMPs for Regional Board Executive Officer approval on July 22, 1999. These SUSMPs were revised and resubmitted on August 12, 1999, after a joint SUSMP workshop held on August 10, 1999, to clarify the meaning of some text. SUSMPs were submitted for: (i) 100+ home subdivisions; (ii) 10-99 home subdivisions; (iii) 100+ square-foot commercial developments; (iv) automotive repair facilities; (v) retail gasoline outlets; (vi) restaurants; and (vii) hillside located single-family dwellings. Prior to submittal to the Regional Board, draft versions of the SUSMPs were distributed to environmental groups, contractors, developers, consultants and trade industry groups for review and comment.

The Regional Board provided a Public Notice on August 16, 1999, that SUSMP requirements will be discussed before it on September 16, 1999, and invited comments from interested parties. Comments were received from municipalities, environmental groups,

1 Transcript of Proceedings, April 22, 1999. at

businesses, environmental consultants, and the building industry. Before the conclusion of the Hearing, the Regional Board Executive Officer requested that he be given more time to fully consider the issue and hold discussions with all interested parties to hear their concerns. The Regional Board authorized the Regional Board Executive Officer to proceed but directed him to bring the issue back to the Regional Board because of the broad interest in the community that the SUSMP requirements had generated.

On December 7, 1999, staff released a revised SUSMP (hereafter "Board SUSMP") for public review and comment. A "Summary of Comments and Responses" and a "Tentative Board Resolution" were included in the package mailed out with the Public Notice of Proposed Action at a special hearing scheduled for January 6, 2000. The Hearing was rescheduled to January 26, 2000, in deference to numerous requests from local government officials, building industry representatives, and others that it be postponed because of the intervening holiday season.

The Board SUSMP retained much of the language of the original SUSMPs submitted by Permittees, eliminated redundant language, consolidated similar requirements, and added some terms to ensure enforceability. As before the Board SUSMP included numerical design criteria for BMPs. In addition two new categories of designated priority planning projects were listed: (i) projects located adjacent to or discharging to environmentally sensitive areas, and (ii) parking lots with 25 or more parking spaces.

A week prior to January 26, 2000, Regional Board staff made available:(i) a Tentative Change Sheet to the December 7, 2000, Tentative SUSMP Draft, and (ii) the "Staff Report and Record of Decision" (A.R. Vol. 02). On January 26, 2000, the Regional Board held a nine-hour hearing and provided the opportunity for all parties to provide comments. All the same interested parties again submitted comments as before. At the conclusion of the public comment period, the Regional Board members discussed the issues, asked questions of staff, and provided direction to the Regional Board Executive Officer to approve the SUSMP with the Regional Board directed changes and staff proposed changes in the Change Sheet. At the same time, the Regional Board

adopted a Resolution to state that the SUSMP requirements are applicable to the City of Long Beach (except as noted) and that the numerical mitigation criteria establishes the standard for review in the Los Angeles Region for post-construction BMPs under the State General Construction Storm Water Permit (Order 99-08-DWQ

The Regional Board Executive Officer issued the Final Board SUSMP on March 8, 2000, together with a "Staff Report and Record of Decision – Supplement" and "Board Resolution" (No. R-00-02) (A.R. Vol. 14). On or after February 24, 2000, Petitioners filed a petition with the State Board requesting administrative review, challenging the actions of the Regional Board, and the actions of the Regional Board Executive Officer in issuing the Board SUSMP.

C. WATER QUALITY AND STORM WATER IN THE LOS ANGELES REGION

The water quality impacts of urbanization and urban storm water discharges have been summarized by several recent USEPA reports.2 Urbanization causes changes in hydrology and increases pollutant loads which adversely impact water quality and impair the beneficial uses of receiving waters. Increases in population density and imperviousness result in changes to stream hydrology including:

(i) increased peak discharges compared to predevelopment levels;

(ii) increased volume of storm water runoff with each storm compared to pre-development levels;

(iii) decreased travel time to reach receiving water; (iv) increased frequency and severity of floods;

(iv) reduced stream flow during prolonged periods of dry weather due to reduced level of infiltration;

2 *Storm Water Phase II Report to Congress* (USEPA 1995); *Report to Congress on the Phase II Storm Water Regulations* (USEPA1999); *Coastal Zone Management Measures Guidance* (USEPA 1992)

(v) increased runoff velocity during storms due to a combination of effects of higher discharge peaks, rapid time of concentration, and smoother hydraulic surfaces from chanellization, and

(vi) decreased infiltration and diminish groundwater recharge.

The LA County MS4 program conducts monitoring to:

(i) quantify mass emissions for pollutants,

(ii) identify critical sources for pollutants of concern in storm water;

(iii) evaluate BMP effectiveness, and

(iv) evaluate receiving water impacts.

The monitoring indicates that instream concentrations of pathogen indicators (fecal coliform and streptococcus), heavy metals (such as Pb, Cu, Zn,) and pesticides (such as diazinon) exceed state and federal water quality criteria.3 The mass emissions of pollutants to the ocean are significant from the urban Watershed Management Areas (WMAs) such as the Los Angeles River WMA, Ballona Creek WMA, and Coyote Creek WMA with the Los Angeles River WMA providing more than seventy percent of the loadings. Critical sources data for facilities (such as auto-salvage yards, primary metal facilities, and automotive repair shops) showed that total and dissolved heavy metals (Pb, Cu, Zn, and Cd), and total suspended solids (TSS) exceeded state and federal water quality criteria by as much as a hundred times. The results are consistent with a limited term study conducted by the Regional Board to characterize storm water runoff in the Los Angeles region before the issuance of MS4 permits.4 Storm water runoff data from predominant landuses showed similar patterns. Light-industrial, commercial and transportation landuses showed the highest range of exceedances. A pesticide (diazinon) showed higher ranges from residential landuse. The data for polycyclic aromatic hydrocarbons (PAHs), a known

3 Los Angeles County 1998-1999 Stormwater Monitoring Report, Los Angeles County Department of Public Works (1999). Data summarizes results of storm water monitoring for the most recent year and the past five years.

4 *Storm Water Runoff in Los Angeles and Ventura Counties, Final Report* (1988), California Regional Water Quality Control Board, Los Angeles, SCCWRP Contribution C292. This study found the highest mean concentrations of pollutants of concern such as heavy metals in the urban watershed rivers and that they contributed significant loads to the ocean.

pollutant of concern in urban storm water runoff, is inconclusive but improved analytical methods may yield more definitive results next year. Receiving water impacts studies found that storm water discharges from urban watersheds exhibit toxicity that are attributable to heavy metals. Biosurveys of the sea-bottom showed bioaccumulation of toxicants. Sediment analysis showed higher concentrations of pollutants such as Pb and PAHs than rural watersheds (2 to 4 times higher). In addition, toxicity of dry weather flows was observed with the cause of toxicity undetermined.5 Previous studies have found chemical concentration of pollutants that exceed state and federal water quality criteria in storm drains flowing to the ocean,6 and that there are adverse health impacts from swimming near them.7

Treatment BMP requirements on new development and redevelopment offer the most cost effective strategy to reduce pollutant loads to surface waters. Retrofit of existing development will be expensive and may be considered on a targeted basis. Studies on the economic impacts of watershed protection indicate that storm water quality management has a positive or at least neutral economic effect while greatly improving the quality of surface waters.8

D. APPLICABLE FEDERAL AND STATE AUTHORITY

1. Federal Authority

The Federal Water Pollution Control Act was adopted in 1948, amended in 1972, and amended in 1977 as the Clean Water Act of 1977 ("Clean Water Act"). Congress enacted the Clean Water Act "to restore and maintain the chemical, physical, and biological integrity of the Nations's waters." 33 U.S.C. § 1251(a). The Clean Water Act established the National Pollutant

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5 *Toxicity of Dry Weather Flow from the Santa Monica Bay Watershed*, Bay, S. et al (1996), Bull. Southern California Acad. Sci. 5(1), pp. 33-45. The paper describes preliminary results on dry weather toxicity which have been confirmed by the MS4 monitoring program.

6 *Chemical Contaminant Release into Santa Monica Bay, Final Report*, American Oceans Campaign , Santa Monica (1993)

7 *The Health Effects of Swimming in Ocean Water Contaminated by Storm Drain Runoff*, Haile, R.W. et al. (1999), Epidemiology 10: 355-363). The study found higher risks of respiratory and gastrointestinal symptoms from swimmers.

8 *The Economics of Watershed Protection*, T. Schuler (1999), Center for Watershed Protection, Endicott, MD. The article summarizes nationwide studies to support the statement that watershed planning and storm water management provide positive economic benefits.

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Discharge Elimination System (NPDES) that required permits for any discharge of pollutants from a point source pursuant to section 402 of the Clean Water Act. 33 U.S.C. § 1342. The Clean Water Act authorizes EPA or an authorized State to implement an NPDES permit program. 33 U.S.C. § 1342(a)(1) and (b). In 1987, recognizing the threat from stormwater runoff, Section 402 of the Clean Water Act was amended to add subsection 402(p) which established a statutory scheme for storm water runoff through NPDES permit requirements for municipal storm water discharges from Municipal Separate Storm Sewer Systems ("MS4s"). 33 U.S.C. §§ 1342(p). That section "established deadlines by which certain storm water dischargers must apply for permits, the EPA or states must act on permits and dischargers must implement their permits. "Natural Resources Defense Council v. U.S. EPA, 966 F.2d 1292, 1296 (9th Cir. 1992). States may administer NPDES programs after they have submitted a description of the program, a statement from the Attorney General to the Environmental Protection Agency ("EPA") a Memorandum of Agreement with EPA, and the program is approved. (33 U.S.C.§ 1342(b); 40 C.F.R. § 123.21 et seq.) The Administrator shall approve State programs which conform to the applicable requirements. (40 C.F.R. § 123.1(c)).

2. The California NPDES Permitting Authority

a. *NPDES Memorandum between EPA and the State*

The State of California is one of forty states with an approved State NPDES Program. This program has been in effect since 1973. The latest NPDES Memorandum of Agreement between the U.S. Environmental Protection Agency and The California State Water Resources Control Board approved by EPA on September 22, 1989 states as follows:

> "*The Chairman of the State Board and the Regional Administrator of the EPA, Region 9 hereby affirm that the State Board and the Regional Boards have primary authority for the issuance, compliance monitoring, and enforcement of all NPDES permits in California including NPDES general permits and permits for federal facilities; and ...permits to dischargers for which EPA has assumed direct responsibility pursuant to 40 C.F.R. 123.44...*"

b. *Attorney General's Statement for the State National Pollutant Discharge Elimination System Program*

In May 1987, the Attorney General of the State of California submitted its Statement of legal authority to implement a State National Pollutant Discharge elimination system program. Chapter 5.5 of the Water Code, Sections 13370 et seq., sets forth the specific sections relating to the NPDES program in California. Those sections were added to assure consistency with the Clean Water Act. U.S. EPA has certified California's NPDES programs and the Regional Board's authority to issue permits as part of the approved program. Water Code § 13377 specifically authorizes the Regional Board to issue NPDES permits:9 The EPA has approved the entire regulatory scheme set forth in the Porter Cologne Act that establishes a comprehensive statewide program for water quality administered regionally, through the State Water Resources Control Board and the nine regional boards, within a framework of statewide coordination and policy. (Water Code § 13000 *et. seq*)

c. *Summary of Applicable California Regulatory Program*

To obtain approval, a state must have adequate authority to implement requirements enumerated in the Clean Water Act. 33 U.S.C. § 1342(b). The Porter Cologne Water Quality Act is the controlling water quality law for California. The State Board and the nine Regional Boards implement the Act. (Water Code §§ 174, 13200). The Porter Cologne Act and its regulations include both general and specific sections for implementing the Clean Water Act Programs. (See Water Code § 13370 *et seq*). The Regional Boards adopt Regional Water Quality Control Plans ("Basin Plans") for each region. (Water Code § 13240). The Basin Plan covering the area of this Permit, was adopted by the Regional Board on June 13, 1994, was approved by the State Water Resources Control Board on November 17, 1994 and is a public document

9 "Notwithstanding any other provision of this division, the state board or the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge requirements ...which apply and insure compliance with all applicable provisions of the act and acts amendatory thereof or supplemental thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance." Water Code § 13374 states: "The term "waste discharge requirements" as referred to in this division is the equivalent of the term "permits" as used in the Federal Water Pollution Control Act, as amended."

generally available. The Basin Plan specifically discusses the NPDES permit program that regulates storm water runoff from land surfaces that flow into storm drains or directly into natural waterbodies during rainfall. The principal means of regulating activities, which may affect water quality and the principal means of implementing water quality control plans, is through issuance of waste discharge requirements.

Water Code § 13376 sets forth the Permittees duties to obtain waste discharge requirements.10 Section 13376 is modeled on the provisions of the Clean Water Act. (Compare § 13376, with Clean Water Act sections 301, 402, 33 U.S.C. §§ 1311, 1342) By prohibiting the "discharge of pollutants" except as in accordance with a state permit, in the form of waste discharge requirements, section 13376 requires waste discharge requirements for all discharges for which the Clean Water Act requires an NPDES permit.11

State Board regulations provide that a report of waste discharge is the equivalent of an NPDES Permit Application, and that reports of waste discharge for point source discharges

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10 . Section 13376 provides, in pertinent part: "Any person discharging pollutants or proposing to discharge pollutants to the navigable waters of the United States within this state...shall file a report of such discharge in accordance with he procedures set forth in section 13260....The discharge of pollutants...by any person except as authorized pursuant to waste discharge requirements....is prohibited...." § 13376. The terms"discharge," pollutants," and "navigable waters," as used in section 13376 and other provisions of Chapter 5.5 of the Porter-Cologne Act, have the same meaning as in the Clean Water Act. § 13373. The term "waste Discharge requirements," as used in Chapter 5.5. of the Porter-Cologne Act, is the equivalent of the term "permits," as used in the Clean Water Act § 13374.

11 Any person discharging waste or proposing to discharge waste that could affect the quality of waters of the state, must submit a *report of waste discharge* to the board. Water Code § 13260. A "discharge of waste", as used in the Porter-Cologne Act provisions on waste discharge requirements, includes, but is not limited to , any "discharge or runoff of a pollutant", within the meaning of the Clean Water Act. (33 U.S.C. § 1323, 1362). Specific authority for Clean Water Act Programs in the Porter Cologne Act include the issuance and enforcement of waste discharge requirements for both point and non-point sources. Waste discharge requirements may establish more stringent requirements than those required or authorized by the Clean Water Act. Water Code § 13377.

Where other provisions of the Porter-Cologne Act are inconsistent with Chapter 5.5, the provisions of Chapter 5.5 prevail to the extent of any inconsistency. Water Code § 13372. See State Water Resources Control Board No. WQ-80-19, State Board rejected an argument that Water Code § 13360 limits the authority of the state and regional boards to specify the manner of compliance with an NPDES permit. (See 33 U.S.C. § 1342(a)(1); see *NRDC, Inc. v. Costle*, 568 F. 2d 1369 (D.C. Cir. 1977)) In addition, EPA regulations adopted under the Clean Water Act authorize conditions in NPDES permits setting "best management practices" where numeric effluent limitations are infeasible or where reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the Act. 40 C.F.R. § 122.62K. "Best Management Practices" are defined to include, for NPDES permits, 'treatment requirement, operating procedures, and practices to control...sludge or waste disposal...' 40 C.F.R. § 122.2. Consequently, since the Clean Water Act authorizes the imposition of conditions including best management practices, in NPDES permits where limitations and standards have not been promulgated, the Porter-Cologne Act gives the State and Regional Boards the same authority. To the *extent that this authorization is inconsistent with the provisions of water code section 13360, the authority of the State and Regional Boards to implement the provisions of the Clean Water Act under Water Code Section 13377 must prevail. See Water Code Section 13372."* (State Board Order No. WQ 80-19 at pgs. 19-21.)

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to surface waters shall be filed and processed in compliance with U.S.EPA's NPDES program regulations. (22 Cal. Admin. Code §§ 2235(b), 2235.1, 2235.2) Thus, the Porter Cologne Act and state board regulations have incorporated by reference all EPA NPDES regulations applicable to the States. (40 C.F.R. § 122, 123, and 124)

d. *No requirement of specific water quality impact for permit issuance*

There is no requirement in state or federal law that either EPA or the State is required to obtain information on the impacts to water quality of the discharges of pollutants or waste prior to the issuance of a permit to that discharger. Any city with a population exceeding 100,000 that owns or operates a municipal separate storm sewer system pursuant to EPA regulations implementing Clean Water Act Section 402(p) is required to have a permit. The Clean Water Act requires U.S.EPA and the States to regulate, through the issuance of NPDES permits, all discharges of pollutants to the nation's waters. CWA § 402; *NRDC v. Costle,* 568 F. 2d 1369 (D.C. Cir. 1977). "A permit is required where the population figures are net or exceeded; issuance is not conditioned on proving actual impacts to water quality." (Order No WQ 95-2, May 17, 1995; 55 Fed. Reg. 222 at 48038.

The initial storm water regulations were based upon extensive studies, which documented impacts on water quality from large and medium urban areas. (*See Natural Resources Defense Council v. U.S. EPA*, 966 F.2d 1292 (9th Cir. 1992) *In Natural Resources Defense Council v. U.S. EPA,* the court rejected an exemption in the CWA for oil and gas facilities where storm water was uncontaminated. *Id.*, at p. 1305. The Court noted: "...by designating these light industries as a group that need only apply for permits if actual exposure occurs, EPA impermissibly alters the statutory scheme...no other classes of industrial activities are subject to the more lenient "actual exposure" test. *To require actual exposure entirely shifts the burden in the permitting scheme. Most industrial facilities will have to apply for permits and show the EPA or state that they are in compliance. Light industries will be relieved from applying for permits unless actual exposure occurs...The permitting scheme then will work only if these facilities self-report, or the EPA searches out the sources and shows that exposure is*

occurring...[T]he regulations appear to contemplate neither..." Id., at p. 1305. To condition a permit on proving actual impacts to water quality alters the statutory scheme and wrongly places the burden on the permitting agency instead of forcing a facility to prove that they are in compliance.12

IV. STANDARD OF REVIEW

The standard of review for this type of permit is statutory and is not based upon the denial of a fundamental vested right. Water Code section 13263(g) states that the discharge of waste into the waters of the State is a privilege, not a right.

The State Board's charge here in reviewing Regional Board actions is to determine whether the Regional Board has acted properly (Water Code § 13320). In exercising its independent judgment, however, the State Board must afford a strong presumption of correctness to the administrative findings, and the party challenging the administrative decision bears the burden to prove that the administrative findings are contrary to the weight of the evidence. (*Fukuda v. City of Angels* (1999) 20 Cal.4th 805, 815.) "Considerable weight should be given to the findings of experienced administrative bodies made after a full and formal

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12 In *NRDC v. U.S. EPA*, the court explained: "This case involves runoff from diffuse sources that eventually passes through storm sewer systems and is thus subject to the NPDES permit program.... One recent study concluded that pollution from such sources, including runoff from urban areas, construction sites, and agricultural land, is now a leading cause of water quality impairment. 55 Fed.Reg. at 47.991 " Id. at 1295. "The Nationwide Urban Runoff Program (NURP) conducted from 1978 through 1984 found that urban runoff from residential, commercial and industrial areas produces a quantity of suspended solids and chemical oxygen demand that is equal to or greater than that from secondary treatment sewage plants. 55 Fed. Reg. at 47.991. A significant number of samples tested exceeded water quality criteria for one or more pollutants. *Id.*, at p. 47, 992. Urban

hearing, especially in cases involving technical and scientific evidence. [Citation.]" (*Id.*, p. 812.) The State Board should give proper consideration to the Regional Board's expertise in the field of storm water pollution and related areas for the Los Angeles region. (*United States v. State Water Resources Control Board* (1986) 182 Cal.App.3d 82, 113.). Factual findings made by the Regional Board in the process of approving SUSMP requirements for new development should be reviewed under the clear error standard [*Tonry v. Security Experts Inc.*, 20 F.3d 967 (9th Cir. 1994)]. In the absence of a clear error of judgement of the facts, the State Board should uphold the Regional Board action.

In addition the State Board should deny Petitioners request for a stay of the requirements. Petitioners make up a small subset of the eighty-six MS4 municipalities in Los Angeles County, A stay would penalize the good-faith efforts of the larger number of the Permittees who, rather than petitioning the Regional Board's determination, are moving toward conformance with state and federal law. The State Board should take notice that the challenge to the SUSMP requirements is not unanimous.

V. ARGUMENTS

A. THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER'S APPROVAL OF REQUIREMENTS FOR NEW DEVELOPMENT AND REDEVELOPMENT ARE NOT ENFORCEMENT ACTIONS SUBJECT TO THE ADMINISTRATIVE REVIEW PROCESS SET FORTH IN ORDER NO 96-054

The Los Angeles MS4 Permit sets forth an Administrative Procedure to be followed by the Regional Board Executive Officer "for the review and acceptance of documents" and "to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to *initiating enforcement action*." Petitioners contend that the present process, by which the

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Regional Board considered approval of the SUSMP requirements, violates this process as set out in the Permit. Petitioners are grossly mistaken. The LA County MS4 Permit requires that SUSMPs be submitted to the Regional Board Executive Officer for approval. The action by the Regional Board and the Regional Board Executive Officer to approve the SUSMP was not an enforcement action but rather one of document review. The Regional Board's express statement at the September 16, 1999, hearing that the SUSMPs be brought before it for discussion voided the 120 day response condition stated in the permit for Regional Board Executive Officer approval documents (A.R. Vol. 12).13

Even if the Administrative Review provisions are found to apply, Petitioners' arguments that the Administrative Review process was not followed relies heavily on a premise that the Permit process provides significant notice, review and meet-and-confer protections that will benefit the Permittees. Those provisions must be considered in their full context, including, harm to the interest protected, and significantly, the deadline set forth in the permit for implementation. That deadline (July 30, 1999) has come and gone. Permittees submitted a final SUSMP to the Regional Board on August 10, 1999, well past the deadline. Because of the lapse of the deadline, the lack of countywide implementation of an effective SUSMP, and the impending expiration of Order No. 96-054 itself, the Regional Board was well within its right to consider the process prescribed in the permit for approval of a program implementation component to be obsolete.

Further, the Regional Board's action did not harm Petitioners interest protected by the Administrative Review process (i.e., ensuring conference with Regional Board staff to help resolve differences prior to formal action). The Regional Board Executive Officer met numerous times with Petitioners between August 1999 and January 2000 to listen to their concerns and communicate Regional Board expectations. During these discussions, several proposals were

13 Transcript of Proceedings, September 16, 1999.

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exchanged between the staff and the interested parties and the record in this matter now contains a substantial number of comments and responses. It is illustrative that Petitioners do not make the argument that actual prejudice derived from the Regional Board's failure to follow the process, but rather, seek to merely elevate form over substance.

The State Board should take note that the U.S. EPA, the federal agency with regulatory responsibility for implementation of the CWA in the U.S., endorsed the Regional Board Executive Officer's action in approving the SUSMP.14 The U.S. EPA also provided oral testimony at the January 26, 2000, hearing in support of changes directed by the Regional Board.15

Moreover, as a further consideration, the U.S. EPA's October, 1999 "NPDES Program Implementation Review" for the Los Angeles Region was critical of the process set forth in the Los Angeles County MS4 permit for model program approval because it had resulted in interminable delays.16

Given the circumstances of this matter, (i) the fact that the failure to follow the process has not deprive the Petitioners of any opportunity to discuss the SUSMP provisions and propose alternatives or any other protections, and (ii) the fact that the Regional Board's primary responsibility is to protect the water quality in the Region (Water Code Section 13000), the Board was well within its legal authority to approve the SUSMP presented by Regional Board staff with Board directed changes, rather than delay program implementation.

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14 See Letter of January 13, 2000 to Dennis Dickerson, Executive Officer from Alexis Strauss, Director, Water Division, U.S. EPA.

15 See Transcript of Proceedings January 26, 2000. at p 161. Ms. Alexis Strauss', Director, Water Division, U.S. EPA Region IX, statement that the Regional Board consider removing certain exemptions.

16 See NPDES Program Implementation Review: California Regional Water Quality Control Board 4, Los Angeles Region. USEPA, Region 9, Final Report – October 1999., at page 10 of 45. The report notes at page 28 that the process was "...hindering overall progress towards achieving permit objectives".

For these reasons, the State Board should reject Petitioners' claim that the Regional Board acted unlawfully in not following the Administrative Review Process described in the permit.

B. THE REGIONAL BOARD HAS FULL AUTHORITY UNDER THE CLEAN WATER ACT (33 U.S.C S 1251 *et seq.*) AND THE PORTER COLOGNE ACT (CAL. WATER CODE S 13000 *et seq.*) TO ESTABLISH MINIMUM CRITERIA TO ENSURE COMPLIANCE

Petitioner's argue that the Regional Board lacks authority under State and Federal law to establish objective criteria to determine compliance (SUSMP requirements) where Permittees are implementing the requirements of the Los Angeles County MS4 permit. Nothing could be further from the truth. Permittees by their failure to have an approved program to control storm water runoff from new developments and significant redevelopment have presumptively failed the statutory standard for compliance, i.e "reduce pollutants to the maximum extent practicable"

Petitioner's also contend that the Regional Board must demonstrate that the Board SUSMP requirements, because they differ from those submitted by the Permittees, will "reduce pollutants to the maximum extent practicable".

Petitioners' arguments turn the CWA and the Porter-Cologne Act on their heads. In essence, Petitioners assume they have a right to discharge pollutants under a MS4 permit with little or no controls absent a showing by the Regional Board that their activities are harmful or are not "reducing pollutants to the maximum extent practicable". This assumption impermissibly alters the statutory scheme set forth in the CWA and Porter-Cologne Act. To require evidence of actual discharge or that Permittees are not reducing pollutants or showing of harm entirely shifts the burden in the permitting scheme. To condition implementation of

requirements in a permit on proving actual impacts to water quality or showing sub-par implementation alters the statutory scheme and wrongly places the burden on the permitting agency instead of forcing a discharger to prove it is in compliance with the law. (See e.g., *Natural Resources Defense Council* v. *U.S. EPA* (9th Cir. 1992) 966 F.2d 1292 [court rejects an exemption in the CWA for oil and gas facility where storm water was uncontaminated; court says by designating these industries as a group that need apply for permits only if actual exposure occurs, EPA impermissibly alters statutory scheme.].)

Hence, there is no need to show with empirical evidence that Petitioners are required to implement specific storm water controls only where they are discharging pollutants or causing harm. Once the regulations require controls for storm water runoff from new development and significant development based on a general determination that pollutants could be discharged in storm water, a fact Petitioners never challenge, the Regional Board must interpret and enforce requirements in the permit as mandated by the Clean Water Act and Porter-Cologne sufficient to protect water quality. The only question, then, is whether the Regional Board followed the law in adopting the SUSMP requirements, and whether, in the exercise of its best professional judgment, the Regional Board properly exercised its authority to require definite criteria and other conditions for new development and significant redevelopment "to reduce pollutants in storm water to the maximum extent practicable"

The record establishes that urban stormwater runoff, from new development and redevelopment, poses a serious threat to surface waters because urbanization adds pollutants that are picked up from the ground and transported in storm water. (A.R. Vols. 09, 10). The record shows that scientific evidence justifies controls to mitigate runoff from 0.75 inch or equivalent of precipitation. Substantial deference should be accorded to a regulatory agency's reasonable and consistent held interpretation of its own regulations [*Arkansas v. Oklahoma*, 503 U.S. 91, 110 (1992)]. Federal courts have held that where an NPDES permit does not specify the manner in

which compliance is determined, the Regional Board's interpretation of the proper method to determine compliance should be given considerable deference, so long as it is reasonable [*Russian River Watershed Protection Committee v. City of Santa Rosa*, Case No. 97-15179, 9th Cir. (1998)]

It is revealing that Permittees initially included a numerical BMP design standard (0.6 inch) in an early SUSMP draft circulated among Permittees, but then had the numerical criteria removed (A.R. Vol. 10). It is not unreasonable to assume that Permittees did so in order to render the SUSMP unenforceable. Without an objective standard, there would be no definite design criteria to size BMPs for storm water quality. Developers and builders would then merely have to pay lip service to a vague and subjective standard that neither the Permittees could require compliance with nor the Regional Board could enforce.

Petitioners further claim that the List of BMPs approved by the Regional Board, pursuant to Board Resolution No. 99-03, by itself will ensure that Permittees have met the standard of compliance for new development and significant redevelopment. These statements are incorrect. The List of BMPs approved by the Regional Board constitutes a menu of BMPs considered by the Regional Board as appropriate for the control of pollutants from new development and significant redevelopment. However, "to reduce storm water pollutants to the maximum extent practicable" through structural and treatment controls for new development and significant redevelopment, three elements would be necessary, (i) best combinations of BMPs (ii) sized based on water quality equivalent design standards, and (iii) selected to reduce the pollutants of concern. Only the first element has been satisfied by Permittees when they incorporate the Board approved BMPs List into their program. The Permittees SUSMP failed because it lacked the second element. The third element does not come into play until the time when Permittees review development plans submitted by builders and developers. Permittees therefore can be presumed to have failed to comply with the requirements of the Clean Water Act.

Also, the Regional Board's action in setting definite criteria for the control of pollutants in storm water from new development and significant redevelopment is consistent with a recent State Board ruling, that storm water permits include clear requirements to achieve compliance. (Order WQ 98-01) 17

Thus, Petitioners' claim that the Regional Board lacks the authority to impose definitive requirements for new development and redevelopment must be rejected.

C. THE REGIONAL BOARD PROPERLY NOTICED THE ACTION, PROVIDED ADEQUATE TIME FOR PUBLIC REVIEW, AND CONDUCTED A FAIR HEARING

Petitioners contend that the Regional Board violated their due process rights by failing to provide Petitioners sufficient notice prior to the public hearing of their proposed actions and sufficient opportunity to be heard prior to taking action. At issue appears to be the Change Sheet dated January 25, 2000. The Change Sheet was provided for Regional Board consideration, in large part to make changes to the SUSMP considered reasonable, and requested by Permittees, through their comment letters (See A.R. Vol. 02). Petitioners also contend that the Regional Board made substantive changes to the SUSMP after the close of the public comment period on January 26, 2000.

The procedural history of the Regional Board action shows that Petitioners were given "first opportunity" to draft the SUSMP requirements and submit them through the LACDPW to the Regional Board Executive Officer for approval. Several versions of the SUSMP were circulated for almost six months before a final document was submitted to the Regional Board on July 21, 1999. This document was again revised and resubmitted on August 12, 1999. Regional Board staff conducted a technical workshop on August 10, 1999, with testimony from national experts to discuss the fundamental principles for the control of pollution from new

17 In Re: Environmental Health Coalition, Order WQ 98-01, at 11. The State Board upheld the MS4 permit issued by the San Diego Regional Board but found it necessary to state, "storm water permits [should] contain the strongest and clearest possible language to protect water quality"

development and redevelopment. (A.R. Vol. 10) Further, the Regional Board conducted an information workshop on September 9, 1999, to hear comments on staff recommended SUSMP requirements. Before the adoption of the SUSMP requirements on January 26, 2000, the Regional Board held two workshops, and Regional Board staff conducted several consultative meetings with various interests including Petitioners. Extensive testimony was allowed on the SUSMP requirements at all these times. Regional Board staff also made several appearances at local council of governments and regional planning agency meetings to discuss the requirements.

On December 8, 1999, the Regional Board circulated the tentative Board SUSMP along with a document entitled "Response to Comments" summarizing comments and responding to whether or not certain suggested revisions were accepted or declined and why. In addition, on January 18, 2000, the Regional Board released a "Supplemental Response to Comments" and "the Staff Report and Record of Decision".(A.R. Vol. 02) The Regional Board approved the Final SUSMP on January 26, 2000, after nine hours of testimony and Board discussion. At that meeting, the Regional Board considered all testimony and directed that the Regional Board Executive Officer make certain revisions. (A.R. Vol. 12) Petitioners claim they were denied due process under the state and federal Constitutions because they were not allowed additional period for notice, review, and comment for the Board directed changes.

The Regional Board complied with the federal procedural requirements for adopting NPDES permits under section 124 of Title 40, Code of Federal Regulations and with Water Code Section 13377. The Regional Board circulated the tentative SUSMP for thirty days, held a hearing on the contested item, made revisions in response to comments, and prepared a document containing responses to those comments. The final revisions to the SUSMP made after the close of the public comment period were made in response to oral testimony.

Petitioners claim the revisions constituted significant changes, which required further comment. A close examination of the record, however, demonstrates that the Regional Board fully considered all material presented and made decisions consistent with their

responsibilities under the Water Code Section 13225(a). While the issues might have been significant, as illustrated by the considerable time and effort that the Regional Board invested in its consideration, the issues were not new issues. The record will indicate that the same concerns were communicated orally and in writing some months before, not just on January 26, 2000.

Petitioners specifically contend that application of the SUSMP requirements to all projects (not just "discretionary projects") and elimination of the "roof-top" exemption constitutes significant changes that require new notice. Both terms, as originally set forth prior to Board modification, convey limitations that had been proposed by Permittees in the development of the proposal presented to the Board in order to restrict the scope of the application of the SUSMP requirements. The Regional Board was well within its regulatory authority to find that the proposed limitations have no basis in permit, statute, or regulation and to eliminate them thus giving the SUSMP requirements the broadest application. Following Petitioners' argument about due process to its logical conclusion would mean that the Regional Board could never complete public deliberations and conclude permitting actions.18 There is simply no due process violation under the facts of this case.

Petitioner asserts that it was denied a fair hearing because: (1) Regional Board failed to provide Petitioner with adequate time to address its concerns with the SUSMP, and the opportunity to prepare evidence against requirements at the hearing on January 26, 2000; (2) Regional Board made significant changes to the SUSMP requirements after the close of public comment on the date of the hearing; (3) Regional Board did not provide Petitioner with adequate notice of the new SUSMP requirements before it was reviewed and approved;

Government Code Section 11125 requires that the public be provided 10 days notice of business to be transacted by a state body. The transmittal letter attached to the December 7, 1999 tentative SUSMP provided interested parties some 50 days of notice. Additionally,

18 Notably, these permits apply for only five years. (40 C.F.R. § 122.46.) If petitioners had their way, the Regional Board would never be able to require its implementation.

Respondent has not violated any regulations pertaining to a pre-hearing public comment period because no such regulations exist.

Section 648.3 of the Board regulations contains the procedural requirements that governed the January 26 hearing. (CCR § 648.3.) This section directs that all "adjudicatory proceedings be conducted in such a manner as the Board deems most suitable to the particular case with a view toward securing relevant information expeditiously without unnecessary delay and expense to the parties and to the Board." (CCR § 648.3(a).) The regulations do not require precise technical specificity with regard to procedure. Rather, they suggest a more common-sense approach to hearing procedure than is required in trial settings. (*See* CCR § 648.4(a) "The proceedings will not be conducted according to technical rules relating to evidence and witnesses.") *The regulations give no indication of the length of time that should be allotted to each speaker.* The regulations give no guidance as to what documents must constitute the administrative record. The regulations simply conclude that "[a]ny final decision made pursuant to evidence introduced at an adjudicatory hearing shall be based on the record and shall include a statement of the reasons for the decision, and where appropriate, findings and conclusions." (CCR § 648.7.)

The procedural requirements of the federal Clean Water Act (CWA) provide a source of reference for state permit programs. The federal regulations promulgated under the CWA provide specific procedures for issuing, modifying, revoking, and reissuing NPDES permits. (40 C.F.R. § 124 et seq.) The regulations list the provisions of the CWA that may be implemented by state programs. (40 C.F.R. § 123.25.) According to the regulations, "[s]tates need not implement provisions identical to the listed provisions. Implemented provisions must, however, establish requirements at least as stringent as the corresponding listed provisions." (*Id.*)

The section pertaining to public notice and comment provides that a single notice may be used by the Regional Board to provide public notice of both the proposed permit action and the scheduled hearing. (40 C.F.R. § 124.10(b)(2).) The notice must be given at least 30 days before

the public hearing and it must allow at least 30 days for public comment. (40 C.F.R. § 124.10(b)(1), (2).). 19

In each of the cases that Petitioners cite to support the argument that it was denied a fair trial, the hearings involved therein affected vested, fundamental rights such as a public employee's right to continued permanent employment, (*English v. Long Beach*, (1950) 35 Cal.2d 155), and the right to pursue an occupation (*Bank of America v. Long Beach*, (1975) 50 Cal.App.3d 882). Both of these cases involve rights that were already possessed by the individual and which therefore are fundamental and vested. (*Bixby v. Pierno* (1971) 4 Cal.3d 130, 146.) Accordingly, the procedural protections required in these cases are not germane to the instant proceeding, which did not affect a vested right. The California Water Code specifically indicates that a discharge of waste into state waters via an NPDES permit is a privilege, *not a vested right*. (Water Code § 13263(g) (emphasis added).) An administrative proceeding that does not affect a vested interest does not implicate the procedural protections of the due process clause. (*Clark v. City of Hermosa Beach*, 48 Cal.App.4th 1152, 1178. (1996))

Petitioners cite no cases that involve the type of administrative permit proceeding that is at issue here. Moreover, each of the cases cited by Petitioner involved egregious abuses of discretion by the City of Long Beach that resulted in the court finding a prejudicial denial of a fair hearing. No such egregious actions are present in this matter. Even assuming that Petitioner does have a protected interest, the procedures used by Respondent at the January 26, 2000, hearing are consistent with the flexible requirements of procedural due process and should be accorded great weight.

19 The federal regulations governing adjudicatory hearing procedures and format do not apply to state-operated NPDES programs, and are only applicable to EPA-issued permits. (40 C.F.R. § 124.71.)

"[T]here is no precise manner of hearing which must be afforded; rather the particular interests at issue must be considered in determining what kind of hearing is appropriate ... [w]hat must be afforded is a reasonable opportunity to be heard." (*Saleeby v. State Bar*, (1985) 39 Cal.3d 547, 565.)20

In *Mohilef v. Janovici*, (1996) 51 Cal.App.4th 267, the Court held that due process is satisfied as long as the petitioner is given a meaningful opportunity to respond to the charges against him and recognized that substantial weight must be given to the agency's judgment and procedures:

"[D]ifferences in the origin and function of administrative agencies preclude the wholesale transplantation of the rules of procedure, trial, and review which have evolved from the history and experience of courts....In assessing what process is due..., substantial weight must be given to the good-faith judgments of the [agency] that [its] procedures ... assure fair consideration of the ... claims of the individuals." (*Mohilef*, 51 Cal.App.4th at 288-289 (quoting *Mathews v. Eldridge*, (1976) 424 U.S. 319, 348-349).)

The Supreme Court later reiterated this principle in *Vermont Yankee Nuclear Power Corp. v. NRDC* (1978) 435 U.S. 519 by noting that:

"[A]dministrative agencies should be free to fashion their own rules of procedure and to pursue methods of inquiry capable of permitting them to discharge their multitudinous duties." (*Id.* at 543.)

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20 In *Saleeby*, the Court concluded that the State Bar was not required to provide petitioner with a formal hearing so long as petitioner was afforded a "reasonable opportunity to raise objections to the particular application the bar desires to take." (*Id.* at 566.) Like the respondent in *Saleeby*, the Respondent in the instant case did not offend due process because Petitioner was given ample opportunity to raise objections and comment on the draft permit, and it availed itself of these opportunities both prior to and during the hearing. In *CEEED v. California Coastal Zone Conserv. Comm'n*, (1974) 43 Cal.App.3d 306, the Court held that the system for coastal zone permits under Coastal Conservation Act of 1972 fully guaranteed procedural due process to permit

In light of the comprehensive public comment history of the proposed permit and the significant degree of deference that is accorded administrative agencies, Respondent clearly provided Petitioner with a meaningful opportunity to present its concerns and comments, and thus Petitioner was provided with a fair hearing.

For the reasons enumerated, Petitioners arguments that they were not provided adequate notice and were denied a fair hearing must be set aside.

D. THE ACTIONS OF THE REGIONAL BOARD TO APPLY OBJECTIVE AND ENFORCEABLE REQUIREMENTS ARE CONSISTENT WITH THE AUTHORITY GIVEN IT BY THE CLEAN WATER ACT AND THE PORTER COLOGNE ACT.

Petitioners argue that the SUSMP requirements, including numerical mitigation standards, approved by the Regional Board impose new requirements in excess of those set forth in the permit, and the action procedurally and substantively modifies the permit.

The LA County MS4 permit set up a process for Petitioners' to develop conditions for new development and significant redevelopment to control storm water pollution. The requirement in the permit that the Regional Board Executive Officer approve the conditions was to ensure that the final SUSMP, is sufficient and enforceable under state and federal law. The record is clear and convincing that the SUSMPs proposed by Permittees fell short of the legal standard for adequacy. Further, the interminable delay that ensued with the back and forth submittal and review of other model programs clearly indicated that the administrative approval process followed by the Respondent was hampering its regulatory obligation to ensure that Permittees comply with the Clean Water Act, a deficiency also identified by the U.S. EPA in its Report (A.R. Vo. 8).

Because there is no express national standard for the control of storm water pollutants from new developments, one must defer to statements of policy and intent made by the U.S.EPA. The U.S.EPA under Phase I regulations did not fully describe the expectations for MS4 Permittees in controlling post construction storm water discharges from new development and significant redevelopment except that "a comprehensive master plan" was required [55 Fed Reg. 48054]. For a better understanding, we look to the Final Rule for Phase II storm water regulations. Therein, the U.S.EPA notes that "prior planning and designing for the minimization of pollutants in storm water is the most cost-effective approach to storm water quality management" [64 Fed Reg. 68759], and identifies four essential elements to control storm water from new development and redevelopment. These are, (i) to develop and implement strategies that include a combination of structural and non-structural BMPs; (ii) adopt an ordinance to address post construction runoff; (iii) ensure long term operation and maintenance of the BMPs; and (iv) ensure that controls are in place that will *minimize* water quality impacts. [Emphasis added] EPA goes on to say:

> "The requirements .....[are] consistent with the permit application requirements for large MS4s for post-construction controls for new development and redevelopment."

The SUSMP requirements approved by the Regional Board achieve all four enumerated objectives for new development and redevelopment. Petitioners SUSMP failed to implement three of these four objectives.

Further, the Federal Court of Appeals has unequivocally stated that Congress intended for "the Administrator or a State to design [substantive] controls" for storm water discharges from MS4s but did not mandate a particular approach [*NRDC v. USEPA*, 966 F.2d 1292 (9th Cir. 1992)]. The court held that it is appropriate to defer to U.S.EPA [and the State] where the agency supplied a "reasoned explanation".

The record will show that the Regional Board has provided more than a "reasoned explanation" for its action. The establishment of definite criteria to evaluate compliance with requirements to control storm water pollution from new development and redevelopment does not constitute an amendment. Petitioners were provided the opportunity to develop one, and failed to do so. Thus, the Regional Board under due diligence had no option but to independently research and develop a standard that would ensure that BMPs are adequately designed to reduce pollutants in storm water runoff from new development. Nothing in State of Federal law prohibits such an act. In fact, failure by the Regional Board to affirmatively establish such a standard under the circumstances would have been a dereliction of responsibility under the Clean Water Act and the Porter Cologne Act.

E. THE REGIONAL BOARD'S REQUIREMENT OF NUMERICAL DESIGN STANDARDS FOR TREATMENT CONTROL AND STRUCTURAL BEST MANAGEMENT PRACTICES IS TECHNICALLY DEFENSIBLE, AND NOT ARBITRARY AND CAPRICIOUS

Petitioner's argue that the Regional Board's numerical design standard is arbitrary and capricious, yet provide no evidence in support of the claim. To the contrary, the technical basis for design standards for post-construction BMPs is discussed in detail in the "Staff Report and Record of Decision" and the calculations have been made part of the Administrative Record.

Similar standards for the design of post-construction BMPs have already been adopted by a number of municipalities subject to Phase I storm water regulations. These design standards are considered by these municipalities to meet the statutory standard for control of storm water discharges from new development and significant redevelopment.21 The State Board should note that some of the foremost national storm water experts have submitted letters in support of

21 .WEF Manual of Practice No. 23. The manual discusses the basis for the sizing of storm water quality BMPs and adds,.."the 80th percentile runoff event is now considered by municipalities ...to be cost-effective...and the design that achieves MEP definition of the Clean Water Act."

the numerical design standard set by the Regional Board.22 (A.R. Vol. 7) In addition, several States, including Washington, Florida, and Maryland have imposed similar requirements on a statewide basis pursuant to their implementation of the Federal Phase I storm water regulations.

It is also relevant, from a burden consideration, that the numerical mitigation standard required by the Regional Board is less than categorical effluent limitations for storm water set by the U.S. EPA for combined animal feedlot operations or for sediment removal from construction sites or new development BMP design criteria applied in the Pacific Northwest. (A.R. Vol. 09).

Petitioners' claim that the requirements are arbitrary and capricious must therefore be set aside as a ploy to escape regulation.

F. THE REGIONAL BOARD IS NOT REQUIRED TO SEPARATELY PROVIDE EVIDENCE OF COST-EFFECTIVENESS OR PERFORM A COST-BENEFIT ANALYSIS WHEN IMPLEMENTING AND ENFORCING A FEDERAL REGULATORY REQUIREMENT

Petitioners contend that the Regional Board failed to conduct a cost-benefit analysis and consider the economic impacts of the SUSMP requirements. A separate economic analysis is not required when implementing a federal regulation. Nevertheless, Regional Board staff conducted an economic impact evaluation of the SUSMP requirements on an actual project, in the pipeline for approval at the City of Los Angeles. The analysis determined that the cost of compliance with the requirement amounted to less than one percent of the project cost. This analysis is discussed in the "Record of Decision and Staff Report" and the calculations have been made part of the Administrative Record. A relative comparison of the economic cost of the Board SUSMP standard with other similar standards indicate that the cost was a fraction of the cost of the other standards to manage storm water to reduce water quality impacts. [A.R. Vol. 09] 23

22 See A.R. Vol. 07. Letters submitted by Prof. M. Stenstrom- UCLA, Prof. R. Pitt- U. of Alabama, Prof. R Horner- U. of Washington, and Tom Schuler - Center for Watershed Protection.

23 Transcript of Proceedings, January 26, 2000. at 39

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In contrast, Petitioners have provided no evidence to substantiate the claim that the numerical design standard is not cost-effective. Thus Petitioners argument that the Regional Board's requirements for new development are not cost-effective must be rejected.

G. THE REGIONAL BOARD IS AUTHORIZED BY THE CLEAN WATER ACT AND THE PORTER-COLOGNE ACT TO REQUIRE ALL MEASURES NECESSARY TO ENSURE THE PROTECTION OF RECEIVING WATER QUALITY

The Regional Board has the authority to adopt the Board SUSMP requirements and numerical mitigation standards for new development and significant redevelopment. The LA County MS4 permit requires that each of the Permittees develop an Urban Storm Water Mitigation Plan following the model approved by the Regional Board Executive Officer.24 The Regional Board action adopted the model, or Standard Storm Water Mitigation Plan for the Permittees to follow.

Although the LA County MS4 permit provides that the Regional Board Executive Officer has authority to approve the model program, as proposed, the Board SUSMP was submitted to the Board itself for review and endorsement at the January 26, 2000, meeting. Following consideration by the Board, the Regional Board Executive Officer approved the SUSMP for Los Angeles County Permittees. The Board approved SUSMP was released on March 8, 2000. In addition, the Board adopted a resolution that made the SUSMP applicable to the City of Long Beach. This was required because the City of Long Beach has a storm water permit (Order No. 99-060) separate from the one applicable to other cities in the County.

The Board approved SUSMP requires, *inter alia,* that (a) post-construction treatment control BMPs be required for nine categories of development and (b) the BMPs be designed to

24 Los Angeles Municipal Permit, (Part III.A., at Page 31.)

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mitigate (treat or infiltrate) the runoff from all storms up to 0.75 inch of rainfall for 24-hour period or equivalent runoff volume. As discussed in detail in "Background", these requirements are based upon application of provisions of the Clean Water Act (CWA), section 402(p). The federal provisions require that a storm water program:

> "* * *
>
> (ii) Shall include a requirement to effectively prohibit non-storm water discharges into storm sewers; and
>
> (iii) Shall require controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [Section 402(p)(3)(B), USC Section 1342(p)(3)(B), emphasis added.]

The proposal is an effort to meet the Clean Water Act requirements. In a 1992 decision, the U.S. Court of Appeals for the Ninth Circuit (*NRDC v. U.S.EPA*, 966 F.2d 1292) interpreted the above language as providing the Administrator or the State with substantial authority:

> "[t]he language in (iii), above, requires the Administrator or the State to design controls. Congress did not mandate a minimum standards approach or specify that U.S. EPA develop minimal performance requirements...we must defer to U.S. EPA on matters such as this, where U.S. EPA has supplied a reasoned explanation of its choices."

The decision in essence holds that the U.S. EPA and the States are authorized to require implementation of storm water control programs that, upon "reasoned explanation," accomplish the goals of Section 402(p).

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Moreover, in a very recent decision, the Ninth Circuit Court of Appeals reinforced the U.S. EPA's and the State's authority in this area. In *Defenders of Wildlife v. Browner* (1999) Case No. 98-71080, the Ninth Circuit Court of Appeals reviewed an action of the U.S. EPA to adopt a Storm Water Management Program in the State of Arizona. That program included best management practices such as storm water detention basins, retention basins, and infiltration ponds. The question was whether the U.S. EPA can require numeric limitations to ensure strict compliance with the state water-quality standards. The Court concluded that the CWA does not require strict compliance; however, citing the language of (iii), above, it stated: "[t]hat provision gives the U.S. EPA discretion to determine what pollution controls are appropriate. As this court stated in *NRDC v. U.S. EPA*, 'Congress gave the administrator discretion to determine what controls are necessary...[cites omitted] (at page 11687).

The Board SUSMP meets the Clean Water Act Section 402(p) requirements and Regional Board staff has provided a "reasoned explanation of its choices" in the SUSMP "Record of Decision and Staff Report", the "Record of Decision and Staff Report - Supplement" and the accompanying materials. (A.R. Vol. 14) Accordingly, the Board SUSMP requirements are well within the Regional Board's authority to regulate MS4 discharges.

Petitioners' arguments must thus be rejected.

H. THE REGIONAL BOARD ACTION DOES NOT VIOLATE CALIFORNIA WATER CODE SECTION 13360

Petitioners contend that the Regional Board's action violates Water Code § 13360 because it prohibits the Regional Board from specifying the manner of compliance. In Part the Water Code Section reads,

"No waste discharge requirement or other order...shall specify the design, location, type of construction.... or particular manner in which compliance may be had"

The Board SUSMP requirements set a numerical design standard for the control of storm water pollutants from new development and significant redevelopment. Petitioners' challenge here focuses on this one issue, although it is not articulated in that manner.

The Board included a design standard in the SUSMPs in order to establish an objective measure to evaluate compliance with the statutory standard of MEP contained in federal and state law. Thus, the numerical design criteria in the SUSMP are more similar to technology standards, such as Best Available Technology (BAT), applied to traditional point source discharges. These standards have broad technical reach...and are not unique to any singular approach. Further, the Regional Board provided four equivalent methods to derive the volume of storm water to be treated to remove pollutants. The record establishes clear technical and regulatory bases to include the criteria. Note also that these are minimum standards and Petitioners can use stricter criteria. 25

Petitioners claim that the Regional Board action to include a numerical BMP design standard in the SUSMP for new development, in essence *specifies design and the manner of compliance* [emphasis added] is patently false, and must be rejected

I. THE REGIONAL BOARD ACTION DOES NOT VIOLATE THE UNFUNDED MANDATE PROVISION OF THE CALIFORNIA CONSTITUTION

Petitioners assert that the Regional Board by its action has imposed requirements in excess of the federal mandate, and therefore is in violation of the State Constitution prohibiting unfunded mandates. Petitioners' analysis of this issue is incorrect and misleading. Petitioner omitted the most important sections of the implementing state statutory language and omitted the

25 Transcript of Hearings, January 26, 2000. At 292, See Regional Counsel Leon's response to the non applicability of Water Code Section 13360 here

key language in the cases they cited. The California Constitution, Article XIII B, Section 6 states:

> "Whenever the Legislature or any state agency mandates a new program or higher level of service on any local government, the state shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service....(Cal. Const. Art. XIIIB, § 6). Government Code §§ 17500 through 17630 were enacted to implement Article XIII B, section 6.

This section was not intended to cover a *PERMIT OR ORDER OR REQUIREMENTS THEREIN* issued by a regulatory agency of state government imposing federal requirements upon parties prohibited from discharging waste into the waters of the State and the United States under both state and federal law. If Petitioners' analysis was correct, every Permittee could file a "Claim" for reimbursement to comply with regulatory actions, claiming that they require a "new program" or an "increased level of service." The Constitution addresses reimbursement for additional "services" mandated by the State upon local agencies, not regulatory requirements imposed upon all Permitees, including cities and counties. The intent of the constitutional section was not to require reimbursement for expenses incurred by local agencies complying with laws that apply to all state residents and entities. (See *City of Sacramento v. State of California*, 50 Cal.3d. 51 (1990) citing *County of Los Angeles v. State of California*, 43 Cal.3d. 46.

In addition, two exemptions exist. One exemption applies if "the local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the mandated program or increased level of service." (Government Code § 17556(d). Government Code § 17556(c) exempts claims where "the statute ...implemented a federal law or regulation and resulted in costs mandated by the federal government, unless the statute...mandates costs which exceed the mandate in that federal law or regulation."[emphasis added].26

26 Gov. Code § 17514 provides: "costs mandated by the state" means any increased costs which a local agency or school district is required to incur after July 1, 1980, as a result of any statute enacted on or after January 1,

1975, which mandates a new program or higher level of service of an exsiting program within the meaning of Section 6 of Article XIII B of the California Constitution."

The Permit provisions to which Petitioners object are consistent with the Clean Water Act and federal regulations and are not more stringent than the federal requirements. Moreover, the permit does not create a state "program" to be administered by the local agency, transferring fiscal responsibility for "services" to be extended to the public. The requirements to control runoff from new development and redevelopment are federally imposed regulations on municipalities owning and/ or operating large or medium MS4s. All the cases cited by Petitioners are inapplicable to this situation27.

Petitioners claim is without merit and must be rejected.

J. THE REGIONAL BOARD ACTION DOES NOT VIOLATE THE CALIFORNIA ADMINISTRATIVE PROCEDURES ACT

Petitioners argue that the SUSMP requirements constitute rulemaking, in violation of the California Administrative Procedure Act, Government Code Section 11340 *et.seq*. Petitioners' argument is grossly incorrect. The APA requirements apply only to rulemaking activities. Contrary to the Petitioners' assertion, the action is not "rulemaking" in nature. Rather, it is the identification of further requirements set forth in the Los Angeles County MS4 permit. Under the APA itself, the issuance of such permits is not subject to the rulemaking requirements of the APA (Government Code Section 11352(b).

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27 *County of Fresno v. State,* (1991) 53 Cal. App. 3d 482 involved a facial constitutional challenge by the County of Fresno to a statute establishing minimum statewide standards for business and area plans relating to the handling and release or threatened release of hazardous materials and requiring local governments to implement its provisions. The Court found that a program was not a reimbursable state-mandated program under Govt. Code § 17556 (d) "if the agency has the authority to levy a charge or fee sufficient to pay for the program." Id. at 484. The court found that Article XIII B applies to taxation and "was not intended to reach beyond taxations." Id. 487. *Hayes v. Commission on State Mandates*, (1992) 11 Cal.App.4th 1564 addressed the exception set forth in Gov. Code § 17556(c). This case involved a decade long battle over claims by two county superintendents of schools for reimbursement for mandated special education programs. The court stated that the "costs mandated by the federal government are exempt from an agency's taxing and spending limits," and therefore exempt from reimbursement. Id. at 1580.

K. THE REGIONAL BOARD ACTION IS STATUTORILY EXEMPT FROM THE PROVISIONS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

Petitioners' claim that the Regional Board is required to review potential significant environmental impacts before approving SUSMP requirements. The issuance of the LA County MS4 permit itself, and the requirements contained in the permit, is exempt from CEQA (Water Code Section 13389). Accordingly, no specific CEQA documentation has been prepared for this action. Nonetheless, Regional Board staff prepared preliminary cost-benefit analyses contained in the supporting material and these have been made part of the Administrative Record (A.R. Vol. 09)

VI. CONCLUSION

The SUSMP requirements approved by the California Regional Water Quality Board are necessary and authorized by state and federal statute. The Regional Board has the authority to require conditions to control storm water pollution from new development and redevelopment. The Regional Board action does not constitute a "regulation" requiring its filing before the Office of Administrative law. The Regional Board is accorded considerable deference to its determination that the SUSMP requirements will "reduce pollutants in storm water to the maximum extent practicable". The evidence supports the findings. All the terms of the SUSMP requirements are authorized under the Clean Water Act and State statutes. The Regional Board action does not impose unfunded mandates.

A review of the substance of the allegations in this Petition, rather than the hyperbole, as to the actual requirements of state and federal law reveals that the Regional Board acted based on the evidence presented before it and the rule of law.

Therefore, the Regional Board and the Regional Board Executive Officer respectfully ask the State Board to find Petitioners claim invalid, reject the request for a stay of the requirements, and deny the Petition

R0072573

June 6/7 2000

Legal Issues



Jorge Leon, Senior Staff Counsel

The Administrative Review Process of Order 96-054



- The Regional Board created the Administrative Review Process.
- The Administrative Review Process sets forth a procedure "for review and acceptance of reports and documents submitted to the Regional Board" and a method "to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action."

The Administrative Review Process of Order 96-054

- The Administrative Review Process does not deprive the Regional Board of authority to adopt the SUSMP for these reasons:

  1. The Administrative Review Process was rendered obsolete and suspended by:

     - The July, 1999 deadline for implementation passed;
     - In April, 1999 and again in September, 1999, the Regional Board directed the Executive Officer to bring a SUSMP proposal for its consideration;

The Administrative Review Process of Order 96-054

2. Development v. Compliance: The Administrative Review Process applies to Compliance and Enforcement, not development of the SUSMP

3. If the Administrative Review Process were deemed to apply, there has been substantial compliance with the process

   - Submittal of proposal and public review
   - Executive Officer Response
   - Meet and Confer
   - Executive Officer Acceptance or Rejection

4. Finally, acceptance of Petitioner's position would lead to an unintended, unending process.

The Regional Board exercised proper authority under both federal and state law

- Regional Board may "require controls to reduce the discharge of pollutants ..and such other provisions ..determines appropriate." [33 U.S.C. 342(p)(B)(iii)]
- EPA's Interim Permitting Policy authorizes "more specific conditions or limitations to be incorporated into storm water permits as necessary and appropriate" [61 Fed. Register 43761]
- Administering agency accorded high degree of deference in areas of law they regulate.

  [Chevron v. NRDC (1984) 467 U.S. 837]

Changes to the SUSMP at the January 26, 2000 Public Hearing

- The changes made by the Board to the proposal presented by staff were based on parties' comments, staff recommendations and Board Member concerns.

- The changes were a "logical outgrowth" of previous SUSMP versions and staff discussions with the parties. The Petitioners' rights to due process and adequate notice were protected.

Changes to the SUSMP at the January 26, 2000 Public Hearing

- The Changes:
  - Applicability of the SUSMP:
    - The SUSMP requirements apply to all projects in the nine enumerated categories for the LA County MS4 Program. While some development planning/construction requirements in the permit are made applicable only to "discretionary projects", this limitation does not cover the seven "enumerated project categories" in Order No. 96-054, and the two additionally designated "enumerated project categories" by the Executive Officer and affirmed by the Regional Board.

Changes to the SUSMP at the January 26, 2000 Public Hearing

- The Changes:
  - Applicability to Categories for the City of Long Beach:
    - A statement was added to clarify that the SUSMP requirements adopted by the Regional Board apply to the City of Long Beach for (I) 10-99 home subdivisions; (ii) 100 or more home subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Program

Changes to the SUSMP at the January 26, 2000 Public Hearing

- The Changes:
  - Effective Date of SUSMP Requirements: A statement was included to provide Permittees 6 months from the date of Executive Officer approval of the SUSMP to amend ordinances and codes to be consistent with the adopted SUSMP requirements, and thence 30 days thereafter for the requirements to take effect.
  - Definition of Commercial Development: The Definition of "Commercial Development" was revised to include all developments that are not considered "residential" or "heavy industrial" based on the categorization of the federal storm water regulations.

Changes to the SUSMP at the January 26, 2000 Public Hearing

- The Changes:
  - Definition of Environmentally Sensitive Areas:

    A new "Table 3" was added to the SUSMP to list areas presently covered under the definition of "environmentally sensitive areas" based on readily ascertainable designations by the State Board, the California Resources Agency, and the County of Los Angeles.
  - Roofing Surface Area Exclusion from Mitigation Standard:

    The roofing surface credit for calculation of storm water runoff volume for mitigation was eliminated.

Changes to the SUSMP at the January 26, 2000 Public Hearing

- The Changes:
  - Limited Exclusion for Small Restaurants from Mitigation Standard:

    The language was revised to exempt restaurants of less than 5,000 square feet from the requirement to mitigate storm water.
  - Waiver Provision:

    The language was revised to recognize proximity to an unconfined water table as one basis for granting of a waiver.

    A sentence was added to require that all other BMPs be considered and rejected before a waiver from the numerical mitigation standard is granted.

    A statement was added to require that non-enumerated bases for waiver be brought to the Regional Board for consideration.

Changes to the SUSMP at the January 26, 2000 Public Hearing

- The Changes:
  - Effective Date of SUSMP Requirements:

    A statement was included to provide Permittees 6 months from the date of Executive Officer approval of the SUSMP to amend ordinances and codes to be consistent with the adopted SUSMP requirements, and thence 30 days thereafter for the requirements to take effect.
  - Definition of Commercial Development:

    The Definition of "Commercial Development" was revised to include all developments that are not considered "residential" or "heavy industrial" based on the categorization of the federal storm water regulations.

The SUSMP is not a Regulation

- The Administrative Procedure Act (Government Code Section 11340, et seq.) requires compliance with certain procedural steps which culminate in consideration for approval of an agency action by the Office of Administrative Law.
- The issuance of permits by the Regional Boards is specifically exempted from that process by Government Code Section 11352(b).
- The SUSMP is a part of Permit Order No. 96-054, and therefore exempt from APA.

The SUSMP is not an Unfunded Mandate

- "Unfunded Mandate" provisions of the State Constitution provision does not cover permits issued imposing federal requirements
- The SUSMP, like the Permit, imposes federal requirements
- Government Code Section 17556 (c) Exemption

The Regional Board has ample authority to adopt the SUSMP

- The Regional Board was authorized to adopt the numerical design standard.

The Regional Board adopted the SUSMP in conformance with applicable administrative procedures

- The adoption process included legally adequate notice and opportunity for comment.
- Board heard testimony from some 25 speakers on September 16, 1999
- The Board heard testimony for an entire hearing day on January 26, 2000
- Changes made on January 26 were "logical outgrowth" of the noticed SUSMP Proposal.

Adoption of the SUSMP is the not the subject of CEQA compliance

- The SUSMP is a requirement of Permit No. 96-054. It is part of the permit.
- Since permit issuance is exempt from CEQA (Water Code Section 13389) so is the SUSMP.
- Timing: Regional Board could have adopted the Permit and SUSMP in the same proceeding at the same time, obviating the CEQA argument.

The SUSMP adoption process was not unscientific or arbitrary

- Technically defensible
- Based on local data and nationally accepted methods
- Criteria in use by other states and communities range from 0.5 to 2 inches
  (FL, WA, MD, VA, CO)
- Similar criteria in use by Santa Monica, Calabasas, Ventura County, and unincorporated LA County
- A lengthy administrative record that supports the action
- The Board and staff had the benefit of many studies and reports and several workshops and Board hearings

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The SUSMP does not run afoul of CWC Section 13360

- CWC Section 13360 provides that "No waste discharge requirement or other order…shall specify the design location, type of construction, or particular manner in which compliance may be had with that requirement, order"
- The SUSMP does not so specify
- Order No. 99-03 provides many BMPs from which Petitioners can choose to comply
- Up to Petitioners to select compliance method

CONCLUSION: The Regional Board's action to approve the SUSMP was appropriate

- Petitioners' procedural arguments do no more than elevate form over substance and should be rejected.
- Petitioners' substantive arguments lack legal support and should be rejected
- The Regional Board acted with full authority under the California Water Code and the Clean Water Act to craft a SUSMP that protects water quality.
- The Regional Board's adoption was made necessary by the Petitioner's failure to act.

June 6/7 2000

SCRIPT FOR HEARING

THANK YOU DENNIS

DISTINGUISHED MEMBERS OF THE STATE BOARD. I WILL BE PRESENTING (I) THE TECHNICAL AND SCIENTIFIC RATIONALE FOR THE NUMERICAL DESIGN CRITERIA; (III) COMPARE THE CRITERIA FOR LOS ANGELES WITH THOSE OF SISTER JURISDICTIONS; (II) EXPLAIN HOW IT MIGHT BE APPLIED TO A PARTICULAR PROJECT; (IV) DISCUSS COST ANALYSIS CONDUCTED BY STAFF; (V) DESCRIBE POTENTIAL COST SAVINGS FROM INNOVATIVE PROJECT DESIGNS; AND (VI) SUM UP WITH THE EXPERIENCE OF OTHER STATES IN IMPELMENTING DESIGN CRITERIA FOR NEW DEVELOPMENT AND REDEVELOPMENT PROJECTS.

THE SELECTION OF THE WATER QUALITY DESIGN STORM FOR THE LA REGION IS BASED ON THE APPROACH RECOMMENDED BY THE ASCE AND WEF IN THEIR MANUAL OF PRACTICE. THE METHOD IS A MODIFICATION OF THE RATIONALE METHOD IN HYDROLOGY AND UTILIZES THE IDEA THAT THERE IS A CERTAIN VOLUME OF WATER THAT CAN BE CAPTURED OR TREATED BASED ON THE NATURE OF PRECIPITATION. SMALL RAINFALL EVENTS ARE COMMON WHILE EXTREME FLOOD EVENTS ARE RARE. YOU HAVE ON SCREEN THE EMPERICAL EQUATION THAT RELATES THE EFFICIENT TREATMENT VOLUME TO A DESIRED PERCENT TREATMENT COEEFICIENT MULTIPLIED BY THE RUNOFF COOEFICIENT MULTIPLIED BY THE MEAN PRECIPITATION VOLUME. THIS TRANSLATES TO IN COASTAL CALIFORNIA TO A RUNOFF INCH OF 0.12 – 0.86. IN HIGHLY PAVED AREAS LIKE LA, THE VALUE IS AT THE HIGHER END. FOR LESS URBANIZED AREAS THE VALUE WILL BE LOWER.

THE REGIONAL BOARD ADOPTED 4 EQUIVALENT NUMEREICAL DESIGN STANDARDS (OR MITIGATION CRITERIA) FOR NEW DEVELOPMENT AND REDEVELOPMETN PROJECTS, THE WEF/ASCE METHOD IS THE PRIMARY METHOD AND DIRECTLY DETERMINES THE EFFICIENT INCH OF RUNOFF THAT CAN BE TREATED FOR WATER QUALITY PURPOSES. THE SECOND METHOD IS SIMILAR AND IS DESCRIBED IN THE CA BMP HANDBOOK. IT USES THE ANNUAL RUNOFF VOLUME CAPTURE METHOD TO CALCULATE THE VOLUME OF RUNOFF THAT IS TO BE TREATED. THE THIRD AND FOURTH METHODS ARE ESSENTIALLY THE SAME. THE 0.75-INCH RAINFALL CRITERION IS A MORE SPECIFIC STATEMENT OF THE 85TH PERCENTILE RAINFALL VALUE AND USES THE PRINCIPLE OF DIMINSHING RETURNS.

AS I INDICATED BEFORE, SMALLER RAINFALL EVENTS ARE MORE COMMON THAN FLOOD CAUSING EXTREME RAINFALL EVENTS. THE GRAPH BEFORE YOU - ON THE VERTICAL AXIS IS CUMULATIVE RAINFALL

VOLUME IN INCHES. ON THE HORIZONTAL AXIS IS RAINFALL IN INCHES PER 24 HOUR. THE LARGEST VOLUMES OF WATER ARE PRODUCED BY RAINFALL EVENTS THAT ARE LESS THAN I INCH. . THIS DATA COMES FROM THE 50-YEAR RAINFALL RECORDS FOR THE LAX AREA.

THIS GRAPH SHOWS THE 0.75-INCH DERIVATION OF THE NUMERICAL DESIGN STANDARD FOR LOS ANGELES. ON THE VERTICAL AXIS YOU HAVE CUMULATIVE PROBABILITY OF RAINFALL EVENT. ON THE HORIZONTAL AXIS ARE THE 24-HOUR RAINFALL IN INCHES. ANY PARTICULAR POINT ON THE CURVE WOULD INDICATE THE PROBABILITY OF RAINFALL EQUAL TO A LESS THAN THE AMOUNT AT THE POINT OF INTERSECTION. THUS, THE PROBABILITY OF OCCURANCE OF A RAINFALL EVENT EQUAL TO OR LESS THAN 0.75 INCH IS ABOUT 85 PERCENT. THE 85 PERCENTILE IS THE MID POINT OF THE KNEE OF THE CURVE. THE TOP OF THE KNEE IS INDICATIVE OF THE POINT OF DIMINISHING RETURNS. THE DATA WAS OBTAINED FROM HUNDRED YEAR RECORDS FOR THE DOWNTOWN CIVIC CENTER STATION, WHICH IS THE REPRESENTATIVE STATION SELECTED BY LA COUNTY DEPARTMENT OF PUBLIC WORKS.

THE NEXT GRAPH IS SIMILAR TO THE PREVIOUS. IT IS PRESENTED TO ILLUSTRATE THE POINT THAT THE 85TH PERCENTILE VALUE WOULD BE HIGHER FOR COASTAL AREAS IN LA. IN THIS CASE 1.2 INCHES FOR WEST LA. THE VALUE CHOSEN FOR THE REGION IS THUS THE AVERAGE. CITIES IN A WATERSHED CAN ELECT A DIFFERENT VALUE SO LONG AS THEY USE ANY ONE OF THE METHODS. "IT IS NOT ONE SIZE FITS ALL."

MY NEXT SLIDE COMPARES THE WQ DESIGN STANDARDS AND OTHER CRITERIA FOR NEW DEVELOPMENT AND REDEVELOPMENT THRESHOLDS FOR LA WITH THOSE OF THE STATES OF WASHINGTON, FLORIDA, AND MARYLAND. THESE STATES HAVE SOME YEARS OF EXPERIENCE BEHIND THEM. IN GENERAL THE WQ DESIGN CRITERIA AND OTHER THRESHOLDS FOR THE LA REGION ARE LOWER – OUR RAINFALL CRITERIA IS 0.75 WHEN COMPARED WITH 1.3 INCHES FOR WA. OUR PERCENTILE RAINFALL CRITERIA IS 85TH PERCENTILE RATHER THAN THE 90TH FOR THESE STATES. THE REDEVELOPMENT THRESHOLD FOR LA IS 5000 SQ. FT. AS WHEN COMAPRED TO FLORIDA'S 4000 SQ. FT. WE HAVE NOT ADOPTED PERFORMANCE STANDARDS, AND OUR REQUIREMENTS APPLY TO NINE ENUMERATED CATEGORIES RATHER THAN ALL DEVELOPMENT CATEGORIES THAT MEET THE MINIMUM THRESHOLD.

HOW WOULD APPLICATION OF THE CRITERIA PROCEED IN THE REAL WORLD. WE EXPECT THAT DEVELOPER WILL PREPARE A PLAN. THE PLAN WOULD CONTAIN SOURCE CONTROL BMPs AND STRUCTURAL BMPs SUCH AS A SHED. THE PLAN WOULD ALSO IDENTIFY A SET OF TREATMENT CONTROL BMPs SIZED TO MITIGATE RUNOFF FROM 0.75 INCH OF RAINFALL FROM THE DEVELOPMENT. MITIGATION MEANS INFILTRATION,

TREATMENT OR CAPTURE. THE SELECTION OF BMPs IS LEFT TO THE DEVELOPER OR THE MUNICIPALITY MAY PRESCRIBE.

THE NEXT SLIDE LISTS BMPs THAT ONE MIGHT CHOOSE TO SATISFY THE SUSMP REQUIREMENTS FOR TREATMENT CONTROL BMPs – A SWALE ALONG THE PARKWAY, DETENTION BASIN INTEGRATED INTO THE DEVELOPMENT AS A LAKE; CATCH-BASIN BASKETS FOR TRASH...AND SO ON.

THE IMPLEMENTATION OF A FEDERAL REGULATION BY THE REGIONAL BOARD DOES NOT REQUIRE THAT A SEPARATE COST ANALYSIS BE CONDUCTED. NEVERTHELESS STAFF WORKED WITH THE CITY OF LA TO DETERMINE COSTS ASSOCIATED WITH THE RULE FOR A PROJECT IN THE PIPELINE – A FIVE ACRE $ 6.5 MILLION COMMERCIAL DEVELOPMENT IN DOWNTOWN LA. REFERENCES FOR TASK COSTS ARE CALCULATIONS ARE INCLUDED WITH THE ADMINISTRATIVE RECORD AND WITH OUR EVIDENCE AND EXHIBIT SUPPLEMENT. THE MITIGATION COST TO SIZE A DETENTION BASIN BASED ON THE NUMERICAL STANDARD WORKS OUT TO LESS THAN 1 PERCENT OF THE PROJECT COST.

IN THE SECOND EXAMPLE WE EVALUATED COSTS FOR NON CAPTURE BMPs SUCH AS AN INFILTRATION TRENCH AND VEGETATED SWALES. AGAIN COSTS INCLUDING DESIGN, CONSTRUCTION, MAINTENANCE AMOUNTED TO LESS THAN 1 PERCENT OF THE PROJECT COST. IT IS GENERALLY ACCEPTED THAT ABOUT 5 PERCENT OF THE PROJECT COST IS REASONABLE FOR WQ MITIGATION.

DESIGN CRITERIA FOR STORM WATER IS NOT NEW. THE NEXT GRAPH COMPARES THE RELATIVE COST ON THE BASIS OF THE RAINFALL INCH TO BE CAPTURED OR TREATED. FROM RIGHT TO LEFT – FLOOD CONTROL CRITERIA [100 YEAR]; CAFO'S [25 YEAR]; SEDIMENT CAPTURE DURING CONSTRUCTION [10 YEAR]; WQ DESIGN CRITERIA FOR COASTAL WASHINGTON STATE [6 MONTH]; AND THE 0.75 INCH FOR LA. LOOKING AT THE GRAPH, THE RELATIVE COST FOR A DETENTION BASIN FOR WQ IN COASTAL WA IS ALMOST 70 PERCENT MORE THAN LA. A FLOOD CONTROL BASIN IN LA WOULD HAVE REQUIRED EXPENDITURES 8 X AS MUCH. IN SHORT THE COST OF COMPLYING WITH WQ DESIGN STANDARD IS REASONABLE.

WEF DESIGN STANDARD

The Design Storm

$$P_o = a.C.P_A$$

P_o - Maximized water quality "treatment" volume

a - "Treatment" volume coefficient

C - Area runoff coefficient

P_A - Mean storm precipitation volume

Ref: Urban Runoff Quality Management, WEF Manual of Practice No. 23 and ASCE Manual and Report on Engineering Practice No. 87 (1998)

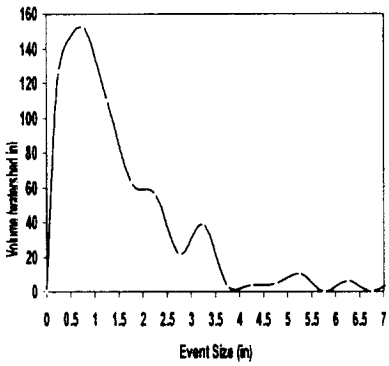
Range in coastal CA for 85% annual runoff "treatment" 0.12 - 0.86 inch

NUMERICAL STORM WATER MITIGATION STANDARD

Four different and equivalent volumetric methods to determine BMP sizing criteria

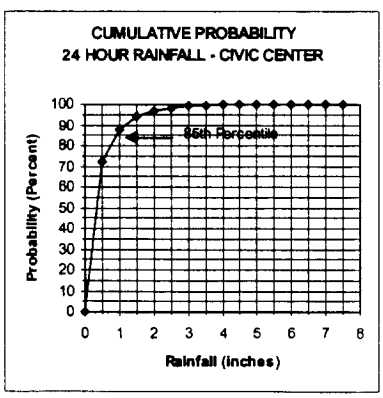
- Maximized volume capture (ASCE Method)
- Percent volume treatment (CA Handbook)
- All events up to 0.75 inch 24-hr precipitation
- Historical record 85th percentile rainfall event

SCIENTIFIC CONCEPT



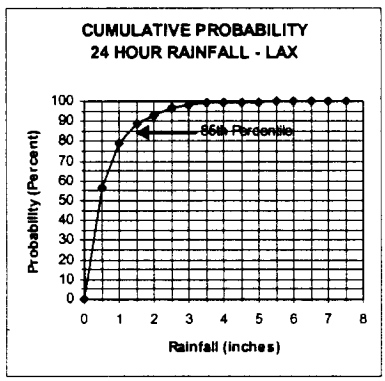
- Largest volumes of runoff are produced by smaller storms
- Criteria promotes BMP application to smaller more frequent storms

TECHNICAL ANALYSIS



- 85th Percentile 24 hour rainfall event (0.75 inch)
- Representative rainfall station for Los Angeles County
- 100 + Years Records

TECHNICAL ANALYSIS



- 85th Percentile 24 hour rainfall event (1.2 inch)
- Rainfall station representative for Coastal Los Angeles County
- 50 + Years Records

COMPARISON WITH CRITERIA IN OTHER STATES

	MARYLAND	FLORIDA	WASHINGTON	Los Angeles
Design Criteria (Rainfall)	1 inch	1 inch	1.3 inch	0.75 inch
Design Criteria (Percentile)	90th	>90th	>90th	85th
Development Threshold Criteria	5000 sq. ft.	4000 sq ft	5000 sq. ft.	5000 sq. ft
Performance Standard	80% TSS and 40 % P Removal (Proposed)	80% TSS Removal	% TSS Removal (Proposed)	None
Development Categories	All	All	All	Nine
Year Implemented	1982	1979	1992	2000

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CRITERIA APPLICATION

Example - 100+ Home Sub-division

- Select source control and structural BMPs from guidance in SUSMP
- Select a set of treatment control BMPs from guidance to affect pollutants in total runoff from the first 0.75 inch of rainfall.

(Note: No Specific BMP or BMP Efficiency is prescribed)

- Size BMPs for respective drainage area
- Submit Plan to municipality for approval.

CRITERIA APPLICATION

- Hypothetical Treatment Control BMPs to select from:
  - Swale (along parkway)
  - Infiltration basin (at end of swale)
  - Biofilters (around parking lot)
  - Greenbelt (between rear yards)
  - Detention basin (as a lake)
  - Catch-basin baskets (for trash)

(Note: BMPs are from menu already approved by Board April 1999)

BMP COST

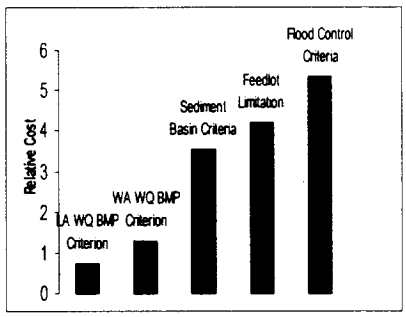
- Five Acre Commercial Development
  - Project Cost is $6.5 million
  - Detention Basin BMP (Example 1)
    - Excavation and Haul away = $12,870
    - Land Cost = $28,800
    - Maintenance (1 / year cleanout) = $33
    - Total Cost = About $42,000
  - Mitigation Percent Cost = 0.6 %

BMP COST

- Infiltration Trench and Vegetated Swale BMPs (Example 2)
  - Trench with Gravel = $13,500
  - Land Cost = Minimal
  - Maintenance (5 yr replacement) = $1350 per yr
  - Swale = $4050
  - Land Cost / Maintenance = Within Landscaping
  - Combined Cost = About $19,000

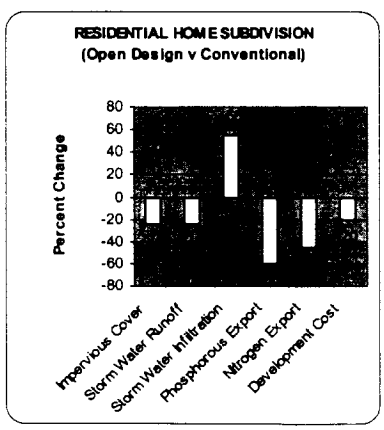
  Mitigation Percent Cost = 0.3 %

RELATIVE COST COMPARISON



- Relative cost much less than similar storm water criteria.
- Comparable criteria for wet regions, e.g., Pacific Northwest is higher.

COST BENEFIT EFFECTIVENESS OF DESIGN CRITERIA

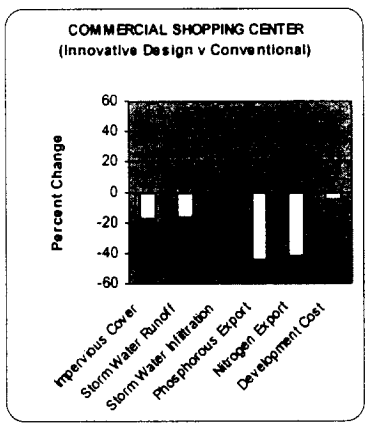


Open Space Design

- increased natural area conservation
- reduced surface runoff by 25 percent
- reduced pollutant export by 40 to 50 percent
- development cost reduced by 12 percent

Source: Watershed Protection Techniques Vol.. 3, "Better Site Design" (2000)

COST BENEFIT EFFECTIVENESS OF DESIGN CRITERIA



Innovative Design

- reduced impervious cover
- reduced surface runoff by 17 percent
- reduced pollutant export by 40 to 45 percent
- development cost slightly lower than conventional design

Source: Watershed Protection Techniques Vol.. 3, "Better Site Design" (2000)

THE EXPERIENCE OF OTHER STATES

Do the design standards impose undue burden and unsupportable costs?

"Complying with the Florida rule...does not impose undue burdens"
- E. Livingston, FL Department of Environmental Protection.

"In the beginning...(circa 1982) the design standards were very burdensome ... [startup costs]. Currently....routine"
- B. Clevenger, MD Department of the Environment

"Substantial costs to implementing storm water controls...but .. [costs] are incremental to existing development and permit review costs"
- E. O'Brien, WA Department of Ecology

THE EXPERIENCE OF OTHER STATES

Have there been noticeable improvements to water quality?

"[Undoubtedly] implementation...has greatly reduced the effects of growth....[M]ajor reason why the state has so few ...impaired water[s].
- E. Livingston, FL Department of Environmental Protection.

"Modest water quality improvement [limited compliance because of poor interpretation]. Expected to change dramatically with our new Manual"
- B. Clevenger, MD Department of the Environment

"[H]ave not been monitoring specifically. ...[some] anecdotal evidence"
- E. O'Brien, WA Department of Ecology

California Regional Water Quality Control Board
Los Angeles Region

Winston H. Hickox
Secretary for
Environmental
Protection

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640
Internet Address: http://www.swrcb.ca.gov/~rwqcb4

Gray Davis
Governor

July 7, 2000

Ms. Elizabeth Jennings
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
P. O. Box 100
Sacramento, CA 995812-0100

Dear Ms. Jennings:

POST-HEARING BRIEF – IN RE: THE CITIES OF BELLFLOWER, ET AL., CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000, ACTION OF THE REGIONAL BOARD AND IT EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICIPAL STORM WATER AND URBAN RUNOFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES NO. CAS614001]). [SWRCB/OCC FILES A-1280, A-1280(a) AND A-1280 (b)]

Please find enclosed our post-hearing brief. This is in response to the State Board letter, dated June 12, 2000, requesting us to address four specific questions.

If you have any questions or need more information, please call me at (213) 576 – 6605 or Dr. Xavier Swamikannu at (213) 576 – 6754, or Regional Board Counsel, Jorge Leon at (916) 657-2428.

Sincerely,

Dennis A. Dickerson
Executive Officer

Enclosure

cc: Jorge Leon, OCC, State Water Resources Control Board
Bruce Fujimoto, State Water Resources Control Board
Richard Montivedo, Esq., Rutan & Tucker
Stephen P. Deitsch, Esq., Mayer, Brown & Platt
Lyman C. Welch, Esq., Best, Best, & Krieger
David Beckman / Alex Helperin, Natural Resources Defense Council
Steven Fleischli, Santa Monica Bay Keeper
Heather Hoecherl/ Mark Gold, Heal the Bay
Interested Persons Mailing List (Letter only)

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BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BURBANK, CERRITOS, COMMERCE, DIAMOND BAR, DOWNEY, IRWINDALE, LA-CANADA FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, PALOS VERDES ESTATES, PICO RIVERA, POMONA, RANCHO PALOS VERDES, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, et al., municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, AND THE CITY OF ARCADIA, a municipal corporation AND WESTERN STATES PETROLEUM ASSOCIATION , a Trade Association Petitioners, v. CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, and DENNIS DICKERSON, Executive Officer, Los Angeles Regional Water Quality Control Board. Respondents,	File Nos.: A-1280; A-1280(a); A-1280 (b) **POST-HEARING BRIEF** **July 7, 2000**

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INTRODUCTION

The State Board conducted a two-day hearing in the matter on June 7 and June 8. The State Board, in a letter dated June 12, requested the parties to the Petition to submit a Post-hearing Brief addressing four questions by July 7. The Los Angeles Regional Board's response follows.

RESPONSE TO QUESTIONS

I. If There Is To Be A Numeric Design Standard For Infiltration Or Treatment, Is The 0.75-Inch Standard Appropriate? Should It Be Substituted With A Different Numeric Standard, Including Potentially Different Numbers for Different Areas? If There Were A Range Of Numbers How Would They Be Implemented?

A. Numerical Design Criteria and Storm Water Quality

A numeric design standard is the most elementary criterion necessary to ensure that post construction BMPs for new development and significant redevelopment are sized to reduce pollutants in storm water runoff to the statutory standard of MEP. The next step would be to relate treatment or infiltration volume to pollutant removal capabilities based on a technology or performance standard. As presented in the Regional Board's oral testimony on June 8, other jurisdictions have already taken this step by establishing performance standards for total suspended solids, zinc, nitrogen and phosphorous[1]. The third step would be to relate the BMP performance standard to receiving water objectives and beneficial uses. For example, the Province of Ontario, Canada, specifies total suspended solids removal standards based on fish habitat protection guidelines.[2] The Los Angeles Regional Board's action is at best a first step.

B. The 0.75 Inch And the Other Three Numeric Design Criteria are Appropriate

From a regulator's view point, the ideal numerical criteria to ensure that the MEP standard is met for storm water discharges should have the following characteristics. The criteria

[1] See Slide No. 6 of Dr. Swamikannu's presentation and the Transcript of the June 7 Hearing. Refer also to Statements of Policy provided by Maryland, Washington and Florida contained in the record for the Hearing.

[2] See, *Best Practice Environmental Guidelines for Urban Stormwater*, Cooperative Research Center for Catchment Hydrology. Melbourne, Australia (1997). The document includes a comprehensive review of criteria for storm water treatment including methods in North America.

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must be, (i) simple to use, (ii) practical and cost effective, (iii) prescriptive, (iv) flexible, and (v) scientific and technically defensible. [3] The criteria must also encourage innovation.

The Regional Board's four methods to determine the appropriate water quality design criteria for post-construction BMPs, including the 0.75-inch rainfall treatment criterion, are simple to use. They are cost-effective because the volume of rainfall or runoff to be treated is based on the water quality efficient (maximized) volume or precipitation event. The methods are also prescriptive and thus easy to follow in contrast to the Petitioners empty alternative.[4] Three of the four design criteria provide the opportunity for site flexibility. All four design criteria produce values for storm water treatment that are similar (not surprising because the Los Angeles area is highly paved).[5] Finally, the Regional Board has soundly documented and justified the technical and scientific basis for the numerical water quality design criteria in the record and in oral testimony before the State Board.[6] In addition, the choice of design standards presented will promote BMP design innovation.

C. The Numeric Design Criteria – Different Numbers For Different Areas

The numerical criteria provided by the Regional Board already provides Petitioners the opportunity to account for differences in site conditions such as rainfall patterns and percent surface area imperviousness. In fact, the ASCE Method (maximized volume treatment) and the California Handbook Method (annual percent volume treatment) both calculate the runoff volume (a direct measure) to be treated to remove pollutants rather than rainfall volume (an indirect measure). Thus, if an MS4 Permittee wants to use an area sensitive method, all the permittee needs to do is select either one of these methods and obtain a site-specific or area specific value (greater than or less than the 0.75-inch design standard). The claim made by Petitioners that the design criterion is "one size fits all" is ingenuous, because only the 0.75-inch standard is numerically prescriptive. The rationale to listing the 0.75-inch standard is to provide the simplest choice of criterion that is also readily understandable. A single determinate value promotes countywide certainty and consistency for the development community. However, the 0.75-inch standard is not the sole BMP design criterion provided by the Regional Board. Three other

[3] Some of these factors must be balanced against each other. For e.g., the simpler an approach the less rigorously scientific it is.
[4] Permittees did propose a 0.6-inch design criteria in an early draft. However, admittedly that the number was selected arbitrarily.
[5] See Regional Board's calculations for the required retention basin volume using the four methods. The values are within ten percent of one another. AR 9(18)
[6] See the Record of Decision and Staff Report at 2 [AR 2(2)] and Dr. Swamikannu's June 8 testimony Slides 1 – 5 for the scientific basis; AR 14(3) for the mathematical calculations; and our May 5 Response in Opposition to Petition at 31 for a legal analysis.

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derivative design criteria based on long-term precipitation records or rainfall runoff patterns are also provided.

D. Numerical Design Criteria Implemented As a Range of Numbers

As discussed earlier, three of the four methods for determining the water quality design criteria already allow for the option of area specific numerical values that are different from the 0.75 inch standard. In theory, the Los Angeles County MS4 program could have at least 86 different design standard values based on the number of municipal jurisdictions. The Los Angeles County MS4 permit allows for such differences, regardless of the merits of having so many numbers, which might be a compliance nightmare for the development community.[7] A SUSMP that differs from the Regional Board approved SUSMP only by a numerical value that is different than the 0.75 inch, but derived using one of the other three accepted design criteria methods, would be ruled not only as being substantially similar but also of being functionally identical. If an MS4 Permittee uses this option, the Regional Board will review the calculations and accept the functionally identical design numerical value for inclusion in guidelines and in technical manuals.

II. What Types Of Redevelopment Or Remodeling Projects Should Be Included Within The Mitigation Requirements?

A. Significance of Redevelopment and Remodeling

Petitioners have argued that the current definition of "redevelopment" is confusing and may be too broad and burdensome if literally applied.[8] They claim that a single-family homeowner making interior remodeling changes or replacing a roof would be required to install treatment control BMPs. The Regional Board did not intend for the rule to apply to internal remodeling projects or limited external work such as roof replacements. The current definition of "redevelopment" in the SUSMP, is largely a result of the Regional Board's efforts to incorporate clarifying text proposed by Permittees.[9]

In order to determine which categories of redevelopment or remodeling projects should be subject to the SUSMP requirements, the Regional Board reviewed the rule implementation in other leading jurisdictions. Washington, Maryland and Florida apply the requirement to control

[7] Board Order No. 96-054 at 34. "develop a program on planning control measures consistent with [SUSMP]....[S]hall initiate implementation....following approval of the model [SUSMP]"

[8] The source of the definition is the "State of Washington, Vol. 1 – Minimum Technical Requirements", May 31 Evidence and Exhibit Supplement at 20.

[9] See comment letters from the Executive Advisory Committee [AR 6(10)] Los Angeles County [AR 2(16)]. Permittees recommended that the definition include the phrase "the addition, to an already developed site, of 50 percent or more impervious area or improvements to 50 percent or more of the existing improvements on site".

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storm water pollution from redevelopment projects to all categories of urban development based on a minimum threshold of impervious area addition, not just specific types of development.[10] After all, when the pollutants created by urbanization have the potential to adversely impact receiving waters, restricting the application of the rule to too few project categories might defeat the important objective of reversing the adverse impacts of past urban development practices. The application of SUSMP requirements to redevelopment projects offers the singular opportunity to regulators, not only to hold the line on water pollution from storm water discharges, but also to cost effectively reverse the adverse impacts on water quality of past urbanization.

B. Definition of Redevelopment

The Regional Board proposes the following definition of "redevelopment"' to clear up any ambiguity of the kind suggested by Petitioners. "Redevelopment" means:

"On an already developed site, the creation or addition of 5,000 square feet or more of impervious surfaces. If the creation or addition of impervious surfaces is fifty percent or more than the existing impervious surface area, then storm water runoff from the entire area (existing and additions) must be considered for purposes of storm water mitigation. If the creation or addition is less than fifty percent of the existing impervious area, then storm water runoff from only the addition area needs mitigation. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces".

C. Types of Redevelopment Projects to Be Included

The Los Angeles Regional Board's application of SUSMP requirements to redevelopment projects is limited in scope, unlike the other leading jurisdictions. It applies to only nine specific categories of redevelopment projects[11] and only as follows: for, (a) exterior surfaces or foundation, removal and replacement which results in the creation or addition of 5,000 square feet or more of impervious surfaces (except projects in environmentally sensitive areas where the creation or addition must exceed 1,250 square feet),[12] and (b) other impervious

[10] See statements of policy submitted by, E. Livingston, Florida Department of Environmental Protection (May 31, 2000) at p 2; E. O'Brien, Washington Department of Ecology (May 25, 2000) at p 4; and B. Clevanger, Maryland Department of the Environment (May 31, 2000) at 5, May 31 Evidence and Exhibit Supplement

[11] See Standard Urban Storm Water Mitigation Plan at 3. AR 14(1).

[12] See *Infra* at 25 for CEQA rule on redevelopment threshold

surfaces, the removal down to bare soil or base course and replacement, which results in the creation or addition of 5,000 square feet or more of impervious surfaces (except projects in environmentally sensitive areas where the creation or addition must exceed 1,250 square feet).

III. Should Location Such As Environmentally Sensitive Areas Be A Factor in Determining the Application of the SUSMP? If So, What Specific Types Of Projects Should Be Included?

A. The Significance of Location

The location of new development and redevelopment projects in "environmentally sensitive areas" may demand that special requirements be imposed. The purpose of such requirements is to ensure that unique characteristics of project siting be considered in mitigating potential adverse impacts. The USEPA, in discussing storm water controls, notes: "Sensitive area protection is an important element of conservation design...These areas are particularly susceptible to degradation by storm water runoff."[13] There are two main reasons why the application of requirements for new development and redevelopment should apply to projects situated in "environmentally sensitive areas."

First, the geographic location of a development project can impact an ecologically fragile area. A sensitive habitat has a much lower capacity to withstand pollutant shocks than might be acceptable in the general circumstance, and so deserves special attention. The California Public Resources Code (CPRC) § 30240 (b) conditions the siting of developments in areas adjacent to "environmentally sensitive areas" to prevent adverse impacts.[14] Similarly, the California Environmental Quality Act (CEQA)[15] excludes from its categorical rule exemption, those projects situated in "environmentally sensitive areas".[16] In essence, a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant.[17]

Further, the State Board sees fit to designate by the location of discharge 'Areas of Special Biological Significance' (ASBS) to protect natural water conditions and prohibit waste discharges unless the State Board finds that there would be "no adverse impacts to beneficial

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[13] See the USEPA Report "Preliminary Data Summary of Urban Storm Water Best Management Practices" EPA No. 821-R-99-012 (1999) at 5-40.

[14] Public Resources Code § 30240(b) states, "Development in areas adjacent to environmentally sensitive habitat areas shall be sited and designed to prevent impacts which would significantly degrade those areas...."

[15] CEQA is an environmental statute that requires public agencies to fully consider the potential environmental impact of projects prior to approval.

[16] See CPRC § 21000.

[17] 19 CCR 15300.2. This sub-section lists location in an environmentally sensitive area as an exception to categorical exemptions determined by the Secretary for Resources. Categorical exemptions are deemed to not have a significant effect on the environment.

R0072602

uses."[18] The State Board here accepts a shifting of the burden to itself to make the affirmative determination rather than allow permissive action by default because of discharge location.

Examples from other jurisdictions abound. The State of Washington implements a procedural variation of the ASBS, where it requires "a use authorization" for storm water discharges potentially impacting public aquatic lands.[19] Florida imposes more stringent conditions for storm water treatment on new development and redevelopment projects based on the discharge location.[20]

The Los Angeles Regional Board's application of SUSMP requirements to projects in "environmentally sensitive areas" is another basic first step. The rule merely applies requirements based on location rather than imposes more stringent criteria. The consideration by the Regional Board of location of projects for the SUSMP requirements to apply is not new, nor without precedent.

Second, an environmental agency such as the Regional Board has a co-stewardship responsibility, when implementing water quality regulations, to ensure that its actions are in harmony with overlapping environmental mandates for other state and federal resource conservation agencies.[21] The Regional Board, in part, elected to apply SUSMP requirements to projects in environmentally sensitive areas to complement implementation rather than jeopardize or harm the environmental mandates of other State or federal agencies.[22]

B. The Definition of Environmentally Sensitive Areas

The SUSMP cross-references the applicability of SUSMP requirements to "environmentally sensitive area" to designations by other public agencies with designation powers, such as the State Board and the California Resources Agency, not itself. CPRC § 30107.5 defines an "environmentally sensitive area" as: "an area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which would be easily disturbed or degraded by human activities and developments." The SUSMP requirements apply to development and redevelopment projects, which are "located in, discharging directly to, or adjacent to an environmentally sensitive area."

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[18] See California Ocean Plan and Regional Board Basin Plan at 5-1. AR 10(17)

[19] The State of Washington under the use authorization may require, "...application of more stringent requirements that [it] determines are necessary to meet statutory obligations to protect the quality of the state's aquatic lands" See *supra* at 8.

[20] The State of Florida raises the storm water treatment performance standard for new developments to 95% for direct discharges to Outstanding Florida Waters from 85% percent for other waters. Florida, Urban Stormwater Program, Policy Statement and AR. 11(1)

[21] Such agencies include, the California Coastal Commission, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the U.S. National Oceanographic and Administrative Service to name a few.

[22] See Staff Report and Record of Decision at 11 (January 18, 2000) AR 2(2), for a fuller discussion.

R0072603

For the record, the Regional Board proposes to clarify two areas of this definition that may be subject to some ambiguity. These are, (i) the meaning of the phrase "directly adjacent", and (ii) the phrase "directly discharging to." "Directly adjacent" means situated within 200 feet of the contiguous zone required for the continued maintenance, function, and structural stability of the environmentally sensitive area.[23] "Directly discharging to" means outflow from a drainage conveyance system that is composed entirely or predominantly of flows from the subject property, development, subdivision or industrial facility, and not commingled with the flows from adjacent lands.

C. Specific Types of Project to be Included

The SUSMP does not explicitly identify which categories of projects in environmentally sensitive areas are subject to its requirements. The Regional Board's original intent was to provide municipalities with some discretion as to which categories to include or exclude. One may reasonably exempt a few select categories of development based on the rationale that the SUSMP requirements may impose undue burden or that the category of projects have insignificant impact.

Rather than list the types of categories that might be included under the SUSMP requirements, as implied in the question, the Regional Board would support either: (i) the exclusion of a few specific project categories, or (ii) the establishment of a lower threshold than the general rule. The project categories or the threshold may be selected based on the legal principle that statutes [regulations and permit conditions] which are *pari materia* should be read [and interpreted] together and harmonized where possible (*NRDC v. Arcata,* 59 Cal.App. 3d 959(1976)).[24]

We note that CEQA exempts from its requirements projects located in environmentally sensitive areas, if additions to existing structures are less than 2,500 square feet.[25] We propose the following as the determinative threshold for SUSMP requirements to apply in "environmentally sensitive areas" for new development and redevelopment projects irrespective of project category: "for projects in, directly adjacent to, or discharging directly to an environmentally sensitive area, the addition or creation of 2,500 square feet or more of

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[23] For a discussion on minimum dimensions to protect aquatic resources, see, "The Architecture of Stream Buffers", T. Schuler, (1995), Watershed Protection Techniques Vol. 1(4).

[24] The *Arcata* Court ruled that timber harvesting activities regulated by the Forest Practice Act of 1972 were also subject to CEQA, where the Forest Practice Act was silent on the matter, because it involved "Discretionary" action by a public official.

[25] 19 CCR 15301. In part this section categorically exempts from CEQA requirements projects in environmentally sensitive areas if "the addition will not result in an increase in more than, (1) 50 percent of the floor area of the structures before the addition or 2,500 square feet whichever is less;" If the project is not in an environmentally sensitive area, the exemption threshold is 10,000 square feet. CEQA also categorically exempts single family residences, small apartments and duplexes, and small commercial structures developments in areas not designated environmentally sensitive.

R0072604

impervious area. For redevelopment projects, the addition of impervious area must be more than 1,250 square feet."

IV. Should the SUSMP Apply to Both Discretionary Projects and Ministerial Projects? How Should the Term Discretionary Be Defined?

A. Discretionary Projects vs. Ministerial Projects

In CEQA, a "Discretionary Project" is one which requires the exercise of judgement or deliberation when the public agency or body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations. A "Ministerial Project" is a one where a governmental decision involves little or no personal judgement by the public official as to the wisdom or manner of carrying out the project. The public official merely applies the law to the facts as presented but uses no special discretion or judgement in reaching a decision.[26]

B. Interpretation of the Term Discretionary

Petitioners have argued that the application of SUSMP requirements is limited to "Discretionary" projects because the 'enumerated categories"appear in Board Order No. 96-054 in a subsection qualified by the term "discretionary projects." However, the term "Discretionary" is not defined in the permit. A definition is included in the SUSMP but the term "Discretionary Projects" was deleted from the main body of text. The Regional Board elected to interpret application of the SUSMP requirements in the broadest possible manner.[27] New development storm water controls for projects in "enumerated categories" should not be limited by the condition of "Discretionary".

A review of an interpretation by the California Supreme Court of the term "Discretionary"clearly establishes that it must be read principally on policy considerations relevant to the governmental entity having jurisdiction rather than through a plain semantic inquiry. [*Lipman v. Brisbane Elementary Sch. Dist.*, 55 Cal.2d. 224 (1961); *Johnson v. California*, 69 Cal.2d. 782 (1968)][28] Further, where the nature of a development project involves both 'Ministerial" and "Discretionary" aspects, courts have held that the rule application should

[26] The environmental application of the term "Discretionary" derives from a California Supreme Court ruling in *Johnson v. State of California*, 69 Cal.2d. 782 (1968) where the court ruled that a basic policy decision is considered "Discretionary" and thus subject to immunity from civil action, but not ministerial actions which must face case-by-case adjudication. CEQA guidelines adopt the court interpretations of the two terms.

[27] Regional Board Response to Petition at 25 discusses the Board rationale in more detail.

[28] In these cases, the California Supreme Court rejected a pure mechanical analysis of the term "discretionary" and relied greatly on the policy considerations relevant to the purposes of the governmental action in ruling on the merits of the claim.

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be interpreted to "afford the fullest possible protection to the environment"[*People v. Dept. of Housing and Community Development*, 45 Cal.App.3d 185 (1975); *Day v. City of Glendale*, 51 Cal. App. 3d 817 (1975)][29]. The Regional Board is thus on firm ground when it adopted SUSMP requirements to apply to all development and redevelopment projects in 'enumerated categories" irrespective of whether they are considered 'Discretionary' or 'Ministerial' in a municipal jurisdiction.

C. The Relevance of the Term Discretionary

The definition of "Discretionary" as it is applied in development planning is derived from CEQA. However, whether a project is "Discretionary" or "Ministerial" under CEQA should have little bearing on the Regional Board's ability to subject it to storm water control requirements for new development and significant redevelopment. This is especially true where the origin of the definition in environmental regulation affords municipalities a procedure to limit public review of the potential environmental significance of the action.[30]

In essence, a strict application of the term under CEQA would allow one municipality to consider a SUSMP project category "Discretionary" while in another municipality it may be deemed "Ministerial" because of a municipality preferences and idiosyncrasies. A "Ministerial" project will escape SUSMP requirements if applicability is limited to projects considered "Discretionary." Also under CEQA, similar projects within a municipality may be subject to different treatment depending on designation as "Ministerial" or "Discretionary" on the basis of subtle differences in project characteristics or zoning considerations. [31] Clearly, the Regional Board did not intend for different standards to govern different municipalities or even different standards for similar projects within the same municipality. The determinative consideration for the application of SUSMP requirements should be whether a particular category of development has been determined to cause or contribute to significant pollution of storm water. These categories should be required to implement post-construction BMPs to mitigate storm water pollution.[32] The classification under CEQA should not be the determining factor.

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[29] In these cases, the Appellate Courts ruled that environmental statutes and regulations should be interpreted to afford the maximum protection to the environment within the reasonable scope of statutory language.

[30] In *Day v. Glendale*, 51 Cal.App.3d. 877 (1975), the court ruled that projects not explicitly identified as "Ministerial" in CEQA cannot be considered exempt if they contained some elements that are "Discretionary". Quoting the court, "[to do so] would eviscerate CEQA, a result clearly not intended by the Legislature".

[31] For example in the City of Santa Monica, a restaurant development would be considered "Discretionary" under CEQA only if it served alcohol. A gas station development would be considered "Ministerial" if it is not adjacent to a residential zone [personal communication by Mr. P. Foley, Planning Department, City of Santa Monica, 06/26/2000]. The sale of alcohol at a restaurant or the proximity of a gas station to homes has little or no relevance to its impact on storm water quality.

[32] The Staff Report and Record of Decision at 11-12 discusses the rationale for these categories to be included. AR 3(7).

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D. Application to New Development and Redevelopment Projects

The Regional Board proposes that the definition of "Discretionary Projects" be deleted from the SUSMP section on 'Definitions' since the term no longer has any significance and does not appear in the main body of text.[33] However, if it is found necessary to define the term "Discretionary Project" because it appears in the Los Angeles County MS4 permit, then the Regional Board proposes the following definition:

"Discretionary Project" means a project, other than a project which is in a category enumerated by the Regional Board or State Board, and which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations."

CONCLUSION

Numerical design criteria for treatment BMPs are indispensable, if the Regional Board is to ensure that storm water controls at new development and redevelopment are being implemented "to reduce pollutants to the maximum extent practicable." The choice of design criteria provided by the Regional Board offers municipalities the opportunity to set a design standard that may be different from the 0.75-inch standard, when area conditions substantially differ. The Regional Board supports, "the addition or creation of 5,000 square feet of impervious area or more" in eight of the nine SUSMP categories, as the threshold for SUSMP requirements to apply for redevelopment and remodeling projects, the exception being projects in environmentally sensitive areas. Location of projects should be an important factor in determining the applicability of SUSMP requirements. Consistent with thresholds under CEQA, the Regional Board recommends that the addition or creation of 2,500 square feet or more of impervious surfaces to be considered the minimum threshold for projects in environmentally sensitive areas to be subject to the SUSMP requirements. Finally, the SUSMP requirements should apply to all projects in "enumerated categories" not just projects considered "Discretionary" under CEQA. For these reasons, the State Board must uphold the actions of the Regional Board in adopting the SUSMP and the requirements therein.

[33] See SUSMP, AR 14(1)

California Regional Water Quality Control Board

Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

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Phone (213) 576-6600 FAX (213) 576-6640

Gray Davis
Governor

September 27, 2000

Mr. Craig M. Wilson
Chief Counsel
Office of Chief Counsel
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Dear Mr. Wilson:

COMMENT ON PROPOSED ORDER OF THE STATE BOARD IN THE MATTER OF BELLFLOWER, ET AL., CITY OF ARCADIA, AND WESTERN STATES PETROLEUM ASSOCIATION (REVIEW OF JANUARY 26, 2000, ACTION OF THE REGIONAL BOARD AND ITS EXECUTIVE OFFICER PURSUANT TO ORDER NO. 96-054, PERMIT FOR MUNICPAL STORMWATER AND URBAN RUNOFF DISCHARGES WITHIN LOS ANGELES COUNTY [NPDES No. CAS614001]). [SWRCB/OCC FILES A-1280, A-1280(a) AND A-1280 (b)]

Please find enclosed our comments on the State Board Proposed Order. This is in response to the State Board letter, dated August 28, 2000, allowing for submittal of written comments on the Proposed Order, on the matter of Cities of Bellflower, et al.

If you have any questions, comments, or suggestions on this matter, please do not hesitate to contact me at (213) 576-6605. You may also call my staff member Dr. Xavier Swamikannu at (213) 576-6654.

Sincerely,

Dennis A. Dickerson
Executive Officer

Cc: Jorge Leon, OCC, State Water Resources Control Board
Bruce Fujimoto, DWQ, State Water Resources Control Board
Richard Montevideo, Esq., Rutan & Tucker
Stephen P. Deitsch, Esq., Mayer, Brown & Platt
Lyman C. Welch, Esq., Best, Best, & Krieger
David Beckman/Alex Helperin, Natural Resources Defense Council
Steven Fleischli, Santa Monica Bay Keeper
Heather Hoecherl/Mark Gold, Heal the Bay
Interested Persons Mailing List (Letter only)

Encl: Comment on Proposed Order of the State Board

R0072608

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BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BURBANK, CERRITOS, COMMERCE, DIAMOND BAR, DOWNEY, IRWINDALE, LA-CANADA FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, PALOS VERDES ESTATES, PICO RIVERA, POMONA, RANCHO PALOS VERDES, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, AND

THE CITY OF ARCADIA, a municipal corporation AND

WESTERN STATES PETROLEUM ASSOCIATION , a Trade Association

Petitioners,

v.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, and DENNIS DICKERSON, Executive Officer, Los Angeles Regional Water Quality Control Board.

Respondents,

File Nos.: A-1280; A-1280(a); A-1280 (b)

REGIONAL BOARD COMMENT ON PROPOSED ORDER

I. INTRODUCTION

The State Water Resources Control Board (State Board) conducted a hearing on the above matter in Torrance, California, on June 7 and June 8, 2000. On July 12, the State Board invited the designated parties to respond to four questions in a Post-hearing Brief which was to be submitted no later than July 7. The Regional Board submitted its Post-hearing Brief on July 7. On August 28, the State Board issued a Proposed Order on the matter, and invited the designated parties to comment on or before September 28. The Regional Board's response follows.

II. COMMENT ON THE PROPOSED ORDER

The Regional Board supports the State Board's decision to uphold the authority of Regional Boards to establish numerical water quality design criteria for Best Management Practices (BMPs) "to reduce pollutants in municipal storm water discharges to the maximum extent practicable" (MEP) as required by federal law. This decision resolves what constitutes the fundamental challenge by Petitioners of the Board approved Standard Urban Storm Water Mitigation Plan (Final SUSMP).

The Regional Board respectfully disagrees with the State Board on the following issues that limit the applicability of the Final SUSMP, and requests that the State Board modify its final decision appropriately. Specifically, the Regional Board contends that, (i) Retail Gasoline Outlets (RGOs) should not be categorically exempt from BMP design standards; (ii) Projects in Environmentally Sensitive Areas (ESAs) should be subject to SUSMP requirements; (iii) SUSMP requirements should apply to enumerated projects irrespective of whether they are considered "Discretionary" or "Ministerial" as interpreted under the California Environmental Quality Act (CEQA); and (iv) Impracticability waiver beneficiaries should be required to transfer funds to regional mitigation projects, since regional funds and projects have already been established.

In addition the Regional Board recommends that the State Board, (i) amend its definition of "redevelopment", for purposes of clarity, as suggested by the Regional Board herein; and (ii) correct, to reflect the record, the statement that the Regional Board did not give interested persons and Permittees adequate time to review late revisions to the Final SUSMP or provide comment.

Regional Board Recommended Changes

A. Retail Gasoline Outlets Do Not Merit An Exemption

The State Board's conclusion to exempt RGOs from the numerical mitigation standard is not supported by the evidence in the Administrative Record (AR) and is contrary to State and federal law. Presumably, RGOs are being exempted because they are, (i) heavily regulated; (ii) limited in their ability to construct infiltration BMPs; (iii) generally small in size; and (iv) storm water treatment may not be feasible or safe.[1]

RGOs are a well identified source of urban storm water pollutants that impair receiving waters.[2] The State Board appears to accept the evidence in the record that RGOs are appropriately identified by the Regional Board as being subject to SUSMP requirements because they discharge significant quantities of pollutants of concern.[3] Also, Petitioner Western States Petroleum Association (WSPA) acknowledges that storm water discharges from even "normally operated and maintained" RGOs are at least as bad

[1] Respondents note that the issue of numerical design criteria application to RGOs was not among the four questions that designated parties were asked to address in the Post-hearing Brief.

[2] AR Vol. 10, Item 16 Ref #113 at p 30. This study funded by the USEPA and conducted by Sacramento County identified heavy metals such as lead, copper, and zinc in significant concentrations in storm water runoff from gas stations. Volatile Organic Compounds (VOCs) from fueling areas were rarely detected because of their volatility. Data on Polycyclic Aromatic Hydrocarbons (PAHs) was inconclusive because analytical detection limits used were higher than regulatory action levels. See also AR Vol. 10, Item 16 Ref # 29 generally for a national view.

[3] State Board Proposed Order at 18, admits that the evidence [in the record] "shows that each listed category can be a significant source of pollutants..."

as discharges from commercial parking lots and diffuse urban runoff.[4] The obvious reason that "normally operated and maintained" RGOs do not demonstrate any improvement in storm water discharge quality is because existing BMPs do not address pollutants generated by motor-vehicle traffic.[5] Heavy metals, significant concentrations of which occur in storm water discharges from RGOs, have been demonstrated to be the main cause of toxicity in Santa Monica Bay during wet weather.[6]

The State Board surmises that RGOs merit a categorical exemption because they are over-regulated, yet does not enumerate what these regulations are, and if any are protective of surface water quality.[7] Under State law, the State Board is the primary authority for implementation of the federal Clean Water Act (CWA), and for matters related to water quality within the State.[8] The Regional Board is unaware of any basis in federal or State statute that permits the State Board or Regional Boards to abdicate their water quality authority because discharges from facilities that impact water quality are already regulated for other purposes. Attainment and maintenance of receiving water objectives and the protection of beneficial uses should be the paramount considerations.

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[4] AR Vol. 10, Item 16, Ref #173 at p 13. The WSPA sponsored study concludes that pollutant concentrations in storm water discharges from RGOs are similar to concentrations from commercial parking lots and diffuse urban runoff. The Proposed Order correctly does not exempt commercial parking lots, restaurants, and residential/ commercial development from the numerical mitigation criteria, yet RGOs are exempted. See also June 7 State Board Hearing Transcript at p 231; comment by WSPA witness, that "concentrations of metals, hydrocarbons, and solids were no higher than.... roads and parking lots".

[5] See June 8 State Board Hearing Transcript at p 136, Regional Board staff testimony that current BMPs at RGOs do not address pollution associated with vehicular traffic.

[6] See Evidence and Exhibit Supplement submitted by Respondent Regional Board on May 3, – "Study of the Impact of Storm Water Discharge on Santa Monica Bay – Executive Summary", Los Angeles County Department of Public Works (1999), which identifies Zn and Cu as principal pollutants that cause storm water toxicity.

[7] The Regional Board's review of regulations that affect RGOs identified, (i) business license for business operation, (ii) Fire Department for tank/ piping integrity and gasoline storage; (iii) County Public Works for underground storage of hazardous chemicals; (iv) Air Quality Management District for VOC emissions; (v) Sanitation District for any sanitary sewer discharges; (vi) County Weights and Measures for sale of gasoline; (vi) Department of Toxics Substance Control for waste motor oil disposal; (vii) County Health for food and beverage sale; and (viii) Regional Board for regulation of leaking tanks to protect groundwater.

[8] Cal. Wat. Code § 13160 states that, "the State Board is designated as the state water pollution control authority for all purposes.... in federal act." Cal. Pub. Res. Code § 30412 states that, "other State agencies shall not modify, adopt conditions, or take any action in conflict with any determination by the State Board in matters relating to water quality".

Second the State Board finds that RGOs are limited in their ability to construct infiltration BMPs, but does not discuss what the compelling limitations are. Infiltration is but one form of mitigation. The SUSMP clearly does not mandate infiltration BMPs. Other options exist such as the installation of fabricated treatment BMPs to remove storm water runoff pollutants using physical, biological, or chemical processes.[9] Petitioner WSPA in its challenge and oral arguments did not present any coherent or convincing basis to validate the claim of limited ability.

Third, the State Board concludes that the relative "small size" of RGOs provides a compelling basis to exempt RGOs from the requirement to treat storm water. It should be noted that presently restaurants are subject to the SUSMP numerical mitigation requirement, where the area of development or redevelopment is 5,000 square feet or more. Similarly, commercial parking lots 5,000 square feet or more are subject to the numerical mitigation criteria. In contrast, the typical modern gas station is between 15,000 and 30,000 square feet.[10] The rationale of size thus appears flawed. The State Board's Proposed Order upholds the application of the numerical mitigation criteria to a 5,000 square feet restaurant development and a 5,000 square feet parking lot but not to a 30,000 square feet RGO development, which may contribute higher concentrations and loadings of storm water pollutants

Further, while the size of RGOs may be a consideration to assess their significance as a source of pollutants, their prolific numbers should also be a factor to be taken into consideration. There are nearly 3,500 operating RGOs in Los Angeles County. [11]

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[9] June 7/8 State Board Hearing Transcript at p 41 and p 134. Regional Board staff comment in response to questions and cross-examination on the feasibility of storm water treatment at RGOs. Other jurisdictions do not exempt RGOs from requiring storm water treatment. In fact "oil-water separators" fitted with a rain diversion valve were at one time commonly installed at RGOs because of local agency industrial waste regulations.

[10] See Footnote 2 *supra*. Gas stations in the study ranged in area from 18,358 to 30,423 square feet.

[11] The Regional Board database has a record of approximately 4,600 RGO sites with leaking underground tanks. There are an estimated 3,500 gas stations currently operational in Los Angeles County that are covered by the municipal site-visit/ inspection program under the permit.

Undoubtedly, RGOs in Los Angeles County are a significant source of storm water pollutants because of their sheer number even if each facility is relatively small in area. Moreover, the on-going redevelopment of gas station sites to retrofit underground storage tanks for groundwater protection provides Petitioner WSPA a unique opportunity to reconfigure facilities for surface water quality improvements as well.

Fourth, the State Board surmises that storm water treatment may not be feasible or safe at RGOs. The Regional Board is not aware of any basis in the record to substantiate such a determination. Fabricated treatment systems have been commonly used at RGOs to separate waste-oil before discharge to the sanitary sewer system. Safety or feasibility has not been an issue when sanitation districts required RGOs to install treatment systems in order to obtain connection permits to the sanitary sewer system. There is no evidence in the record to support Petitioner WSPA's argument that the requirement to treat storm water somehow introduces new and different safety and feasibility considerations, as when compared to wastewater treatment systems which RGOs have readily installed.

B. Environmentally Sensitive Areas Is An Appropriate SUSMP Category

The Regional Board disagrees with the State Board's Proposed Order to exclude ESAs from SUSMP requirements. Admittedly, the ESA category is "locational" rather than "developmental" and presents some difficulty in application. The State Board's Proposed Order states that ESAs were not discussed by interested persons during permit adoption and that ESAs are subject to extensive regulations under other regulatory programs, without enumerating what these are. Significantly, the Proposed Order also does not explain whether these unidentified regulations adequately protect impacts to surface water quality.

Contrary to the statement in the Proposed Order, ESAs were indeed discussed during the Los Angeles County MS4 permit adoption process. For example, the permit includes

requirements for new development and redevelopment that apply to ESAs.[12] Also, the Regional Board lists ESAs as a specific SUSMP category in the City of Long Beach MS4 permit adopted on June 15, 1999.[13] Similarly, ESAs are included as a category for the application of numerical mitigation standards in the Ventura County MS4 permit adopted by the Regional Board on July 27, 2000.

The application of environmental regulations to new development and redevelopment based on category typing as "developmental" or "locational" is not treated under State law as being incompatible. For example, CEQA exempts certain "developmental" projects from its requirements but does not do so when the projects are "locational", i.e., when situated in ESAs.[14] In this respect, the State Board might wish to look at actions and interpretation of "development" in ESAs, as they pertain to water quality, by the California Coastal Commission, which administers the California Coastal Act.[15] This is pertinent because the State Board has entered into a Memorandum of Understanding (MOU) with the Coastal Commission to jointly promote the protection of water quality and natural resources from adverse impacts of non-point pollution including urban runoff.[16] At the California Commission's January 2000 Public Meeting, the Commission adopted the numerical mitigation criteria for post-construction BMPs for all development projects in the coastal zone without qualification. The Coastal Commission reaffirmed its

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[12] See Board Order No. 96-054, Pt 2. III.A.3, p 36 requiring development planning guidelines to address riparian corridors, wetlands, and biological integrity of drainage systems.

[13] See Board Order No. 99-060, Pt 4. I.D.5, at p 17, admitted into the record, without objection, by Respondent Regional Board at the June 8 State Board Hearing.

[14] See Post-hearing Brief at footnote 25 citing 19 CCR 15301 which exempts certain categories except where they are located in ESAs.

[15] Cal. Pub. Res. Code § 30000 *et seq.* Specifically § 30231 requires that the Commission regulate land development to protect the coastal environment from adverse impacts of storm water runoff. The Commission has a special responsibility to protect ESAs in the coastal zone. Cal. Pub. Res. Code § 30107.5 defines ESAs and Cal. Pub. Res. Code § 30240 specifies the degree of protection that must be afforded.

[16] See "Memorandum of Understanding Between the State Water Resources Control Board and the California Coastal Commission, February 2, 2000, Plan for California's Nonpoint Source Pollution Control Program (2000)".

stance in regards to numerical mitigation criteria at its August 2000 Public Meeting.[17] In fact, an argument can be made that the State Board's interpretation of "development" projects subject to regulation for water quality within the coastal zone so long as it is inconsistent with the Coastal Commission's rule, violates Cal Pub. Res. Code § 30400.[18]

If the State Board's central concern is that ESAs were not adequately discussed during adoption of the Los Angeles County MS4, the Regional Board reaffirms its intent to add ESAs to the list of SUSMP categories when the permit is reissued in 2001. The State Board is requested to clarify that its ruling, if left unchanged from the Proposed Order, does not apply to the Regional Board adopted City of Long Beach MS4 permit (Board Order No. 99-060) and the Ventura County MS4 permit (Board Order No. 00-108). The ESA category was fully discussed during the adoption of these two MS4 permits. We note that the State Board rejected the Regional Board's recommendation to provide a development project area threshold for ESAs based on current State law, which would have cured any draconian interpretation of the rule as speculated by Petitioners.[19]

C. Include All Projects in SUSMP Categories

The Regional Board respectfully disagrees with the State Board's determination that the Regional Board acted "inappropriately in expanding the SUSMPs to include non-discretionary projects". We find that limiting the application of SUSMP requirements to "discretionary projects" is not supported by the federal CWA, EPA storm water regulations, the California Water Code, or the California Public Resources Code.[20]

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[17] Regional Board Member Ms. Susan Cloke and Board staff member Dr. Swamikannu briefed the Commission, by invitation, on technical and policy issues related to SUSMPs at the meeting.

[18] Cal Pub. Res. Code § 30400 states that in the absence of specific authorization by law or agreement with the Coastal Commission, no agency shall exercise powers established by the California Coastal Act or the federal Coastal Zone Management Act.

[19] See Respondent Regional Board's Post-hearing Brief at footnote 25 citing, 19 CCR 15301. CEQA exempts projects in ESAs that disturb less than 2,500 square feet of area.

[20] Please see the Regional Board's comment herein at p 6 on exclusion of ESAs.

The main basis behind the determination appears to be the observation that the term "discretionary" appears in several parts of the permit (Board Order No. 96-054). However, the term "discretionary" was not defined in the permit even though the permit contains a section on Definitions.[21] Indeed, as the controversy indicates, there was no "meeting of the minds" as to its meaning when the permit was adopted. Thus, the Regional Board did not expand the scope of the SUSMPs at its January 26 Board Hearing. The "discretionary" limitation, as contemplated in CEQA, never existed in the permit and was never adopted by this Board. Rather, the Regional Board followed traditional rules of regulatory interpretation and deleted the "discretionary" limitation and definition in the SUSMP, articulated retrospectively by Permittees, when there is neither the basis in law nor any clue as to the Regional Board's intent when the permit was adopted in 1996. The CEQA definition of "discretionary" was a concept introduced much later by Petitioners in an attempt to limit applicability of the SUSMPs.[22]

If the permit is read as a whole, the Regional Board clearly intended that storm water controls on new development and redevelopment apply to all types of projects, not just 'discretionary' projects'. Specific language in the permit, in addition to the development of SUSMPs, requires the update of CEQA guidelines and General Plans to consider storm water impacts.[23] The State Board's Proposed Order opens up an unintended loophole.[24] If the State Board's determination remains unchanged, the Regional Board expresses its firm intent to close the loophole when the Los Angeles County MS4 permit is reissued in 2001. Recently, the Regional Board adopted the Ventura County MS4 permit (Board Order No. 00-108) without any reference to the term 'discretionary' therein.

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[21] See Board Order No. 96-054, Attachment D, Glossary of Terms.

[22] The CEQA definition of "discretionary" that appears in the Final SUSMP is an inadvertent carry over from the Aug 12, 2000, SUSMP submitted by Permittees. There is no reference to the term in the main document.

[23] See Board Order No. 96-054, Pt 2. III.A.3, p 36 requiring the update of CEQA guidelines and General Plans.

[24] Case in point, in the City of Los Angeles in the past year there were 37,514 development project approvals, of which only 1,276 (3.4 percent) were in the "discretionary" category as defined under CEQA.

D. Retain the Requirement to Regionally Mitigate Where A Waiver is Granted

The Regional Board respectfully requests that the State Board reconsider its decision to eliminate the requirement to "mitigation fund" regional projects where an infeasibility waiver is granted from the requirement to treat storm water.[25] The Proposed Order calls it a "positive idea for obtaining regional solutions", yet deletes the requirement because Permittees are yet to establish a management and fund administration framework. Quite to the contrary the framework is already in place.

For example, the County of Los Angeles, as the Principal Permittee for the Los Angeles MS4 program, currently supports regional permit tasks such as public education/ outreach and MS4 monitoring using funds from a regional benefit assessment. Also, the Southern California Association of Governments (SCAG), the federal CWA § 205 (j) regional planning agency, expressed a definite interest, during the SUSMP hearings, in coordinating the development of regional solutions to storm water problems.[26] Sharing regional costs already occurs in SCAG's other program areas. Similarly, the TREEPeople, a non-profit environmental group, has been working with local agencies and school districts to implement solutions to mitigate runoff and promote water reuse.

Without doubt, there exists presently in the Los Angeles Region public and non-profit entities fully capable or already involved in developing and implementing regional solutions to storm water pollution. The purpose of the requirement in the Final SUSMP, besides consideration of equity, was to accelerate implementation and to support the efforts of such groups. The Regional Board's action was not contrary to state law or policy. Thus, the State Board may choose to defer to the Regional Board to make the judgement of reasonableness of the requirement to "mitigation bank".

[25] Respondents note that the issue of storm water mitigation funding was not among the four questions that designated parties were asked to address in the Post-hearing brief. See also Footnote 1 *supra*.

[26] See AR Vol. 6, Item 23, where SCAG proposes to lead and coordinate regional solutions.

E. Edit the Definition of "Redevelopment"

The Regional Board suggests that the State Board amend its definition of "redevelopment", which is derived from the Regional Board's Post-hearing Brief, to provide better clarity. We postulate that the first part of the definition should describe the kind of practices that constitute redevelopment. The second part should explain its application to SUSMP categories.

Our recommendation is as follows, - Redevelopment ~~includes~~ **means**, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/or exterior construction or remodeling; replacement of impervious surface that is not part of routine maintenance activity; and land disturbing activities related ~~with~~ **to** structural or impervious surfaces. **For the purposes of this rule**, redevelopment includes, on an already developed site, the ~~creation~~ **replacement** or addition of ~~at least~~ 5,000 square feet **or more** of impervious surfaces. Where redevelopment results in an increase of less than fifty percent of the impervious surface of a previously existing development, and the existing development was not subject to these SUSMP requirements, the design standards apply only to the addition and not to the entire development.[27]

F. Regional Board Provided Interested Persons and Permittees Adequate Time.

The State Board expresses a concern that the Regional Board did not provide interested persons and Permittees adequate time to review late revisions or to comment on them at the January 26 hearing. Suggestions include that the Regional Board should have deviated from its hearing procedure, and should have allowed groups to make joint presentations.

[27] Changes to the State Board's definition in the Proposed Order are indicated by bold and strikeouts. The phrase 'at least 5,000 square feet" does not make clear that the rule applies to projects above the threshold, only that it might. The phrase "5,000 square feet or more" leaves no room for doubt.

The Regional Board adopted revisions at the January 26 to resolve contested issues that were discussed over a period of several months. These were not new issues that would warrant the granting of additional time to conduct adequate review. Petitioners' argument for additional time was a strategic move to delay the process.[28] We submit that the State Board's comment on the argument inadvertently validates such a delaying strategy. Followed to its logical conclusion, neither the State Board nor the Regional Board would be able to conclude any matter, because changes made at Board hearings, in response to testimony on contested issues, would require postponing the decision.

Further, the Regional Board did not deviate from its established hearing procedure for the January 26 meeting for good reason. At the September 17, 1999, meeting on the same matter, Petitioners complained that the Regional Board was being prejudicial because it deviated from the hearing procedure by allowing the environmental community to make a joint presentation.[29] Consequently, both Permittees and the environmental community were allowed to make joint presentations at the January 26 meeting, each designated party being given a 30-minute block. Co-petitioner Building Industry of Southern California (BIA) was invited to become part of the Permittee group presentation, because BIA was not recognized as a separate designated party.[30] Thus, while the State Board may have cured any alleged harm by conducting a two day hearing on the matter, the Regional Board's process did not cause any harm that is evident from the record.

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[28] See June 8 State Board Hearing Transcript at p 157 where Petitioners request setting up a statewide committee to discuss the matter further - continuing the pattern of procrastination. See also Petitioner Bellflower *et al.* Post-hearing Brief at p 3.

[29] See AR Vol. 12, September Regional Board Hearing Transcript at p. 203. BIA representative objects to the group presentation format allowed for the environmental community, and states, "if we are going to do this in the future,.... set the rules prior to the hearing".

[30] Respondent Regional Board notes that while BIA did not present comments jointly with the Permittee group at the January 26 Board Hearing, BIA is a Co-petitioner with municipalities in Complaint Bellflower *et al.* and not a separate Petitioner.

III. CONCLUSION

In conclusion, the Regional Board strongly supports the State Board's decision to uphold the authority of Regional Boards to establish numerical BMP water quality design criteria to regulate the discharge of pollutants in storm water from MS4s to meet the statutory standard of MEP.

The Regional Board requests that the State Board revise the Proposed Order to make the following changes:

(i) Correct the record to state that the Regional Board's hearing process did not cause Petitioners any harm that is evident from the record, notwithstanding the fact that the State Board's hearing process cured any alleged harm.

(ii) Edit the definition of "redevelopment" as suggested by the Regional Board herein for clarity.

(iii) Eliminate the categorical exemption from the numerical mitigation standard provided to RGOs, because it contradicts the application of the criteria to other similar SUSMP categories and is neither supported by the evidence in the record nor State and federal law.

(iv) Reinstate ESAs as a SUSMP category because the designation is consistent with the interpretation of "development" regulation by the Coastal Commission, with whom the State Board has an MOU to protect water quality and to reduce the adverse impact of urban runoff on natural resources.

(v) Delete the limitation imposed by the State Board on application of the SUSMP requirements to only "discretionary projects", as understood in CEQA, because the limitation in the same sense was not adopted by the Regional Board in 1996 and is not supported by State and federal law.

(vi) Reinstate the requirement to mitigation bank where an impracticability waiver is granted, because the infrastructure and the institutions are already in place to implement regional solutions.

Finally, the Regional Board thanks the State Board for fully considering and deliberating on the matter, conducting a two day hearing in Torrance, Los Angeles County, and holding a special meeting in Sacramento before issuing a decision.

STATF OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, GOVERNOR

CALIFORNIA COASTAL COMMISSION

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October 2, 2000

Mr. Craig M. Wilson
Chief Counsel
State Water Resources Control Board
901 P Street
P.O. Box 100
Sacramento, California 95812-0100

RE: PROPOSED ORDER REGARDING THE REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, STANDARD URBAN STORM WATER MITIGATION PLANS

Dear Mr. Wilson:

The staff of the California Coastal Commission (CCC) supports the State Water Resources Control Board (State Board)'s proposed order to uphold the numeric water quality design criteria for Best Management Practices (BMPs) developed by the Regional Water Quality Control Board, Los Angeles Region (LARWQCB) in the Standard Urban Storm Water Mitigation Plan (SUSMP) issued March 8, 2000. We believe that these design standards represent a significant step towards implementing effective measures for controlling polluted runoff. The CCC has similarly established a design goal, to be evaluated on a case-by-case basis, for BMPs (or suites of BMPs) to treat, infiltrate or filter stormwater from each runoff event, up to and including the 85th percentile, 24-hour runoff event, throughout the Coastal Zone.

However, we have concerns regarding several of the State Board's modifications of the SUSMP requirements. These are as follows: 1) the categorical exemption of Retail Gasoline Outlets (RGOs) from the SUSMP requirements, 2) the elimination of projects within Environmentally Sensitive Areas (ESAs) from the SUSMP requirements, and 3) limiting SUSMP requirements only to "discretionary" projects as interpreted under the California Environmental Quality Act (CEQA).

The current regulatory framework under which RGOs operate does not adequately address nonpoint source pollution generated from these facilities. As you know, RGOs have been identified nationwide as a source of urban storm water pollutants, which can, especially in heavily urbanized areas, contribute significantly to the impairment water quality. Polluted runoff associated with the traffic volumes at RGOs and their relatively large area of impervious surfaces

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can be significant. This polluted runoff may be as much or greater than that generated at other similarly sized retail establishments or parking lots, which are required to comply with the SUSMP requirements. To control nonpoint source pollution generated from RGOs, we believe that a categorical exemption should not be created for RGOs and that they should be subject to the same SUSMP requirements as other retail facilities (i.e., where the area of development or redevelopment is 5,000 square feet or more). The CCC therefore urges the State Board to uphold the Regional Water Board's decision to apply the SUSMPs to all RGOs.

The CCC believes that the SUSMPs should be applied to all projects within or adjacent to ESAs. Development activities in an around ESAs can have a significant impact on water quality. Many of the ESAs within the jurisdiction of the CCC are directly affected by runoff from adjacent urban areas. ESAs by their very nature require thoughtful consideration throughout the planning and development process. Minimizing impacts of nonpoint source pollution on ESAs should be an integral part of this process.

The State Board's reasoning for exclusion of the ESA category as "locational" rather than "developmental" is unclear. Another category retained within the SUSMP requirements "Single Family Hillside Residences" appears to be locational as well. Regardless of the distinction, controlling nonpoint source pollution impacts on ESAs is important. The CCC understands that the LARWQCB intends to add ESAs to the list of SUSMP categories when the permit is reissued in 2001. The CCC therefore urges the State Board to uphold the Regional Water Board's decision to include ESAs as a SUSMP category in the interim.

The CCC believes that the SUSMPs should be applied to all projects within the categories of development to which the SUSMPs apply, not simply to those projects that are discretionary projects within the meaning of CEQA. The CCC is concerned that exempting all nondiscretionary projects from the SUSMPs will significantly reduce the effectiveness of the Regional Water Board's storm water pollution control efforts -- thereby impeding the CCC's efforts to protect and restore the quality of water along the Los Angeles County coast. The State Board's draft order itself suggests that exempting nondiscretionary developments from the SUSMPs may undermine the Regional Water Board's storm water control program. (See Draft Order, at p.25.)

In particular, the CCC believes the distinction between discretionary and nondiscretionary projects that is so crucial in the context of CEQA has no bearing on storm water control efforts. The crucial inquiry for the purposes of storm water control is whether the characteristics of a particular development are such that it is likely to contribute to storm water pollution problems. Whether the developer may proceed with a project as a matter of right or must instead obtain a variety of discretionary approvals is irrelevant to the impact of the project on storm water runoff. For example, a 50-space parking lot gives rise to the same storm water runoff concerns regardless of whether approval of the parking lot is discretionary or ministerial.

The CCC therefore urges the State Board to uphold the Regional Water Board's decision to apply the SUSMPs to all projects that fall within one of the covered categories of development regardless of whether the projects require discretionary approval.

We appreciate your consideration of these comments. If you have any questions regarding these comments, please contact Alfred Wanger of my staff at (415) 597-5886.

Sincerely,

Jaime C. Kooser, Ph. D., Deputy Director
Energy, Ocean Resources, and Water Quality

NATURAL
RESOURCES
DEFENSE
COUNCIL

April 11, 2000

VIA FACSIMILE (916/653-0428) & U.S. MAIL

Elizabeth Jennings
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Re: Petitions of the Cities of Artesia, *et al.*, the City of Arcadia, and Western States Petroleum Association, for Review of January 26, 2000 Action of the Los Angeles Regional Board, "and Actions and Failures to Act by Both the Regional Board and Its Executive Officer"
Timing and Format of Responses

Dear Ms. Jennings:

We are preparing responses to the above-referenced petitions and are writing to clarify two procedural issues regarding the timing and format of those responses. It is our understanding that the State Board intends to consolidate these petitions for purposes of its review. We further understand that at least one of the petitioners listed above has filed an amendment to its original petition, subsequent to your March 30, 2000, 20-Day Notice Letter informing interested parties of the existence of the completed petitions. Finally, we understand that you intend to issue another 20-Day Notice Letter specifically concerning that amendment. In addition to the delay caused by the amendment, we have had some difficulty obtaining some of the petitions from the petitioners.

Due to the consolidation of the petitions, and in order to promote efficiency, we intend to submit one comprehensive response to all of the petitions. Furthermore, because of the delay caused by the amendment to one petition, and our difficulty in obtaining certain petitions from the petitioners, we intend to submit our consolidated response no later than twenty days after your issuance of a follow-up 20-Day Notice Letter regarding the amendment (assuming we have received the complete set of petitions and amendments by then).

When we spoke on April 10, 2000, you indicated informally that this approach would be acceptable. We are writing to confirm our understanding of this process going forward.

R0072626

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Thank you very much for your assistance. If this does not reflect your understanding in any way, or if you have any questions about anything in this letter, please contact one of us immediately, at (323) 934-6900.

Sincerely,

David S. Beckman
Alex N. Helperin

cc: **Xavier Swamikannu**
Richard Motevideo, Esq.
Lyman C. Welch, Esq.
Stephen P. Deitsch, Esq.
Steven Fleischli
Mark Gold
Heather Hoecherl

RECEIVED
2000 APR 13 P 1:58
STATE WATER RESOURCES CONTROL BOARD
QUALITY CONTROL BOARD
LOS ANGELES REGION

NATURAL RESOURCES DEFENSE COUNCIL

April 18, 2000

LOS ANGELES REGION

VIA FACSIMILE (714/546-9035) & U.S. MAIL

Richard Montevideo
Rutan & Tucker, LLP
P.O. Box 1950
Costa Mesa, CA 92628-1950

Re: Petitions of the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association, for Review of January 26, 2000 Action of the Los Angeles Regional Board, "and Actions and Failures to Act by Both the Regional Board and Its Executive Officer."

Dear Mr. Montevideo:

We are in receipt of your April 18, 2000, letter to Elizabeth Jennings of the State Water Resources Control Board, objecting to our request for an extension of time in which to comment on the above-referenced petitions. As we indicated in our letter of April 11, 2000, Ms. Jennings has already approved the timing and approach articulated in our letter. Furthermore, the extension we requested has since been re-confirmed, both by letter and also during a subsequent April 14, 2000 conversation with Ms. Jennings. We understand that the new response date will be sometime next month, and that Ms. Jennings will be notifying all parties of the exact deadline shortly.

In this regard, your letter indicates that it is "inconsistent with the regulations to provide additional time to respond" and that "there is no basis and no authority to extend the time to respond to the Petition under the regulations or otherwise." This is patently untrue. Indeed, state board attorneys routinely approve reasonable extensions in many scenarios. An extension of time is particularly appropriate in an instance such as this one, in which interested parties intent on opposing an appeal are faced both with a shifting target (amended appeals) as well as difficulty in obtaining the original petitions from appellants.

Sincerely,

David Beckman /a.h.

David S. Beckman
Alex N. Helperin

R0072628

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FAX TRANSMISSION

This transmission is 38 pages including this cover sheet.
If transmission problems occur, please notify Virginia at (323) 934-6900.

DATE: May 2, 2000

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	Lyman C. Welch, Esq.	312/701-7711
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FROM: Alex N. Helperin

MESSAGE: Attached is:

MEMORANDUM OF POINTS & AUTHORITIES IN RESPONSE TO PETITIONS FOR REVIEW

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R0072630

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STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In Re: the Consolidated Petitions of the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association, for Review of Actions and Inaction by the California Regional Water Quality Control Board, Los Angeles Region in Connection with Resolution No. R-00-02 (Jan. 26, 2000).	MEMORANDUM OF POINTS AND AUTHORITIES OF NRDC, SANTA MONICA BAYKEEPER, AND HEAL THE BAY IN RESPONSE TO PETITIONS FOR REVIEW

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I. INTRODUCTION

The Petitions for Review filed by the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association ("WSPA") (collectively, "Petitioners"), constitute a desperate attempt to avoid having to take any real action to control the ever-increasing stormwater problem that is the number one source of water pollution in Southern California – and the worst such problem in the Nation.[1] The petitions are completely without merit and should be denied. In fact, if the State Board were to conclude that this extremely careful and well-considered regional board action should be overturned, no action by any regional board in the state could withstand scrutiny.

A. Factual Background

"Communities across the nation are finding that their water resources are degrading in response to growth and development."[2] The Center for Watershed Protection's "four-year effort to examine new ways to reduce pollutant loads and protect aquatic resources" revealed that "a fundamentally different approach toward development [is] needed to reliably protect streams and other aquatic resources."[3] In fact, development planning is generally recognized as one of the most critical aspects of any stormwater management program, and assuring that appropriate best management practices ("BMPs") are implemented in the development process, and that they are sized sufficiently to be effective, is essential to these programs.

Recognizing these facts, on January 26, 2000, the Regional Water Quality Control Board, Los Angeles Region ("Regional Board" or "LA-RWQCB") took its first significant step to stem the ever-increasing flow of stormwater pollution into Los Angeles-area rivers and bays. The Regional Board concluded that, like hundreds of other municipalities across the country, Los Angeles area municipalities needed to adopt a meaningful approach to new and redevelopment, one that controls urban runoff and prevents future development from further polluting the area's waterways.

---

[1] See September 6, 1999 *Los Angeles Times* article, attached hereto as Exhibit A.

[2] Rapid Watershed Planning Handbook (Center for Watershed Protection, Oct. 1998) at xiii, attached hereto as Exhibit B.

[3] Site Planning for Urban Stream Protection (Center for Watershed Protection, Dec. 1995) at 1, attached hereto as Exhibit C.

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This action was long-overdue. The municipal stormwater permit issued to the Los Angeles-area municipalities ("the Permit")[4] was adopted by the Regional Board in the Summer of 1996, and it explicitly requires – by July, 1998 – the adoption of a Standard Urban Stormwater Mitigation Plan ("SUSMP") to guide development planning and ensure that completed projects can control their polluted runoff. Permit, Part 2.III.A.1.b. and c. The process of developing the SUSMP, like so many of the "model programs" that were to be developed under the Permit, was delayed, in large part, by municipal resistance. Finally, on January 26, 2000, almost four years after the Permit was adopted, the Regional Board approved the SUSMP, via Resolution Number R-00-02 ("R-00-02" or the "Resolution"), which is part of the administrative record.

The Regional Board's long-awaited action is of critical importance to the efforts to control stormwater in the Los Angeles area, and it received wide-spread support throughout the region. Because it requires development projects to take responsibility for their runoff, it may allow the ever-growing metropolis that is Los Angeles County and environs to continue to grow without destroying its own resources and livability. The Regional Board's adoption of the SUSMP was praised by the *Los Angeles Times* in back-to-back editorials. See Exhibit D. It was also supported by many municipalities and other government entities, including, among others, the City of Los Angeles, the United States Environmental Protection Agency, and the California Coastal Commission. See Exhibits E, F, and G.

Nevertheless, several of the municipal permittees under the Permit ("Permittees"), along with the Building Industry and WSPA, filed petitions that – given their "shotgun approach" – show that they are desperate to find some technicality they can use to overturn the Regional Board's action. These Petitioners, and particularly the Permittee-Petitioners who have dragged their feet on Permit implementation over the last four years, now have the audacity to raise procedural issues to further delay its implementation. Many of their claims were never even raised below, and thus, cannot legally be raised on review. Those claims that were raised below, and that are raised again here, are uniformly without merit, as is explained below.

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[4] NPDES No. CAS61400, Order No. 96-054.

In addition, the doctrine of estoppel precludes bad actors, such as the Petitioners, from raising these arguments now, when the implementation of the SUSMP is already nearly two years late. See 11 B.E. Witkin, Summary of California Law, "Equity" (9th Ed. 1990) §§ 7-10 and 176.

B. Petitioners' Claims

The Petitioners claims fit into four general categories, as summarized below and discussed in detail in the "Argument" section of this brief.

1. Misguided Procedural Claims

Petitioners argue that (1) the Regional Board's Executive Officer never formally disapproved their proposed SUSMP, as allegedly required by the Permit; (2) the final SUSMP was prepared by Regional Board staff, instead of the Permittees; (3) the Regional Board failed to follow the Administrative Review Process laid out in the permit; and (4) late modifications to the SUSMP deprived them of due process. These procedural claims range from the misguided to the absurd. The Board's actions clearly indicated that the Permittees' proposed SUSMP was inadequate, and that the Board would thus move to complete an SUSMP, as it was required to do. In so doing, the Board provided ample opportunity for public participation. Furthermore, the changes that were instituted by the Board leading up to the January 26, 2000 hearing ("Hearing"), as well as those made at the Hearing, were all logical outgrowths of the extensive process that preceded them, and were therefore all legitimate changes that did not necessitate recirculation. In fact, not only were they logical outgrowths of the process, but virtually all of those changes had been formally discussed in previous proposals and hearings, and many of the changes simply constituted a return to the form and content of previous proposals. Thus, these changes did not necessitate circulation of yet another revised version of the long-overdue SUSMP.

2. Misrepresentations of Previous Regional Board Orders and Resolutions

Petitioners point to previous Regional Board resolutions and orders, in hopes of finding something within those documents to preclude the instant action. They claim that the Regional Board's approval, last April, of a list of BMPs somehow estopped the Board from rejecting the Permittees' proposed SUSMP. They also point to sections of the Permit itself, which they claim limit the Board's authority. In reality, the BMP-list approval was a precursor to the SUSMP, the

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sections of the Permit at issue provided only minimum requirements, and neither of these things imposed any restraint on the Regional Board's authority to act as it did on the SUSMP.

3. Attacks on the Regional Board's Findings

Petitioners attack the Regional Board's findings and claim that the Board failed to conduct certain allegedly mandatory evaluations. However, a brief review of the Resolution leaves one wondering whether the Petitioners even read it, as it begins with an explicit list of the Board's extensive findings. Indeed, each of the issues that the Petitioners claim as "unsupported" is not only addressed in the Resolution, but is also well-supported in the administrative record (the "Record"). Consequently, these frivolous claims must fail as well.

4. Distorted and Imaginary Legal Requirements

Finally, Petitioners invent a number of legal requirements and prohibitions that they claim prevent the SUSMP from taking effect. These include claims that: (1) the Regional Board lacked the authority to adopt an SUSMP containing obligations beyond those included in the Permittees' proposed SUSMP; (2) the Regional Board does not have authority to require the Permittees to amend their municipal codes or to regulate real property; (3) the Regional Board cannot establish any specific standards because doing so would impinge on some minimum degree of flexibility guaranteed to the municipalities; (4) the Regional Board violated the California Environmental Quality Act ("CEQA") by not considering various potential negative impacts of the SUSMP; (5) the SUSMP constitutes an "unfunded mandate" in violation of the California Constitution; and finally (6) the SUSMP constitutes an underground regulation, in violation of provisions of the California Administrative Procedures Act. As discussed below, none of these "everything but the kitchen sink" claims withstands analysis.

5. Additional Demands

Petitioners have also requested a stay of the Regional Board's order adopting the SUSMP and related actions, and a hearing on their petitions. Both requests should be denied. The requests for stays were addressed in NRDC, Santa Monica BayKeeper, and Heal the Bay's April 28, 2000, Opposition to Request for Stay ("Stay Opposition"). Petitioners request for a hearing should be denied because the Petitioners have failed to provide either of the legally required elements: the

requisite statement of the evidence to be presented, or a satisfactory explanation for why such information was not provided previously, during the more-than-six-month period in which this extended process was played out.

II. STANDARD OF REVIEW

"[I]n order to uphold a Regional Board action, [the State Board] must be able to find that the action was based on substantial evidence." In the Matter of the Petition of Stinnes-Western Chem. Corp., WQ 86-16 (Sept. 18, 1986) at 16. The Stinnes-Western opinion upholds the regional board action in question as being "based on numerous facts and the record as a whole." Id. The State Board notes that the applicable standard requires "a search of the record for a 'reasonable factual basis.'" Id. at 17. Finally, it states that, just as the superior courts must defer to the water boards' expertise, the State Board must also "recognize the Regional Board's judgment in matters involving water resources and water quality." Id. at 18.

Thus, the State Board's role is not to decide how it would have acted if presented with the same facts, but to determine whether the Regional Board's action was supported by a reasonable factual basis.

III. SUBSTANTIAL PORTIONS OF THE PETITIONS ARE BARRED BY PETITIONERS' FAILURE TO EXHAUST ADMINISTRATIVE REMEDIES.

"The exhaustion of an administrative remedy has been held *jurisdictional* in California." 3 B.E. Witkin California Procedure (4th Ed. 1996) § 307 (emphasis in original). Notwithstanding this well-settled requirement – and the prolonged, nearly six-month-long period during which the SUSMP proposal was under active consideration by the Regional Board – Petitioners have submitted a set of legal arguments that contains many issues now raised for the first time. Compare "Objections to Proposed Regional Board Action regarding Standard Urban Storm Water Mitigation Plans (SUSMPs) – Order No. 96-054" (Ruttan & Tucker, December 22, 1999) ("Objections"), attached hereto as Exhibit H, to Consolidated Petitions of the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association. In fact, Petitioners essentially made only five legal arguments before the Regional Board (See Objections at 1) but now have employed a "kitchen sink" approach on appeal.

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This is grossly unfair. Petitioners should be barred from raising these arguments now. The State Board should summarily dismiss, on this basis alone, all arguments now advanced by the Petitioners that were not placed squarely before the Regional Board, through the aforementioned Objections, or in another competent manner. Without waiving this argument, we now address each of Petitioners' substantive arguments, in turn.

IV. ARGUMENT

A. The Regional Board Complied with All Requisite Procedures

Petitioners raise several interrelated procedural issues. In essence, their claims boil down to two basic questions: (1) Did the Regional Board have the authority to allow its staff to draft the SUSMP and to direct the Executive Officer to approve it? (2) Was the Regional Board allowed to make the changes that it made in the final days leading up to its adoption of the SUSMP? The answer to each of these questions is clearly "Yes."

1. The Regional Board was Fully Within its Rights in Ordering its Executive Officer to Adopt an SUSMP Based on the One Prepared by Regional Board Staff.

Petitioners make much of the "Administrative Review" procedure laid out in Part 2.I.G of the Permit. The Permit states that, "[f]or documents that require Executive Officer's approval, the Executive Officer will notify the . . . Permittee of the results of the review and approval or disapproval within 120 days." Permit, Part 2.I.G.1.a. The Permit designates the SUSMP as such a document – one to be submitted to the Executive Officer for approval. Part 2.III.A., Table 3.[5]

There is no doubt that the Regional Board complied with these provisions, in that it more than ensured the availability of the public participation opportunities that the administrative review procedure was designed to provide. Moreover, even if the SUSMP adoption process differed from

[5] The Permittees also refer to subsequent sections of the Permit, wherein it states that if the "Executive Officer determines that a Permittee's storm water program is insufficient . . ., the Executive Officer shall send a 'Notice of Intent to Meet and Confer (NIMC)' to the Permittee." Part 2.I.G.2. However, as the Permittees repeatedly point out, the provisions of Part 2.I.G.2 relate to enforcement actions by the Regional Board. See, e.g., Ps & As at 5 ("Executive Officer is prohibited from taking 'enforcement action again [sic] a Permittee until . . ."); Bellflower Petition at 11 ("The Executive Officer shall not take enforcement action against a Permittee until. . ."). As enforcement action is not at issue here, these provisions are irrelevant.

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the process outlined in the Permit in a substantive manner, the Board was not obliged as a matter of law to follow the precise procedure in the Permit.

a) The Board Complied with the Permit Procedure

The "Administrative Review process" on which the Petitioners' focus so much attention was established by the Board itself, as part of the Permit, to provide for stakeholder participation. There can be no doubt that the Board more than complied with the process, and provided ample opportunities for input. Furthermore, even for statutory directives, "substantial compliance is the governing test for determining whether statutory requirements have been met. [Citation omitted.] Strict compliance is required only when the intent of the statute can only be served by such a test." National Parks and Conservation Ass'n v. County of Riverside, 42 Cal. App. 4th, 1505, 1522 (1996).

The phrase substantial compliance "means 'actual compliance in respect to the substance essential to every reasonable objective' of the provisions." Tyler v. Children's Home Soc'y, 29 Cal. App. 4th 511, 540 (1995), citing Stasher v. Harger-Haldeman, 58 Cal. 2d 23, 28 (1962). Thus, even if the Administrative Review process purported to limit the Regional Board's discretion in implementing the Permit, and even assuming that the Permit provisions that the Board adopted could somehow have risen to the level of a statutory mandate (which they clearly do not), at most, the Regional Board was still required only to comply with the reasonable objectives behind those provisions.

The clear objective of the Administrative Review process was to guarantee stakeholder involvement in the process by which the remaining elements of the Permit were to be developed. Thus, it is worth taking a moment to review the process that the Regional Board employed, to allay any doubts regarding the extensive opportunities for stakeholder involvement.

The issue of the SUSMP first arose during the Regional Board's April 22, 1999 hearing. At that time, the Regional Board explicitly requested that the SUSMP be brought before it for review. See Exhibit I. There can be no question that the Board was authorized to make this request. To suggest otherwise would be to argue that the Regional Board irretrievably abdicated its power and duty to oversee the implementation of the Permit, and by extension, the Clean Water Act's NPDES

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permitting requirements, when it first assigned the Executive Officer responsibility for reviewing the SUSMP. That cannot be the case. See, e.g., Cal. Water Code § 13225; see also infra at 9.

The County released its initial proposal on May 20, 1999, and the Permittees submitted their official proposed SUSMP on July 21, 1999. However, prior to presenting that SUSMP to the Board, Regional Board staff ("Staff") held a workshop, in August of 1999, to give the Permittees an additional opportunity for input into the process. As a result of that workshop, an unusual step for the Regional Board, the Permittees retracted their proposal and submitted yet another revised version. Staff then presented that final proposal to the Board at the September 16, 1999 hearing, as directed. As is the case with any issue the Board asks Staff to bring before it, Staff made certain recommendations to the Board at the hearing. Nevertheless, the proposal that Staff presented was still the Permittees' proposal.

The Board took comments from dozens of interested parties at the September hearing. Based in large part on the extensive input it received from the Petitioners, the Board delayed its already-overdue decision so that Staff could go back and look at the issue in even greater detail. The Board also directed the Executive Officer to bring back a final proposal for a Board decision.[6] Staff then hosted a series of meetings with Permittees, and, after meeting with representatives of Petitioners over a four month period, the Board again took written and oral comments at the final Hearing, before adopting the SUSMP. Thus, the Board extended the review process and provided exceptional procedural process, over and above the normal requirements, in order to consider the concerns raised by the Petitioners.

Nothing in the Permit precluded the Regional Board from taking these steps. To the extent that the Permit did not specifically call for the extensive process that was followed, the decision to proceed in this manner was an appropriate exercise of the Regional Board's discretion to ensure adequate opportunities for public participation. In fact, it was an extraordinarily gracious gift to the

[6] Petitioners' claim that the Regional Board's action is invalid because the Executive Officer never formally disapproved their proposed SUSMP is hardly worth mentioning. Staff's official recommendation, and the subsequent course of events that transpired after the Permittees' submittal of their second proposed SUSMP, including the Board's direction to Staff to take charge of the matter, certainly constitutes a constructive, if a not formal, disapproval of the Permittees' proposal.

Permittees, in that, in order to accomplish it, the Board delayed an already-overdue program beyond the deadline in the Permit.

Moreover, the Permit explicitly provides for minor changes to its provisions. Permit, Part 3.I. Only "major revision[s] in the overall scope of the program . . . must be approved by the Regional Board as amendments to this Order." Id. Thus, even if the Regional Board's actions are viewed as a procedural change in the implementation of the Permit, they only added additional procedure, without violating any aspect of the Permit; and they certainly were not "a major revision in the overall scope of the program" requiring a formal amendment process. Id.

In sum, far from failing to provide for public participation, the Regional Board bent over backwards to ensure that stakeholders had an adequate opportunity to be heard, to the point of delaying Permit implementation considerably. The numerous meetings, hearings, workshops, and revisions that the Board provided clearly constituted compliance with the meet and confer provisions of the Permit, as well as with any other alleged procedural requirements, as all those steps enhanced public participation and clarity.

Furthermore, in adopting the Permit, the Regional Board could not have intended to require strict adherence to the process that Petitioners demand. This would be the ultimate elevation of form over substance, and could drag the process out forever, as it would require Staff to repeatedly reject proposed SUSMPs in the hopes that one would someday appear that met their specifications, rather than simply inserting the necessary minimum elements themselves. Such a process clearly would not have been acceptable. Given that this program was already substantially behind schedule, it was entirely appropriate for the Board to take charge of the development of the SUSMP in order to ensure that a system was in place to protect public health and the environment.

b) The Regional Board's Own Permit Could Not Limit the Board's Ability to Proceed in the Manner Necessary to Protect Public Health and the Environment.

To the extent that the Permit's Administrative Review process might purport to limit the Regional Board's powers by limiting the manner in which it implements aspects of the Permit left outstanding at the time the Permit was adopted, any such "apparent limitations" would be ineffectual. Agencies cannot, via issuance of permits, limit their own statutorily-defined authority,

and they cannot be estopped from performing their duties that are designed to protect the public. See, e.g., Smith v. Santa Barbara, 7 Cal. App. 4th 770, 775 (1992) (county *must* revoke land use permit, as "public entity may be estopped from enforcing the law only in extraordinary cases"); Morrison v. California Horse Racing Bd., 205 Cal. App. 3d 211, 218 (1988) (noting "public policy restraints on estopping the government"). Hence, even if one assumed that the Regional Board did depart in some substantial manner from the process outlined in the Permit (which it did not), it would have had the power to do so.

2. The Regional Board Did Not Violate Petitioners' Due Process or Notice and Comment Rights by Making Changes to the Proposal Before It.

Petitioners allege that the Regional Board deprived them of due process by making changes to the proposed SUSMP and not re-circulating the revised version for additional public comment. "Statement of Points and Authorities in Support of Legal Issues in Petition . . ." filed by the Cities of Bellflower, *et al.* ("Ps & As") at 3 and 12-13; "Petition for Review . . ." filed by the Cities of Bellflower, *et al.* ("Bellflower Petition") at 12 and 23-24; "Petition for Review of the [Regional Board's] January 26, 2000 Approval of the [SUSMP]," filed by WSPA ("WSPA Petition") at 4.[7]

In particular, Petitioners Cities of Bellflower, *et al.*, point to the Regional Board's setting of a deadline for the adoption of local ordinances, the fact that the final SUSMP was applied to non-discretionary projects as well as discretionary ones, and the removal of the proposed " 'roof top' exemption." Ps & As at 13; Bellflower Petition at 24. WSPA also complains of the "expansion of the definition of 'retail gasoline outlet' and the elimination of the credit for roofing surface area." WSPA Amendment to Petition at 2.

The simple answer to all of these claims is that the Regional Board may make any changes to the proposals before it that are logical outgrowths of the proposals, without having to recirculate the revisions for additional comments. See, e.g., United Steel Workers v. Marshall, 647 F.2d 1189,

[7] This pleading includes no references to the separate Petition for Review submitted by the City of Arcadia, as that petition references, "joins in," and "rel[ies] upon" the Bellflower Petition and its associated documents. Letter from Stephen P. Deitsch, Best Best & Krieger LLP, to State Water Resources Control Board re "Petition for Review of January 26, 2000 Action . . . and Actions and Failure to Act . . ." (Feb. 25, 2000) at 1-2.

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1222 (D.C. Cir. 1980), cert. denied, 101 S. Ct. 3149 (1981) (upholding as a "logical outgrowth" the agencies' decision to lower health standard from 150 $\mu g/m^3$ to 50 $\mu g/m^3$, when 100 $\mu g/m^3$ was the noticed proposal). "A contrary rule would lead to the absurdity that ... the agency can learn from the comments on its proposals only at the peril of starting a new procedural round of commentary." International Harvester Co. v. Ruckelshaus, 478 F. 2d 615, 632, n.51 (D.C. Cir 1973).

It should have been clear to the Petitioners that the Regional Board was in fact considering the precise sorts of changes the Petitioners are now challenging, as all of these changes were logical outgrowths of the various comments and proposals that were circulated over the six months leading up to the Regional Board's final action at the January 26, 2000 Hearing. In fact, most of these issues were not only "logical outgrowths" of previous proposals, but were explicitly discussed at various points throughout the process. Indeed, in many cases, the Board's changes simply reinstated conditions that had been previously considered by the Regional Board at the September, 1999 hearing.

With respect to the requirement for local ordinances, for example, the original Permit has an entire section requiring Permittees to secure legal authority to implement the requirements imposed by the Permit and its various programs, and to show that they have done so. Permit, Part 2.I.E. Thus, the Permittees should have known they would be responsible for demonstrating the legal authority to implement the SUSMPs. By requiring the municipalities to adopt an ordinance within six months of SUSMP adoption, all the Board did was clarify a time-line for that to occur. The establishment of the timeframe for a requirement that was already forecast is necessarily a logical outgrowth of the requirement itself. Indeed, how else would the board implement the provision?

The removal of the roof-top exemption was also clearly appropriate without another round of notice and comment. As a point of reference, this exemption was added by the Executive Officer after the original Board hearing in September, 1999. Until the Board released its December 7, 1999, proposal, no such exemption had ever been discussed. Taking this novel exemption back out, thus making the SUSMP more like the Permittees' original proposal, and more like the proposal that was before the Board in September of 1999, was certainly a logical outgrowth of the process. Moreover, the fact that its removal was recognized as a strong possibility is evident in the

fact that several of the Petitioners sent in comment letters specifically supporting its inclusion and advocating for its retention.[8] Yet another round of comments on this would have been pointless.

Petitioners also complain about the application of the SUSMP to non-discretionary projects, yet the question of whether the development planning program should apply to non-discretionary projects as well as discretionary ones was at issue as far back as January of 1999. See, e.g., Letter from Alex Helperin, NRDC to Dennis Dickerson, Regional Board (Jan. 8, 1999), attached hereto as Exhibit K. Furthermore, the scope of projects to which the SUSMP would apply has been an issue from the beginning, and many of the Petitioners have shown their awareness of it by raising the issue in their comment letters. See, e.g., Letter from Samuel Wilson, Director of Community Services & Water, Vernon, to Dennis Dickerson (Jan. 14, 2000) at 3, attached hereto as Exhibit L.[9]

Finally, as to WSPA's claim about the definition of "retail gasoline outlet," what WSPA fails to mention is that one of the central reasons for its presence at both hearings was its concern over the applicability of the SUSMPs to retail gas stations. Thus, they were clearly aware that it was well within the scope of possibilities for the Regional Board to take the action that it took. The issue of how to define "Retail Gasoline Outlet" was also raised by various Petitioners prior to the Hearing. See, e.g., Exhibit J at 4.

In sum, the modifications to the SUSMP in the final days leading up to the Hearing, and the changes made by the Board at the Hearing itself, were all fully within the scope of the sorts of items already being discussed, and, as such, were all logical outgrowths of existing proposals. The

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[8] See, e.g., Letter from Rufus C. Young, Jr., Burke, Williams & Sorensen, LLP (on behalf of, among others, Petitioners the Cities of Compton and Industry) to Dennis Dickerson, Executive Officer, Regional Board (Jan. 5, 2000) at 2, attached hereto as Exhibit J.

[9] The cases cited by Petitioner Cities of Bellflower, *et al.*, are inapposite. They involve situations where a party was affirmatively "denied the opportunity to present evidence," Bank of America v. Long Beach, 50 Cal. App. 3d 882, 886 (1975), and where evidence was withheld until "five minutes before the last hearing." Id. at 888. Such was not the case here, as there is no claim that any party was denied an opportunity to present evidence, and the changes implemented at, and just prior to, the final Hearing were logical outgrowths of the existing proposals, not new evidence. Similarly in English v. Long Beach, 35 Cal. 2d 155 (1950), the issue was whether "petitioner was deprived of a fair hearing because the board in reaching its decision relied upon evidence taken outside the hearing." Id. at 156-157. No such issues are presented here.

Board was therefore under no obligation to recirculate yet another revised proposed SUSMP, and the Petitioners' due process and notice and comment rights were in no way compromised.

B. Previous Regional Board Resolutions and Orders Did Not Limit the Regional Board's Discretion in Reviewing and Adopting the SUSMP.

1. The Regional Board in No Way Limited its Discretion Over SUSMP-Approval In Approving the List of Applicable BMPs

Petitioners assert the frivolous argument that the Regional Board, in approving the "master list of BMPs," thereby decreed that any manner of implementation of those BMPs would suffice, and that no further requirements were necessary or even could be imposed. Ps & As at 6; Bellflower Petition at 9. This contention dramatically twists the Board's process and clear intent.

The Regional Board was required to approve a list of BMPs prior to approving the SUSMP. Permit Part 2.III.A.1.b. and c. Furthermore, in order to approve that list of BMPs, the Regional Board had to find, and in fact did find, that the BMPs it was approving, "when implemented at development projects . . . [would] reduce pollutants in storm water dischargers to the 'maximum extent practicable'." LA-RWQCB Res. No. 99-03, Finding 4; see 33 U.S.C. § 1342(p)(3)(B)(iii). That statement by the Regional Board in no way relinquished its ability to specify how or where those BMPs must be installed, as all parties understood. Indeed, the Permit makes clear that the SUSMP was still to come, Permit, Part 2.III.A.1.c., and its fundamental purpose was to provide greater clarity as to which BMPs were most appropriate for which types of projects. See also the discussion on page 10, above, regarding an agency's ability to limit its own powers.

The bottom line is that, in order to function as intended, BMPs must be installed correctly; appropriate BMPs must be installed at each site, based on the unique conditions of the site; they must be maintained; and as the Regional Board noted, they must be of large enough to be effective. R-00-02, Finding 10. It is simply nonsensical to suggest that, in adopting the BMPs, the Regional Board forsook its ability to impose any further conditions on those BMPs. Petitioners' logic would imply that one could choose the wrong BMP for a site, make it too small, install it incorrectly, and fail to maintain it, and the Regional Board would be powerless to object because its had found that BMP to meet the "maximum extent practicable" (or "MEP") standard. That cannot be right.

2. Far From Precluding the SUSMP, the Permit Mandates Just the Sort of Program the SUSMP Implements.

Petitioners claim that the Permit itself limits the Regional Board's authority. Ps & As at 3; Bellflower Petition at 16. They claim, for example, that the Permit precluded the Regional Board from imposing requirements on "non-discretionary" projects, and that the Regional Board's inclusion of additional categories of development – beyond those explicitly listed in the Permit – is illegal. Id.

Not only does the language in the Permit not limit the Regional Board's ability to expand the scope of the SUSMP, but it explicitly envisions that the Board may go further. Petitioners once again fail to cite to the Permit, quite possibly because the reader would see that the Permit says:

> "**At the minimum**, SUSMPs and guidelines shall be prepared for the following development categories:"

Permit, Part 2.III.A.1.c. (emphasis added). Thus, the Permit was explicitly designed to create minimum standards, and the Regional Board was well within its rights to go beyond the categories listed in the Permit. The Regional Board recognized, and explicitly relied upon, this fact in applying the SUSMP to additional categories of development, and in concluding, for example, that it would make no sense to limit the SUSMP to discretionary projects. R-00-02, Finding 13.

C. The Regional Board's Findings Were More Than Adequate as a Basis for its Action and Well-Supported by the Administrative Record.

Petitioners reference three issues that they claim should have been addressed in official Regional Board "findings" prior to the adoption of the SUSMP. They say that "the Regional Board SUSMP was adopted without evidence or findings showing that it would improve water quality, that it is cost effective, or even that it will 'reduce the discharge of pollutants to the maximum extent practicable.'" Ps & As at 4. However, each of these issues is addressed in the Regional Board's findings and is supported by substantial evidence in the Record. Furthermore, Petitioners fail to justify why these issues must be addressed in the first place.

1. Improvements to Water Quality

Petitioners claim that the Regional Board adopted the SUSMP "without evidence or findings showing that it would improve water quality." Ps & As at 4; see also Bellflower Petition

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at 19. To the contrary, the Regional Board made explicit findings that urban runoff carries pollutants to local waterways, and that the use of BMPs can limit that transport process. See R-00-02, Findings 5-7. It also recognized that "the ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time," and that the minimum volumetric performance level adopted by the Regional Board for the sizing of BMPs is beneficial because it will ensure the capture of the majority of pollutants. Id., Findings 10 and 11. Thus, Petitioners' claims that these issues were not addressed by the Regional Board are simply wrong.

Moreover, there was an enormous – perhaps unprecedented – amount of evidence in the Record to support these findings. See, e.g., Letter from NRDC, Santa Monica BayKeeper, and Heal the Bay to the Regional Board (Jan. 14, 2000), attached hereto as Exhibit M, at 15-17. As noted above, the State Board is to uphold the actions of a regional board if those actions were "based on substantial evidence" or the Record shows any "reasonable factual basis" for them. WQ 86-16 at 16. Here, the Regional Board's action was based on overwhelming evidence, and thus, its actions were not only valid, but necessary.

2. Cost-Effectiveness

Petitioners claim that the SUSMP was adopted without evidence or findings to show that it is cost-effective. Ps & As at 7-8; Bellflower Petition at 17-19. However, once again, the Regional Board included a specific finding that "BMPs can be 'designed-into' a project in a cost effective way," R-00-02, Finding 8, see also Findings 9-11, and the SUSMP was designed specifically to accomplish that purpose.

Furthermore, these findings were well-supported by the Record, including (1) the Regional Board's own empirical analyses of the costs of implementing the SUSMP in various real-world situations (itself a rare step for any regional board to take), (2) extensive testimony at the hearings regarding cost issues, and (3) other documents submitted as part of the Record. See, e.g., Exhibit M at 17-19. In fact, as is discussed in detail in the Stay Opposition, the documentation in the Record uniformly demonstrates that, contrary to the Petitioners' claims of great expense, the costs to implement the SUSMP will be quite minor.

Finally, this is an example of an area where Petitioners complain of the absence of an analysis that is not even required. The MEP standard is the applicable standard for the municipal stormwater management program, and the fact that dozens of areas around the country already implement more stringent programs than the one outlined in the SUSMP, see Exhibit M at 12-14, in and of itself, should suffice to show that the SUSMP is practicable. It is not necessary to show that the specific costs outweigh the benefits in order to adopt the SUSMP.[10]

3. Reduction in Pollutants to the Maximum Extent Practicable

Petitioners claim that the SUSMP has not been proven to reduce pollutants to the maximum extent practicable, as required by the Clean Water Act. Ps & As at 4 and 8; Bellflower Petition at 19-20.[11] This flies directly in the face of their statement, in another context, that the Board already determined that any implementation of the BMPs would satisfy the MEP standard. See Bellflower Petition at 9, citing LA-RWQCB Res. No. 99-03, Finding 4. Further, the Regional Board's findings

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[10] Petitioners also argue for a substantive legal requirement, based on the Clean Water Act ("CWA"), its regulations, and the Porter-Cologne Act, requiring the Regional Board to perform a cost-benefit analysis prior to adopting the SUSMP. Ps & As at 7-8; Bellflower Petition at 17-19; see also WSPA Petition at 3. However, they are unable to cite to anything to support this novel claim. Their only CWA-related reference is to a statement from the Federal Register regarding President Clinton's non-regulatory Clean Water Initiative, which is explicitly described as a "proposal." Bellflower Petition at 17. Furthermore, the Clean Water Initiative did not propose a cost-benefit analysis, *per se*, but rather, "taking into account cost considerations as well as water quality effects." 64 Fed. Reg. 68722, 68732 (Dec. 8, 1999). The Regional Board did this. See above and Exhibit M at 15-19. Finally, Petitioners neglect to mention that the first part of the proposal suggests "establishing a phased compliance. . . approach for discharges from municipal separate storm sewer systems with priority on controlling discharges from municipal growth and development areas." Id. (emphasis added), which is exactly what the SUSMP does.

With respect to the Porter-Cologne Act, Petitioners cite to four statutory sections, two of which *allow* the State Board and regional boards to request analyses of water quality where a cost-benefit analysis supports doing so, Cal. Water Code §§ 13165 and 13225, and one of which relates only to the creation of water quality objectives. Id. at § 13241. Since the Regional Board was neither requesting such an analysis nor creating water quality objectives in adopting the SUSMP, these citations are totally irrelevant. (WSPA also cites to Water Code section 13263(a), but its only reference to economics is an implicit one, by virtue of its reference to section 13241, discussed above.) Finally, Petitioners cite to one line in the Permit, which – far from requiring a cost-benefit analysis prior to adopting the SUSMP – requires a developer information program to inform developers about "cost effective storm water pollution control measures." Permit Part 2.III.A.4.c.

[11] Petitioners also complain that the Regional Board did not assess the *Permittees'* proposed SUSMP to determine whether *it* would meet the MEP standard. Bellflower Petition at 15. Of course, this is irrelevant, as the Regional Board's duty is to identify and adopt the most appropriate plan; it is not limited by any requirement to adopt the first plan that crosses its desk and satisfies the MEP standard.

collectively support the reasonableness and practicability of the SUSMP. R-00-02, Findings 7-14. In short, this issue was considered and the Regional Board did make the appropriate findings.

Moreover, it is unclear what Petitioners seek to accomplish with this argument. If they are arguing that the SUSMP has not been "proven" to entirely satisfy the MEP standard, that argues in favor of adopting additional and/or more stringent restrictions, not for reverting to a *less* stringent program. By going further than the Permittees' proposed SUSMP, the Regional Board necessarily came closer to the standard than it would have if it approved the Permittees' proposed SUSMP. Thus, it was required to adopt its version of the version proffered by the Permittees.

If, on the other hand, Petitioners are arguing that the SUSMP exceeds the MEP standard in that it is impracticable, query why the Petitioners present no information regarding its practicability. It is, after all, the Petitioners burden to show that the SUSMP is impracticable. This is especially true given that the Board found that the SUSMP is practicable. See R-00-02, Findings 8-11.

D. Legal Arguments

Petitioners raise a series of legal arguments that are either distortions of existing law or inventions that do not reflect anything in existing law. We address each of these meritless claims in turn, below.

1. The Regional Board Was Not Limited by the Terms of the SUSMP Proposed by the Petitioner/Permittees

Petitioners make the bizarre argument that the Regional Board exceeded its authority precisely because it adopted an SUSMP that included obligations not listed in the Permittees' proposed SUSMP. Ps & As at 3; Bellflower Petition at 13. Of course, the entire purpose of Regional Board review of Permittees' submittals is to give the Regional Board the opportunity to demand more and/or different things from the Permittees than that which the Permittees might voluntarily suggest. Thus, this argument makes no sense, except as an expression of hubris, and perhaps that explains why the Petitioners cite no law in support of this claim.

2. The Regional Board Has the Authority to Impose Requirements that Necessitate Modifications to Municipal Codes.

In their amended petition, the Cities of Bellflower, *et al.*, raise, for the first time, an objection to the requirement that the Permittees amend their municipal codes as necessary to implement the SUSMP. Amended Petition for Review submitted by the Cities of Bellflower, *et al.*, (Apr. 6, 2000) ("Bellflower 2") at 3. As is explained above, see section III, Petitioners cannot raise issues for the first time on review. However, even beyond their failure to raise this issue below, it is simply inaccurate to contend that the Regional Board lacks authority to require the Permittees to take steps to add any necessary legal authority to be able to implement the Permit, including the SUSMP, and to do so by a certain date. The Permit has an entire section requiring Permittees to secure legal authority to implement the requirements of the Permit, and to show that they have done so, Permit, Part 2.I.E., and the regulations promulgated under the federal Clean Water Act ("CWA") explicitly mention this mandate. 40 C.F.R. § 122.26(d)(2(i). Moreover, the Regional Board has inherent authority to require the Permittees to take whatever steps are necessary to ensure the implementation of the BMPs the Board deems necessary to protect the region's waters. See Cal. Water Code §§ 13377, 74 ("regional boards shall, as required or authorized by the [CWA], issue [permits] which apply and ensure compliance with all applicable provisions of the act.")

3. The Regional Board Has the Authority to Impose Requirements on the Permittees Related to the Control of Real Property.

Petitioners also argue for the first time in Bellflower 2 that the Regional Board lacks the authority to impose requirements regarding responsibility for maintenance of the BMPs, and for the transfer of such responsibility with the transfer of property. Id. at 4-5. They claim that the Regional Board has no authority to impose such requirements and that the requirements "may result in a violation of State and Federal law," subject the Permittees to civil damage claims, and infringe on their police powers. Id.

Petitioners do not cite a single statute, case, or other authority for this "parade of horrors" they predict. While Petitioners have failed to disclose what laws they feel will be violated, how they would be subject to liability, or how their police powers would be affected, it is clear that they are substantively wrong about these claims. As a state agency assigned the responsibility to

implement federal law, there is no reason why the Regional Board could not require its municipal Permittees to require developers to include certain conditions in the title to their property, or otherwise regulate the management of property in the public interest. Again, the Permit explicitly requires "each Permittee [to] demonstrate that it possesses the legal authority necessary," Permit, Part 2.E.1, as do the regulations, 40 C.F.R. § 122.26(d)(2(i), and it is therefore explicitly contemplated that there may have to be an enhancement of existing authority.

4. The Regional Board Was Not Required to Undertake Any Formal Assessments of the Sorts Petitioners Allege Were Required Prior to Adopting the SUSMP.

Petitioners argue that the SUSMP will have ancillary negative impacts on things such as groundwater protection and pest control, will create nuisances and liabilities, and that the Regional Board failed to analyze those issues. Ps & As at 7 n.3; Bellflower Petition at 19-20. However, they completely fail to meet their burden, as they cannot even establish the existence of the alleged requirements to assess these specific issues. The only citation they provide for any of these issues is Water Code section 13241, which relates only to the establishment of water quality objectives. Since the creation of water quality objectives was not at issue in the adoption of the SUSMP, this citation is irrelevant, and Petitioners charges have absolutely no basis or merit.

Furthermore, even though not required, some, if not all, of these issues were considered by the Regional Board. With respect to Petitioners' concern for groundwater protection, for example, the Regional Board included a specific exemption in the SUSMP to avoid infiltration in situations where groundwater resources would be placed at risk. See SUSMP Requirement 11 (Waiver). Similarly, because the Regional Board has not mandated that any specific structural BMP(s) must be used in an individual development in meeting the volumetric performance level, the developers and the Permittees can choose those BMPs that minimize any of the issues that may be of concern to them. Finally, the information submitted to the Record showed that similar programs are already underway all across the country. See Exhibit M at 12-14.

5. The Regional Board Was Not Required to Walk the Permittees Through the Implementation Process Prior to Adopting the SUSMP

Petitioners complain that the Regional Board "provided no direction on how the Permittees were to proceed with the implementation of the mandated . . . SUSMP, how such programs could lawfully and reasonably and practicably be incorporated into existing Permittees' Codes . . . and how such . . . codes could realistically be properly reviewed, revised, and implemented throughout the entire County, within six (6) months." Bellflower Petition at 20. The Regional Board was under no obligation to explain to the Permittees how to implement the mandates of the SUSMP within their respective municipal systems. Had the Regional Board done so, the Petitioners would no doubt be complaining about the intrusion on their autonomy. The Regional Board exercised its judgment appropriately and provided a full half-year – despite the fact that the SUSMP is already over a year overdue, see page 2, above – for the Permittees to comply. This is not even a colorable claim regarding the legitimacy of the SUSMP.

6. Neither Water Code 13360, Nor Any Other Provision of Law Cited by the Petitioners, Prohibits the Regional Board from Adopting Specific Criteria for the Control of Municipal Stormwater from Development.

Petitioners argue that the cities should be given flexibility in deciding which BMPs to use. Bellflower Petition at 15-16; WSPA Petition at 3. In fact, they have been given such flexibility. The Regional Board approved a list of literally dozens of different BMPs from which developers and municipal Permittees may choose for any given project. See LA-RWQCB Res. No. 99-03, attached hereto as Exhibit N.

Petitioners further argue, without any support or explanation whatsoever, that the SUSMP requirements mandate a specific manner of compliance, and therefore violate Water Code section 13360. Ps & As at 8; Bellflower Petition at 21. This is untrue for two separate reasons. First, the SUSMP does not mandate any specific manner of compliance with a discharge limit, as prohibited by Section 13360,[12] but is itself an independent compilation of mandatory BMPs and a required performance level for them, unrelated to any discharge limit. Second, even if the SUSMP were to violate Section 13360 – which it does not – the federal Clean Water Act pre-empts such a state law.

[12] All further section references are to the California Water Code, unless otherwise noted.

a) The SUSMP Does Not Dictate How to Comply With a Discharge Limit, But Is an Independent Compilation of Required BMPs and a Sizing Component to Ensure Their Adequate Performance

Section 13360 states that no waste discharge requirement or other order of a regional board "shall specify the design, location, type of construction, or particular manner in which compliance may be had with that requirement, order or decree, and the person so ordered shall be permitted to comply with the order in any lawful manner." Cal. Water Code § 13360. As interpreted by the California Court of Appeal in Tahoe-Sierra Preservation Council v. State Water Resources Control Bd., this means that the Regional Board "may not prescribe the manner in which compliance may be achieved with a discharge standard." 210 Cal. App. 3d 1421, 1438 (1989). The SUSMP at issue in this case does not specify how one is to comply with any "discharge standard." In fact, it is totally independent of any discharge standard; it is a separately-mandated array of BMPs to control runoff from new and redevelopment projects, coupled with a sizing specification to ensure that the BMPs function at an adequate level of performance. The Regional Board has not provided any "discharge standard" – i.e., mandatory level of effluent quality – associated with the SUSMP.

Indeed, the numerical performance level in the SUSMP is similar to the runoff limits for new development upheld by Tahoe-Sierra. In that case, plaintiffs challenged certain provisions of the Lake Tahoe Basin Water Quality Plan that established limits on new development to control runoff. Specifically, the provisions (a) established limits on land coverage for new development in certain designated areas, and (b) prohibited water runoff from new development above that level which would occur if the established land coverage standards were met. The Court of Appeal upheld both the standard and the prohibition on the basis that the Basin Plan did not preclude any means of compliance with the runoff limitation and therefore it did not improperly specify the particular manner of compliance.

Like the volumetric runoff limit in Tahoe-Sierra, the SUSMP establishes a volumetric benchmark for stormwater control, leaving the actual manner of compliance to the individual cities and/or development projects. In fact, the SUSMP's volumetric specification is far more flexible than the runoff standard at issue in Tahoe-Sierra, because (1) in that case, there was arguably only

one practicable way to comply with the standard,[13] and (2) it truly was a discharge "standard," in that it limited the volume of allowable stormwater runoff, rather than a specification of a minimum performance level for required structural devices.

Further, the performance level at issue here requires that whatever post-construction structural BMPs are used,[14] they be sized so as to mitigate storm water runoff from either (1) the 85th percentile 24-hour runoff event; (2) the volume of annual runoff to achieve 80 percent or more volume treatment; (3) the volume of runoff from a .75 inch storm event; or (4) the volume of runoff produced by a 24-hour rainfall criterion for treatment that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event. In addition, the BMPs must control peak flow discharge to provide stream channel and over bank flood protection. See SUSMP (March 8, 2000).

From the plain reading of this provision, it is clear that it does not prescribe the design, location, type of construction, or particular manner in which compliance may be had with any

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[13] The Court in Sierra-Tahoe also noted that "if under present conditions of knowledge and technology, there is only one manner in which compliance may be achieved, that is of no moment" and there is no violation of section 13360. Sierra-Tahoe, at 1438; see also Pacific Water Conditioning Assoc., Inc. v. City Council, 73 Cal. App. 3d 546 (1977) (holding no violation of section 13360 because the sole manner of compliance was prescribed by the circumstances, not by the order). Thus, a lack of a variety of technological means to comply with a performance level does not transform it into a prescription for the means of compliance – even if such circumstances existed here.

[14] The requirements imposed by the SUSMP are of two types: (1) the BMPs, and (2) the required numerical/volumetric performance level for those BMPs. The essence of the petitions before the State Board is a challenge to the latter. Petitioners rest their contention that the SUSMP constitutes a "discharge standard" on their claim that the SUSMP "mandates the implementation of a specific Numerical Mitigation Standard and specific design standards to be complied with." Bellflower Petition at 21, ¶ 63. Of course, as indicated above, these are not numerical discharge standards, as even some of the Petitioners recognize. See, e.g., Letter from Elroy Kiepke, City Engineer, City of La Cañada Flintridge, to Dennis Dickerson, Regional Board (Dec. 21, 1999), included in the Record, at 1.

However, even if Petitioners did intend to challenge the BMPs themselves, they are no longer permitted to do so, as the BMPs were approved by the Regional Board over a year ago. See Exhibit N. Moreover, the wealth of BMPs available would defeat any claim that the Board dictated the manner of compliance. See note 16. Finally, Petitioners never objected to the BMPs when they were approved, and in fact, many were supportive. In fact, the BMPs in the SUSMP impose the exact same requirements (with the exception of seven substantially similar requirements added by the Regional Board) proposed by the County of Los Angeles, with the support and approval of the rest of the Permittees, in their August 11, 1999, draft SUSMP. Compare Final SUSMP to Ps & As Exhibit A. It was not until the SUSMP was issued, with its volumetric specification for the performance of those BMPs, that the Permittees voiced any opposition.

standard. Instead, the Permittees are free to choose any one of the four numeric levels provided in the SUSMP. Moreover, the Permittees are free to choose the method or manner of compliance and the BMPs to which it will be applied, from a lengthy list of approved BMPs.[15] Finally, the State Board has found that there is no violation of Section 13360 if an order allows a discharger to select from a number of permissible alternatives for achieving compliance with a standard.[16] Thus, it is clear that the SUSMP's numerical specifications do not violate Section 13360.

b) The Federal Clean Water Act Requires the Use of BMPs and Pre-Empts Any State Law in Conflict With That Requirement.

Even assuming, *arguendo*, that the SUSMP violated Section 13360, it would be permissible under other sections of the Water Code. Water Code Section 13377 provides that, notwithstanding any other provision of the Porter-Cologne Act, the State and Regional Boards shall issue NPDES permits as required or authorized by the CWA to ensure compliance with all applicable provisions of the Act. See Cal. Water Code § 13377.

Under the CWA, the Administrator of the United States Environmental Protection Agency ("EPA"), and authorized states, are authorized to issue permits that include any conditions deemed necessary to carry out the provisions of the Act. 33 U.S.C. § 1342(a)(1); NRDC v. Costle, 568 F.2d 1369 (D.C. Cir. 1977). Moreover, CWA section 402(p)(3) actually requires municipal storm water NPDES permits to "require controls . . . including **management practices [BMPs], control techniques and system, design and engineering methods** . . . as . . . appropriate for the control of such pollutants." 33 U.S.C. § 1342(p)(3)(B) (emphasis added).

Further, EPA regulations authorize NPDES permits to require BMPs where reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and extent of the Act. 40 C.F.R. § 122.44(k). BMPs are defined to include "schedules of activities, prohibitions

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[15] See LA-RWQCB Res. No. 99-03, attached hereto as Exhibit N; Final SUSMP, Table 2 (highlighting the litany of options available).

[16] In the Matter of the Petition of Citizens for a Better Environment, *et al.* for Review of Action and Inaction of San Francisco Regional Water Quality Control Board, State Water Resources Control Board Order No. WQ 90-5 (finding that Cease and Desist Order did not violate Section 13360 because it allowed the dischargers to select the manner of compliance from permissible alternatives specified in the Order)

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of practices, maintenance procedures, and other management practices to prevent or reduce pollution of 'waters of the United States.' BMPs also include treatment requirements, **operating procedures**, and practices to control plant site runoff . . ." 40 C.F.R. § 122.2 (emphasis added).[17]

Because the CWA authorizes, and indeed requires, the imposition of BMPs in NPDES permits, the Porter-Cologne Act gives the Regional Boards the same authority, via Section 13377.[18] To the extent that these requirements are inconsistent with Section 13360, the authority of the regional boards to implement Section 13377 prevails.[19]

Thus, it is clear that the Regional Board is authorized under the federal Clean Water Act to set forth specific BMPs where necessary to achieve standards.[20] In this case, specific BMPs are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and extent of the Act. 40 C.F.R. § 122.44(k).

In sum, neither the volumetric performance level nor the narrative BMPs violate Water Code Section 13360.

7. The Regional Board did Not Violate CEQA Because the Adoption of the SUSMP Was Exempt from CEQA Requirements.

Petitioners claim that the Regional Board violated the California Environmental Quality Act ("CEQA"), Cal. Pub. Res. Code §§ 21000 *et seq.*, by failing to consider the potential environmental impacts from the adoption of the SUSMP. Ps & As at 11-12; Bellflower Petition at 23; WSPA Petition at 4-5. Petitioners acknowledge that the Board found its actions to be exempt from CEQA pursuant to Water Code section 13389. However, Petitioners City of Bellflower, *et al* , note that Section 13389 only exempts the adoption of waste discharge requirements ("WDRs"), Ps & As at

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[17] 40 C.F.R. section 122.1 explicitly includes discharges of storm water as a category of point sources requiring NPDES permits; thus the requirements of Part 122 of the Code of Federal Regulations apply to municipal storm water permit requirements.

[18] See In the Matter of the Petitions of Las Virgenes Municipal Water District et al., State Water Resources Control Board Order No. WQ 80-19 at 20-21 (Nov. 20, 1980); see also In the Matter of the Petition of the Dept. of Parks and Recreation, State Water Resources Control Board Order No. WQ 82-15 at 14 (Oct. 21, 1982)

[19] Id.

[20] See also Defenders of Wildlife v. Browner, 191 F.3d 1159, 1161 and 1166-67 (9th Cir. 1999) (upholding the inclusion of specific structural BMPs in a municipal storm water permit).

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12, and WSPA argues that it applies only to the adoption of "federally-mandated waste discharge requirements and permits." WSPA Petition at 5. Because the SUSMP is part of a WDR (as is explained below) and is federally mandated (as explained in the prior section and below), its adoption was not subject to CEQA.

a) The SUSMP Is an Element of a Waste Discharge Requirement

The SUSMP is an explicit part of the Permit. Part 2.III.A.1.c. Since the Permit is, on its very face, denominated a WDR, the SUSMP is also part of a WDR. See also 14 C.C.R. § 15263 (the CEQA exemption for WDRs applies to NPDES permits); Cal. Water Code § 13374 (same). Thus, even if the exemption in Section 13389 is limited to the adoption of WDRs, it applies to the whole of the Permit, including the SUSMP, which is thus exempt from CEQA.

Furthermore, viewing NPDES permits (and the SUSMP) as WDRs for purposes of CEQA review was affirmed in Pacific Water Conditioning Ass'n v. City Council, 73 Cal. App. 3d 546 (1977). The court explained that the exemption in Section 13389 is not merely an administrative concession to regional boards who only have 120 days to issue WDRs after receiving a report of intended discharge, but rather, is part of the Porter-Cologne Act ordained specifically to allow the State to administer the NPDES program. Id. at 556. The court states that "[i]t is fairly apparent that the exemption for the promulgation of waste discharge requirements from CEQA contained in Water Code Section 13389 was meant to parallel the exemption for the issuance of NPDES permits from the requirements of NEPA found in Section 1371 of the federal act." Id. at 556. Thus, the fact that the SUSMPs were not separately "agendized" or "noticed" as WDRs is irrelevant, as the whole of the Permit is exempt from CEQA pursuant to Section 13389.

b) The Requirement for BMPs Is Federally Mandated, and Defenders of Wildlife Does Not Negate that Requirement or Make it Discretionary.

As is explained in section IV.D.6.b), above, the implementation of BMPs is mandated by the CWA. WSPA argues that CEQA applies because the "proposed numerical design standards are not federally required." Id. at 4-5.[21] In support of its claim that the SUSMP is "not federally

[21] A general explanation of why the SUSMP was federally mandated is provided above, at pages 23-23. Here, we specifically address WSPA's invocation of Defenders of Wildlife.

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required," WSPA states that the CWA does not require compliance with "numeric limitations," and it cites to Defenders of Wildlife v. Browner. Id. at 5, lines 5-6. This statement reveals WSPA's fundamental misunderstanding both of the SUSMP and the CWA.

Defenders of Wildlife addressed the question of whether CWA section 402(p) requires the establishment of water quality-based, numeric effluent limits for municipal stormwater discharges. The SUSMP is not a numeric limit, but a minimum performance level established to satisfy the MEP requirement. Nowhere in the SUSMP does it set forth any numerical discharge limitation, either in terms of a maximum volume or pollutant concentration. The numerical specification in the SUSMP is for the sizing BMPs; it establishes no limits on the nature of the eventual discharge. Moreover, even if the SUSMP did include numeric pollution limits, it was not designed in reference to applicable water quality standards, which was the issue in the Defenders of Wildlife case. Thus, that case is irrelevant.[22] What the SUSMP is designed in reference to is the MEP standard, which is mandated by the CWA. See section IV.D.6.b), above; Defenders of Wildlife, 191 F.3d 1159, 1164 (1999). Thus, the SUSMP is the direct result of a CWA mandate, and it is exempt from the requirements of CEQA. By WSPA's logic, requiring that storm drains be cleaned "annually" would be a "numeric limit."

Finally, WSPA mistakenly applies Committee for a Progressive Gilroy v. State Water Resources Control Bd., 192 Cal. App. 3d 847 (1987), to claim that the CEQA exemption of Section 13389 is not applicable to SUSMPs. WSPA Petition at 5. Gilroy is not applicable to the case at hand because the challenged orders in Gilroy were issued under the exclusive authority of the Porter-Cologne Act, and not under the CWA, as the SUSMP was. Id. at 862. As the Gilroy court

[22] The CWA creates a two-pronged system for water quality control. That system imposes both technology-based standards and water quality-based standards. The SUSMP is a technology-based standard. It is based on existing technology and the requirement to control the discharge of pollutants to the MEP standard; it is not designed to ensure achievement of water quality standards. Defenders of Wildlife, on the other hand, involved a dispute over whether municipal stormwater permits had to include numeric effluent limits to meet water quality standards. As indicated above, see footnote 20, Defenders explicitly upheld the imposition of BMPs, as in the SUSMP. Thus, its holding regarding numeric effluent limits is irrelevant to the current dispute.

points out, Section 13372 limits the exemption of Section 13389 to those actions "required under the [CWA]." As is explained above, the SUSMP was a CWA requirement.[23]

In sum, the SUSMP, as a part of a federally-mandated municipal stormwater permit, is both a WDR and federally-mandated, and thus, is exempt from CEQA pursuant to Section 13389.

8. The SUSMP Is Not an "Unfunded Mandate" in Violation of the California Constitution Because it is Part of an NPDES Permit.

Petitioners argue that the SUSMP constitutes an "unfunded mandate" prohibited by the California Constitution, Article XIII.B Section 6. WSPA Petition at 6, Ps & As at 9-10; Bellflower Petition at 21-22. The referenced provision of the Constitution requires state subvention of funds to reimburse local governments when the legislature or a state agency mandates a new program or higher level of service on local agencies.[24] Accordingly, state subvention is not required when the federal government imposes the costs of a new program or higher level of service. Cal. Const. Art. XIII.B, § 6; Hayes v. Commission on State Mandates, 11 Cal. App. 4th 1564, 1581 (1992).

The state Legislature enacted Part 7, within Division 4 of Title 2 of the Government Code, Cal. Gov't Code §§ 17500 *et seq.*, to implement the provisions of the California Constitution at issue.[25] Part 7 defines the types of costs for which the state is required to reimburse local agencies. The fundamental principle is that reimbursement is only required for "costs mandated by the state." Cal. Gov't Code §§ 17561. Such costs are specifically defined to exclude orders issued by regional boards pursuant to the Porter-Cologne Act. Id. at §§ 17514 and 16. Thus, the Legislature clarified that the "unfunded mandate" provision of the California Constitution does not apply to regional board WDRs.

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[23] As SUSMPs are exempt from CEQA, Petitioners' arguments about the Regional Board's failure to consider potentially significant adverse effects of the SUSMP are irrelevant, as are any references to the potential-impacts and categorical-exemption discussions in Azusa Land Reclamation Co., Inc. v. Main San Gabriel Basin Watermaster, cited in Ps & As at 11-12.

[24] Section 6 of Article XIII.B of the California Constitution provides in pertinent part:

> Whenever the Legislature or any State agency mandates a new program or higher level of service on any local government, the State shall provide a subvention of funds to reimburse such local government for the costs of such program or increased level of service. Cal. Const. Art. XIII.B, § 6.

[25] In the Matter of the Petition of the City of San Bernardino, State Board Order No. WQ 91-08 (July, 18, 1991) ("WQ 91-08") at *5.

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On this basis, the State Board has routinely found that regional board orders establishing WDRs are not reimbursable. See, e.g., WQ 91-08, supra note 25 at *8 (noting its recommendation to the Commission on State Mandates to deny a claim that WDRs constituted an unfunded mandate for five different reasons, including the facts that the orders were not executive orders and that they were designed to implement federal law). In fact, the State Board has been abundantly clear that the entire NPDES program is exempt from this constitutional requirement. In responding to a claim by the San Diego Unified Port District that including it as a responsible party on an existing NPDES permit violated the "unfunded mandates" provision, the State Board stated:

> We disagree with . . . the contention that this constitutional provision applies to NPDES permits. The requirement to reimburse local agencies for state-mandated costs does not apply to NPDES permits issued by the Regional Boards. The NPDES program is a federally-mandated program. . . . Further, claims for reimbursement of state mandates rest solely with the Commission on State Mandates and not with the agency issuing the underlying order."[26]

It is a therefore a well-established fact that *regional* board orders implementing the CWA are exempt from the requirements of reimbursements.

Petitioners nevertheless attempt to argue that the Regional Board's adoption of the SUSMP was a purely "discretionary" act, see, e.g., Bellflower Petition at 21; WSPA Petition at 6, and that it therefore does fall under the "unfunded mandates" provision. Not only is this irrelevant, based on the standard articulated above, but both the BMPs and the SUSMP clearly are mandated, by both the CWA and the Permit. The SUSMP does not become an unfunded mandate simply because the Regional Board appropriately exercised its discretion in defining the particulars. Moreover, under WSPA's logic (which is again premised on a misunderstanding of Defenders of Wildlife), virtually everything that any regional board did would require state subvention.

9. The SUSMP is Not an Underground Regulation Because it is an Element of a Permit

Petitioners claim that the SUSMP constitutes a "regulation" promulgated in violation of the California Administrative Procedures Act ("APA"). Ps & As at 10-11; Bellflower Petition at 22-

[26] In the Matter of the Petition of San Diego Unified Port District, Order No. WQ 90-3 (May 17, 1990) at *18 (emphasis added).

23; WSPA Petition at 5. Chapter 3.5 of the APA, Cal. Gov't Code §§ 11340-59, prohibits state administrative agencies from issuing any "regulation" without complying with APA procedures for the adoption of regulations. Id. at § 11340.5(a). Regulations that are adopted in violation of these procedures are often referred to as "underground regulations." Frankel v. Kizer, 21 Cal. App. 4th 743, 747 (1993).

However, as indicated above, the APA rules regarding underground regulations apply only to "regulations" as defined in the Government Code. Cal. Gov't Code § 11340.5(a). As Petitioners themselves admit in their brief, "California law does not require administrative agencies to comply with the APA when simply issuing or amending permits, including waste discharge requirements." Ps & As at 10. Petitioners are correct. The APA explicitly excludes the "issuance of [WDRs] and permits pursuant to section 13263" from its ambit. Cal. Gov't Code § 11352(b). Since the SUSMP is an element of the Permit, which is also a WDR, this concession is dispositive of the issue, and the SUSMP is "not subject to [the relevant] chapter" of the APA. Id. at § 11352.

Petitioners, citing Cal. Gov't Code § 11342(g), go on to argue that the APA provides an exception to the exemption for cases in which a permit constitutes a "standard of general application." However, the section cited by Petitioners merely defines "regulation" to include standards of general application; it does not contradict the overarching and admitted restriction on the entire chapter of the APA that is at issue – namely, that it does not apply to permits (even though permits, of course, by definition, do apply generally to all permittees).[27]

WSPA also argues that Government Code section 11352(b) is inapplicable because it exempts only "required" waste discharge requirements and permits. However, the exemption provided by this statutory section is not so limited. Moreover, WSPA provides no basis for its interpretation of the statute as being so limited. Instead, WSPA once again relies on its mistaken assumption that the SUSMP is both water quality-based and a numerical effluent limit for

[27] Nor does Petitioners citation to State Water Resources Control Bd. v. Office of Admin. Law aid them. See Ps & As at 10-11. As Petitioners admit, that case dealt with an amendment to a water quality control plan. Whether or not such plans constitute "regulations" for APA purposes is irrelevant, as the SUSMP is an element of a permit, not a water quality control plan. Furthermore, such plans do not enjoy the benefits of Government Code section 11352(b), which specifically exempts permits and WDRs.

municipal discharges (and therefore not "required") in order to make its interpretation useful to it. The SUSMP is neither. See above. Thus, even under WSPA's unsubstantiated interpretation of Government Code 11352(b) as applying only to "required" WDRs, this section still would apply to the SUSMP, thus exempting it from APA requirements.

E. Request for Stay

Petitioners requests for stays of the SUSMP and various other Regional Board actions are addressed in the accompanying Stay Opposition, which is incorporated by reference herein. In essence, these requests should be denied because Petitioners have completely failed to satisfy the well-established prerequisites for obtaining a stay.

F. Request for a Hearing

All of the Petitioners save WSPA requested a hearing before the State Board. Bellflower Petition at 24. However, State Board regulations establish clear conditions that must be satisfied in order for a hearing to be granted, and those conditions have not been satisfied here. The regulations state:

> If petitioner requests a hearing for the purpose of presenting additional evidence, the petition shall include a statement that additional evidence is available that was not presented to the regional board or that evidence was improperly excluded by the regional board. A detailed statement of the nature of the evidence and of the facts to be proved shall also be included. If evidence was not presented to the regional board the reason it was not presented shall be explained.

23 C.C.R. § 2050 (emphasis added).

Petitioners claim to have had "available evidence [that was] not presented to the Regional Board," Bellflower Petition at 24, yet they provide neither a sufficient explanation of the reason it was not presented, nor a "detailed statement of the nature of the evidence and the facts to be proved." Consequently, by the plain language of the applicable regulations, this request must be denied.

Their only explanation for why the information was not presented is their claim that the Regional Board provided late notice of certain changes and made substantive changes after the close of public testimony. Id. However, it is absolutely appropriate, and even routine, for the Regional Board to make changes to proposals at their hearings. Indeed, that is much of the purpose

of the hearing. Furthermore, as explained above, see § IV.A.2, because the changes were within the scope of the suggestions and challenges that had been circulated for over six months prior to the hearing, or at least were logical outgrowths thereof, the changes were perfectly legitimate. Petitioners had ample opportunity to present any information that they felt was relevant at any time between May of 1999 (see page 8) and January 26, 2000.

Furthermore, Petitioners provide no explanation of what information or evidence they wish to present, making it impossible to determine whether the information is substantively worthy of introduction. Moreover, this failure is in direct conflict with the requirements of the State Board regulations. Consequently, the State Board should deny Petitioners' request for a hearing and should rule directly on the merits of their petitions.

V. CONCLUSION

For all the foregoing reasons, the instant Petitions for Review should be DENIED.

Respectfully submitted,

DATED: May 2, 2000

NATURAL RESOURCES DEFENSE COUNCIL, INC.

By: _____
David S. Beckman
Alex N. Helperin
Attorneys for NATURAL RESOURCES DEFENSE COUNCIL, INC.

DATED: May 2, 2000

SANTA MONICA BAYKEEPER

By: _____
Steven Fleischli
Attorneys for SANTA MONICA BAYKEEPER

DATED: May 2, 2000

HEAL THE BAY

By: _____
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PROOF OF SERVICE

STATE OF CALIFORNIA)
) SS.
COUNTY OF LOS ANGELES)

I am employed in the County of Los Angeles, State of California. I am over the age of 18 and not a party to the within action. My business address is: 6310 San Vicente Boulevard, Suite 250, Los Angeles, California 90048.

On May 2, 2000, I served the within document described as **MEMORANDUM OF POINTS AND AUTHORITIES OF NRDC, SANTA MONICA BAYKEEPER, AND HEAL THE BAY IN RESPONSE TO PETITIONS FOR REVIEW** on the interested parties in said action by faxing a true copy thereof to the parties and fax numbers indicated below and/or by placing a true copy thereof in the United States mail enclosed in a sealed envelope with postage prepaid, addressed to the interested parties as follows:

SEE ATTACHED SERVICE LIST

I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. It is deposited with U.S. postal service and/or an overnight courier service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on May 2, 2000 at Los Angeles, California.

Virginia Calvano

R0072666

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FAX TRANSMISSION

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FROM: Alex N. Helperin

MESSAGE:

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R0072668

NATURAL RESOURCES DEFENSE COUNCIL

May 23, 2000

VIA FACSIMILE (916/653-0428) & U.S. MAIL

Elizabeth Jennings
Senior Staff Counsel
Office of Chief Counsel
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Re: Scheduling of Expert Testimony
Petitions of the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association, for Review of January 26, 2000 Action of the Los Angeles Regional Board, "and Actions and Failures to Act by Both the Regional Board and Its Executive Officer"

Dear Ms. Jennings:

The Natural Resources Defense Council ("NRDC"), Santa Monica BayKeeper, and Heal the Bay, having been designated as a "party" for purposes of the hearing on the above-referenced petitions (the "Hearing"), are currently arranging witnesses and testimony for presentation at the Hearing. We are writing to formally request that the agenda for the Hearing be structured so as to permit the attendance of Dr. Richard Horner – a national expert on stormwater management who is extremely familiar with the program at issue – as an expert witness. Dr. Horner's testimony is critical to the presentation of our case, for the reasons articulated below. Indeed, his absence due to a scheduling conflict would be prejudicial to our case, given the fact that we received less than thirty days' notice of the Hearing.

Dr. Horner is a professor in the Departments of Civil and Environmental Engineering and Landscape Architecture at the University of Washington, where he has been teaching and conducting research on issues of urban runoff for the past 18 years. He has published over 100 book chapters, articles, and technical reports on the subject of urban runoff.

Dr. Horner is extremely familiar with the standard urban stormwater mitigation plan ("SUSMP") that is being challenged. He has followed the development of the SUSMP, and he has submitted testimony to the Regional Board, in the form of signed declarations accompanying NRDC's comment letters. Indeed, he has served as NRDC's primary consultant in reviewing the SUSMP. Dr. Horner's insights into the SUSMP are therefore unique – if not indispensable.

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www.nrdc.org

Dr. Horner lives in Seattle and, due to personal obligations, must be back in Seattle by 5 p.m. on the evening of June 7, 2000. The available commercial flights require that, in order for him to meet this prior obligation, he must fly out of Los Angeles International Airport at 12:30 p.m. on June 7. Thus, the only time on June 7 when Dr. Horner is able to testify is between 10 and 11:30 a.m. (Dr. Horner is also available to testify on June 8, but scheduling his testimony then is precluded by the fact that the Hearing may conclude on June 7.)

Dr. Horner has offered to sign a written affidavit that could be introduced at the Hearing. However, State Board regulations require that "[a]ny witness providing written testimony shall appear at the hearing and affirm that the written testimony is true and correct." 23 C.C.R. § 648.4(d). Consequently, his presence will nevertheless be required.

Accordingly, we hereby request that provision be made in the scheduling of the Hearing agenda to assure that Dr. Horner can testify – and, to the extent necessary, be cross-examined – between 10 and 11:30 a.m. on June 7. Alternatively, we request that the State Board guarantee that the Hearing will continue to June 8, in order to permit Dr. Horner to attend.

Thank you very much for your assistance in this matter. Feel free to contact me, at (323) 934-6900, if you have any questions regarding this request.

Sincerely,

David S. Beckman
Alex N. Helperin

cc: Xavier Swamikannu
Richard Motevideo, Esq.
Lyman C. Welch, Esq.
Stephen P. Deitsch, Esq.
Steven Fleischli, Esq.
Mark Gold
Heather Hoecherl, Esq.

R0072670

NRDC Presentation
June 6/7 2000

Types of Filtration Mechanisms

- Sand Filters
- Vegetative Filters
- Catch Basin Inserts
- Other Media Filters (including Compost)

Types of Gravity Separation

- Detention Basins
- Wet Ponds
- Oil/ Water Separators

Development Process of SUSMP

August 10, 1999 - Workshop

September 16, 1999 - Informational Item for the Board

September 16, 1999 - Public Comment before the Board

August - December - Approximately 50 Informal Meetings

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January 26, 2000 - Second Formal Hearing

Los Angeles Regional Water Quality Control Board
Standard Urban Stormwater Mitigation Plan Hearing
SWRCB/OCC Files A-1280, (a) and (b)

California State Water Resources Control Board
June 7-8, 2000

Presented by:

Natural Resources Defense Council
Santa Monica BayKeeper
Heal the Bay

Mark Gold, D.Env.
Executive Director of Heal the Bay

- D.Env., Environmental Science & Engineering
- M.S., Biology
- Adjunct faculty member, UCLA
- Member of EPA's Federal Advisory Committee for Urban Wet Weather
- Conducted research on local water quality for over 15 years

The Economic Benefits of Clean Coastal Waters

- Ocean Dependent Activities generates approx. $9 billion annually for Southern California
- Coastal tourism generates approx. $2 billion annually to LA County
  (not including fishing, navigation, and other commercial purposes)
- 50-60 million visitors annually to Santa Monica Bay Beaches alone

Urban Runoff Problem in Los Angeles County

- Largest source of impairments to Santa Monica Bay
- Southern California has one of the worst runoff problems in the entire country

Urban Runoff Problem in Los Angeles County

- Beaches with poor water quality
- Aquatic toxicity
- Contaminated Sediments
- Trash and Debris
- Increased erosion and sedimentation and habitat degradation

The 1998 303(d) List of Impaired Waters

In Region 4:

- 156 impaired water bodies and water body segments
- 734 specific impairments
- 19 major pollutants of concern

The 1998 303(d) List of Impaired Waters

Common Contaminants of Concern:

- Heavy Metals - copper, lead, zinc
- Oil and Grease
- Polycyclic Aromatic Hydrocarbons
- Trash and Debris
- Total Suspended Solids (TSS)
- Pathogens
- Nutrients
- Pesticides

Contaminants of Concern in Urban Runoff in the Los Angeles Region

➢ Studies have found that concentrations of contaminants of concern in the region's storm drains exceed federal and state water quality criteria (e.g. 1993 AOC Report)

Beach Contamination due to Urban Runoff in the Los Angeles Region

- Studies have found high levels of indicator bacteria in both wet weather and dry weather in Santa Monica Bay (Gold, et al., 1990 and 1992; Stenstrom and Strecker, 1993)

- Studies have also found elevated indicator bacteria levels in storm drains which discharge to Santa Monica Bay (Gold, et al., 1990)

Adverse Health Impacts of Urban Runoff in the Los Angeles Region

1995 Epidemiological Study found a statistically significant increase in adverse health effects from swimming within 100 yards of a flowing storm drain, including:

- fever
- chills
- ear discharge
- vomiting
- coughing with phlegm
- gastrointestinal illness
- respiratory disease

Toxicity

- Studies have shown toxicity of stormwater flows in the region (e.g. Ballona and Malibu Creeks, Bay, S., et al. (1996))
- SCCWRP study on Ballona Creek:
  - Well developed toxic plume into Santa Monica Bay during rain events extended up to 2 miles offshore
  - Toxicity exhibited two days after rain
  - Zinc and copper accounted for 5-44% of toxicity

Trash and Debris

- 25% of bottom of SM Bay contains man-made materials
- Trash levels have remained consistently high since at least 1977
- Annual Costs to Clean-Up:
  - LA County - $4,000,000
  - City of Long Beach - $970,000
  - Port of Long Beach - $400,000

Contaminated Sediments

- Creates "Toxic Hot Spots" at the Mouths of Rivers
  - 14 Sites of Concern and 7 Hot Spots have been identified in the LA Region
- Marina del Rey/Ballona Creek
  - 725,000 cubic meters identified as contaminated with DDT, Dieldrin, Chlordane, and Metals
- Accumulation of Sediment
- Huge Costs Associated with Dredging

High Flow Rates Caused by Urban Runoff Can Cause Ecological Impairments

- Malibu Creek Watershed
- Natural Creeks
- Habitat Degradation
- Increased Erosion and Sedimentation

Water Quality Impacts of Increased Population Density and Imperviousness

- Increase in peak discharges
- Increase in volume of runoff from storms
- Increase in runoff velocity
- Increase in frequency and severity of floods
- Reduced stream flow during dry weather due to reduced infiltration
- Reduced infiltration and groundwater recharge

The Role of New and Redevelopment in Creating the Problem

- Storm water pollution = volume and velocity of surface runoff + concentration of pollutants in runoff
- By creating impervious surface, development has dramatic effects on increasing the quantity and quality of storm water runoff
- Adverse effects are encountered at 10% impervious surface in a watershed or subwatershed

The CWA Requires the Inclusion of BMPs in Municipal Stormwater Permits

- Municipal storm water permits must "require controls . . . including management practices [BMPs], control techniques and system, design and engineering methods . . . as appropriate for the control of such pollutants." 33 U.S.C. Sec. 1342 (p)(3)(B).

- BMPs are required in permits "where reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of [the] CWA." 40 C.F.R. Sec. 122.44(k)(3).

The CWA Requires the Inclusion of BMPs in Municipal Stormwater Permits

- The CWA also authorizes the EPA and authorized states to issue permits that include <u>any conditions deemed necessary</u> to carry out the provisions of the CWA. 33 U.S.C. Sec. 1342(a)(1); <u>NRDC v. Browner</u>, 568 F.2d 1369 (D.C. Cir. 1977).

The CWA Requires the Inclusion of BMPs in Municipal Stormwater Permits

- Federal regulations require BMPs in permits where reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and extent of the CWA. 40 C.F.R. Sec. 122.44(k).

The CWA Requires the Inclusion of BMPs in Municipal Stormwater Permits

- The Ninth Circuit upheld the inclusion of specific structural BMPs in a municipal stormwater permit. Defenders of Wildlife v. Browner, 191 F.3d 1159, 1161 (9th Cir. 1999).

Versions of the SUSMPs

- Early 1999 - Preliminary Drafts of Model SUSMPs for Cities within L.A. County
- May, 1999 - Los Angeles County's SUSMPs
- May 20, 1999 - "Final Draft" Model SUSMPs
- July 21, 1999 - Submittal of Proposed Model SUSMPs
- August 12, 1999 - Revised Proposed Model SUSMPs
- August 16, 1999 - Proposed Model SUSMPs with Changes by Board Staff
- December 7, 1999 - Final Tentative SUSMP
- March 8, 2000 - Final SUSMP

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Supporters of the Final SUSMP

EPA
California Coastal Commission
City of Los Angeles
City of Calabasas
City of Santa Monica
City of West Hollywood
Santa Monica Mountains Conservancy

The Foremost Stormwater Experts In The Country Support The Use of This Standard

Dr. Michael Stenstrom -- Los Angeles, California (UCLA)

Dr. Richard Horner -- Seattle, Washington (Univ. of Wash.)

Thomas Schueler -- Washington, D.C.
(Center for Watershed Protection)

Dr. Robert Pitt -- Birmingham, Alabama (Univ. of Ala.)

Studies in the Record Regarding BMP Effectiveness

Industry - "American Society of Civil Engineers"

Academia - "Horner, *et al.*"

Government - "EPA"

Other - "Center for Watershed Protection"

Two separate groups have developed databases on the issue of BMP effectiveness. "The Center for Watershed Protection... has prepared a database containing BMP performance data for 123 structural BMPs,"[1] and the American Society of Civil Engineers has developed what EPA refers to as "a comprehensive database on BMP performance."[2]

[1] U.S. EPA, *Results of the Nationwide Urban Runoff Program (Volume 1-Final Report)*, December 1983, at 5-47.

[2] www.epa.gov/OST/stormwater, December 10, 1999.

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- August 16, 1999 - Proposed Model SUSMPs with Changes by Board Staff
- December 7, 1999 - Final Tentative SUSMP
- March 8, 2000 - Final SUSMP

Water Code Section 13360 Does Not Prohibit the Adoption of Specific BMPs

- The SUSMP is a statutorily mandated compilation of required practices and structures, along with a minimum performance level.

- The SUSMP does not prescribe "the manner in which compliance may be achieved with a discharge standard." Tahoe-Sierra Preservation Council v. State Water Resources Control Bd., 210 Cal. App. 3d 1421, 1438 (1989).

- The SUSMP is similar to the runoff limits for new development upheld in Tahoe-Sierra.

Water Code Section 13360 Does Not Prohibit the Adoption of Specific BMPs

- The CWA requires the use of BMPs and pre-empts any conflicting state law.

- "Notwithstanding any other provision of [the Porter-Cologne Act], the state board or regional boards shall, as required or authorized by the [CWA] . . . issue waste discharge requirements . . . [to] ensure compliance with all applicable provisions of the [CWA] . . ." Cal. Water Code Sec. 13377.

The CWA Requires the Inclusion of Specific BMPs in Municipal Stormwater Permits

- BMPs are defined to include "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution.... BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff...." 40 C.F.R. Sec 122.2.

The Adoption of the SUSMP is Exempt from CEQA Requirements

- "Neither the State Board nor the Regional Boards shall be required to comply with the provisions of [CEQA] prior to the adoption of any waste discharge requirement." Water Code Sec. 13389.

- The SUSMP is a part of the Los Angeles County Permit, which is a WDR.

Contrary to WSPA's Contention, the Requirement for BMPs is Federally Mandated and Thus Exempt From CEQA

- The SUSMP is mandated by the CWA in that it is a minimum performance level established to satisfy the MEP requirement of CWA sec. 402(p).
- The SUSMP is not a numeric effluent limit.
- WSPA's reliance on Defenders of Wildlife v. Browner is completely misplaced.

The SUSMP is NOT an Unfunded Mandate

Regional Board orders implementing the CWA are exempt from the requirements of reimbursements.

- "The requirement to reimburse local agencies for state-mandated costs does not apply to NPDES permits issued by the Regional Boards."[1]
- Gov't Code Sec. 17514 and 17516 specifically exclude orders issued by Regional Boards pursuant to the Porter-Cologne Act from the requirements of reimbursement.

[1] In the Matter of the Petition of San Diego Unified Port District, Order No. WQ 90-3 (May 17, 1990) at *18.

The SUSMP is NOT an "Underground Regulation" Promulgated in Violation of the APA

- **The SUSMP is not a regulation as defined by the APA.**
- **The APA explicitly excludes the "issuance of [WDRs] and permits pursuant to section 13263." Cal. Gov't Code Sec. 11352(b)**
- **The SUSMP is part of a WDR.**

"Conventional structural BMPs can be a useful element in the management of storm water quality but they are not a panacea to achieve water quality standards."[1]

"Changes in urban planning and design will also be required to address peak flow and volume increases that occur with urbanization."[2]

[1] Scott Taylor, PE, Vice President RBF, "Overview of Conventional Stormwater Runoff Water Quality BMP Characteristics and Performance", *Stormwater Runoff Water Quality Science/Engineering Newsletter*, May 19, 2000, Vol. 3, No. 2, 1.

[2] *Id* at 2.

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STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In Re: the Consolidated Petitions of the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association, for Review of Actions and Inaction by the California Regional Water Quality Control Board, Los Angeles Region, and its Executive Officer, in Connection with Order No. 96-054 [NPDES No. CAS614001] and Resolution No. R-00-02 (Jan. 26, 2000).	SWRCB/OCC FILES A-1280, (a), and (b) POST-HEARING BRIEF ON BEHALF OF NRDC, THE SANTA MONICA BAYKEEPER, AND HEAL THE BAY Date: N/A Time: N/A Location: N/A

R0072690

I. INTRODUCTION

The Natural Resources Defense Council, Heal the Bay, and the Santa Monica BayKeeper (collectively, "NRDC") submit this post-hearing brief in response to the four questions raised by the State Water Resources Control Board ("Board") in its June 12, 2000 letter. The answers to the Board's four questions are found by considering the basic, underlying legal standard that governs the development of the program at issue and municipal stormwater programs in general.

The main purpose of the Standard Urban Stormwater Mitigation Plan ("SUSMP") adopted by the Los Angeles Regional Water Quality Control Board ("LA-RWQCB" or "Regional Board") is identical to the federal statutory requirement underlying any municipal stormwater program: to minimize the discharge of pollutants to the maximum extent practicable. SUSMP at 2 and 6; Permit, Part 2; 33 U.S.C. § 1342(p)(3)(B)(iii). While additional requirements also apply, the maximum extent practicable (or "MEP") standard is a fundamental one with which any modifications to the SUSMP must be consistent.

In order to effectively minimize the discharge of pollutants, as required by MEP, a stormwater pollution control program must satisfy a number of requirements, of which two are particularly relevant here: (1) it must be of sufficient scope to address all the major sources of pollution; and (2) it must include a performance standard to ensure that it effects clear requirements, effective controls, and a level playing field. In addition, the ultimate objective of this and other programs implemented under the Permit is "to protect the beneficial uses of receiving waters in Los Angeles County." Permit at 7, Finding 27.

Given these considerations, the .75-inch design standard is the absolute minimum sizing standard that will satisfy the applicable legal requirements. Further, the SUSMP must apply to "environmentally-sensitive areas" and to *both* "ministerial" and "discretionary projects." Finally, the definition of "redevelopment" must remain essentially the same as it is now. By retaining these essential aspects of the SUSMP, as approved by the Regional Board, the Board can assure that the SUSMP program is consistent with the MEP standard. Just as important, the Board can assure that it supports the efforts of a unanimous Regional Board in taking a critical step toward controlling one of the worst storm water pollution problems in the nation.

III. THE BOARD'S FOUR QUESTIONS

A. The 0.75-inch Design Standard

1. Is It the Appropriate Numerical Standard?

The 0.75-inch design standard[1] currently in the SUSMP is the minimum acceptable standard for development planning in the Los Angeles area. A more appropriate standard for development in the Los Angeles area would require projects to be designed to mitigate all the runoff generated from either the first 1.0 inches of rain, or from the a one-year, 24-hour storm, whichever is greater, as recommended by Dr. Richard Horner, a nationally renowned stormwater expert.[2] Nonetheless, as is explained below, the 0.75-inch standard is minimally acceptable for the region.

a) Application of the MEP Standard

The appropriate numerical sizing standard is one that satisfies the underlying requirement to control the discharge of pollutants to the maximum extent practicable. Uncontroverted evidence in the record – as well as common sense – indicates that the greater quantity of water that a structural best management practice ("BMP") is designed to handle, the more pollution it can remove. See also LA-RWQCB Resolution No. R-00-02, Finding 10 ("[t]he ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time.") Thus, if the standard were simply to control the discharge of pollutants to the "maximum extent," the answer to the question of the appropriate standard would be simply: "the bigger, the better."

The remainder of the "maximum extent practicable" standard introduces the notion of practicability. It essentially limits the "the bigger, the better" mandate at the point at which it becomes impracticable to design BMPs any larger. "Practicability" can be assessed in this context by the real-world experience of literally hundreds of other jurisdictions across the nation, which already institute programs similar to the SUSMP, with sizing standards far in excess of 0.75

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[1] In reality, the numerical design standard provided in the current SUSMP provides a more flexible list of four different equations, from which the regulated parties can select. We refer to that standard as "the 0.75-inch design standard" for simplicity.

[2] See NRDC Comment Letter (Sept. 9, 1999) at 1, n.2 (Admin. Record, Vol. VII, Item 30), for a more comprehensive discussion (hereinafter referred to as "September Comment Letter").

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inches.[3] Locally, the City of Santa Monica has had a similar program in place for several years, employing, for example, a 1.0 inch standard for new parking lots. The fact that so many municipalities have been able to implement programs with sizing standards of 1.0-1.3 inches, without any demonstrated negative social or economic consequences, conclusively demonstrates that it is not impracticable to implement a 0.75-inch standard in Los Angeles. Thus, in order to comply with the legally-mandated MEP standard, the SUSMP must include a sizing standard that is equal to or greater than 0.75 inches.

b) Using Diminishing Returns as a Standard

There are other means of determining the limits of practicability. Several experts around the country have endorsed a system that uses empirical data regarding the pollution removal efficiencies of BMPs as their size increases to find the "point of diminishing returns." This is not the applicable legal standard, but we address it here because of its apparently wide-spread use.

This method recognizes that, as the size of a BMP increases by a fixed amount, the amount of corresponding benefit obtained becomes progressively smaller; hence, "diminishing returns." The County of Los Angeles ("County") used this method to develop its numerical design standard, and the result was the adoption of the 0.75-inch standard. See discussion in September Comment Letter at 2-3 (Admin. Record, Vol. VII, Item 30). The County also incorporated the MEP standard in its analysis. See Id. at 1.

The LA-RWQCB used a version of this approach in developing its standard, as well. The 0.75-inch design standard appears in Section 9 (page 10) of the SUSMP.[4] When this model is used in Los Angeles, and local hydrologic conditions are inserted into the equation, the resulting number is approximately 0.75 inches. Never, in the more-than-a-year that this issue has been being discussed, has any of the Petitioners presented a single iota of actual data to counter this fact.

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[3] See, e.g., Exhibit L to the brief "Points and Authorities To Be Presented by NRDC, the Santa Monica BayKeeper, and Heal the Bay," submitted to the Board on May 31, 2000.

[4] The first option listed in Section 9 for calculating the minimum size for structural BMPs is to use the industry-standard WEF model and the "maximized capture storm water volume," which is based on this principle of diminishing returns.

c) Support for the 0.75 Inch Standard

Finally, we note that the 0.75-inch design standard is not only minimally acceptable under the MEP standard and repeatedly validated by analyses of diminishing returns, but it is also widely supported by experts and agencies all over the country. In fact, as the Record shows, this standard was supported by *the four leading stormwater experts in the United States*: Dr. Michael Stenstrom (UCLA), Dr. Robert Pitt (Univ. of Alabama), Thomas Schuler (Center for Watershed Protection), and Dr. Richard Horner (Univ. of Washington). It is also supported by the United States Environmental Protection Agency, the California Coastal Commission, and the Santa Monica Mountains Conservancy. The strong support of top-notch experts from every region of the United States serves to underscore that the opposition of some cities and a few industry groups is largely knee-jerk. Rarely, if ever, has *any* technical proposal by *any* Regional Board received such extraordinary national support.

d) Summary

In sum, whatever criterion one selects – the legal standard of MEP, the industry models of diminishing returns, or reliance on expert recommendations – the existing standard is the right one.

2. Should There Be Different Numerical Standards For Different Areas?

Answer: Not beyond what the SUSMP already provides. No change should be made.

As is explained above, see supra at 3 and footnote 1, the SUSMP actually provides four different options for calculating the numerical design standard for structural BMPs. These various formulas take into account both the degree of imperviousness and the local hydrologic conditions. Thus, the numerical design standard is already tailored to both site-specific and regional conditions.

Furthermore, to the extent that the standards are based on principles of diminishing returns, those principles apply equally regardless of the locale. The shape of the curve representing the percentage of pollutants removed relative to the size of the BMPs is essentially the same regardless of how much rainfall occurs or what the characteristics of the site are. Thus, in order to maximize the cost-effectiveness of this program, one can choose an optimal sizing standard (or formula) that works independent of the location within the basin. This is what the LA-RWQCB has done.

Finally, there are the related issues of level playing fields and simplicity. Were a variable standard implemented, some cities are sure to claim that they will be disadvantaged compared to other municipalities. More important perhaps, variable standards would be more difficult to implement and monitor, making the task of reducing runoff pollution more challenging to the RWQCB staff and also to those with the responsibility of complying with the SUSMP.

B. Redevelopment

The "redevelopment" issue became clouded at the Hearing, partly due to ambiguity within the SUSMP, and partly due to the extreme and misleading examples suggested by the Petitioners. NRDC supports the Board's efforts to clarify this issue, while leaving existing definitions largely intact. In addition to answering the Board's specific questions, we attempt to provide a more cogent structure below as well as set forth language that can be used in the SUSMP (see page 8).

As a preliminary matter, it is important to understand the general scope of application of the SUSMP program, and to draw two clarifying distinctions regarding SUSMP requirements.

1. The Scope of the SUSMP Program

There are two separate criteria that must be satisfied by any development project for the SUSMP requirements to apply to it: (1) it must be of a type that is among the nine enumerated categories in the SUSMP; and (2) it must qualify as "new development" or "redevelopment," as defined in the SUSMP. In order to clarify the SUSMP's application, the definition of "redevelopment" should be clarified and there should be a distinction drawn to clarify the application of two different types of SUSMP requirements.

2. Distinction: Baseline BMP Requirements v. Sizing Requirements

The first distinction is between the two types of requirements imposed by the SUSMP, which we refer to as (1) the "baseline BMP requirements" and (2) the "sizing requirement." The baseline BMP requirements appear in Sections 6, 7, and 10 of the SUSMP, and require specific, individual, common-sense BMPs, tailored to the specific type of development at issue. (For example, loading dock areas and fueling stations must be covered, SUSMP at 11 and 12.)

The intent of the SUSMP is that common-sense, "baseline BMP requirements" apply to any development to which they are relevant, regardless of whether it otherwise qualifies as "redevelopment," provided the development meets the first criterion above – i.e., it is among the nine enumerated categories. (In other words, any time a fueling station is built at a gas station, it should be covered; any time a trash containment area is built at one of the nine types of facilities, it should be screened.) Developers should not be able to avoid these basic, common-sense requirements by "piecemealing" their development to keep it under a "redevelopment" threshold.

The "sizing requirement," on the other hand, which appears in Section 9 of the SUSMP, requires the mitigation of a minimum volume of runoff, by designing additional structural BMPs to be at least a minimum size. Here, a threshold is necessary, as the Board recognized in asking what types of projects should be included "within the mitigation requirements?" Thus, the following discussion is limited to the application of the sizing requirement.

3. The Second Distinction – Entire Facility v. Newly Developed Area

The second distinction to bear in mind is a distinction between two different thresholds that trigger compliance with the sizing requirement: first, the type and amount of development that should trigger compliance with the sizing requirement *just with respect to the area developed*; and second, the type and amount of development that should trigger a requirement to bring an *entire facility* into compliance with the sizing requirement, as if the whole facility were being built at that time. The answer to the Board's question (what types of redevelopment should trigger a sizing requirement?) differs depending on how much of a facility the sizing requirement is to apply.

a) Mitigation of the Runoff From the Entire Facility

The intent of the redevelopment provisions was to ensure that, if there is a major change to a facility, the entire facility must come into compliance with the numeric sizing requirement, the 0.75 standard. See, e.g., Hearing Tr. at 304. No one ever intended it to apply to the resurfacing of a roof, as the Petitioners suggested at the Hearing. The first sentence in the current definition of

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"redevelopment" lists three (3) types of changes that constitute redevelopment:[5] (1) additions of at least 5,000 square feet, (2) additions of at least 50% of impervious surface, or (3) *improvements to fifty percent or more of the existing structure*. It is the third part of this definition that is confusing and should be modified.

In order to accomplish the intended purpose – to apply the numeric sizing requirement to an entire facility only when that facility undergoes a major change – the definition of "redevelopment" should include the second factor from the current definition and an analogous cost threshold (as in the County program). Thus, an entire facility (which falls within one of the nine categories covered by the SUSMP) should have to comply with the sizing requirement whenever any of the following changes are made (whether it be in the context of redevelopment or remodeling – the terminology does not matter, if one of these criteria is met): (1) there is a 50% increase in impervious area, (2) the cost of new improvements exceeds 50% of the market value of the existing improvements (this is consistent with the County's program).

b) Mitigation of Runoff From the Modified/Newly Developed Area

The first factor in the current definition – the addition of 5,000 square feet – was intended to serve as a floor, to ensure that large facilities could not add 49% to their areas without having to comply with the numeric sizing requirement. However, there is some indication that the intent was for very large facilities (e.g., 100,000 ft.^{2}) that add more than 5,000 ft.^{2} of impervious surface <u>but less than 50 percent</u> of their total area to have to comply with the numeric sizing requirement *only on the new area*, rather than having to bring the entire facility into compliance.

NRDC can accept this limitation with one caveat: given that such redevelopment need only mitigate the runoff <u>from the new area</u>, this requirement is actually quite modest. Accordingly, NRDC believes that the threshold should be 1,000 ft.^{2}. The requirement would still exclude minor redevelopment, but there is no reason why redevelopment of more than 1,000 ft.^{2} should be exempt from the mitigation requirement <u>on that redeveloped area</u>. Moreover, since this only applies to the

[5] The second sentence in the definition is meant to be illustrative only, and its specifics of that language is not important, provided the first sentence is clarified, as nothing that does not satisfy the criteria in the first sentence would be regulated based on the second sentence.

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second of the two SUSMP application criteria, the additional 1,000 ft.^{2} would still have to occur at one of the nine types of enumerated facilities for the requirement to apply.

4. Suggested Language

In order to effectuate the system described above, changes are necessary to the definition of redevelopment, as well as to the scoping language that explains which of the requirements in the SUSMP apply to redevelopment projects. We suggest the following change to the definition of redevelopment and the addition of a section on scope of application, as follows:

a) Redevelopment

" 'Redevelopment' means, on an already developed site, the creation or addition of at fifty percent or more of impervious surfaces or the making of improvements valued at at least 50 percent of the value of the existing improvements. Redevelopment may include, but is not limited to . . ."

b) Scope of Application to Development and Redevelopment

"All of the requirements of this SUSMP apply to any new development that fits within one of the nine enumerated categories.

"All of the requirements of this SUSMP apply to the whole of any facility that fits within one of the nine enumerated categories and that undergoes any 'redevelopment,' as defined herein.

"Notwithstanding a failure to qualify as 'redevelopment,' as defined herein, any addition of 1,000 ft.^{2} of impervious surface to a facility that is among the nine enumerated categories must comply with the mitigation requirement in section 9 of the SUSMP in the newly developed area.

"All of the requirements of this SUSMP other than those in section 9 apply to any changes at existing facilities and any new development that is among the nine enumerated categories."

C. Environmentally-Sensitive Areas

There is no question that location should be a factor in determining the application of the SUSMP. The Permit itself is explicit about that. See Permit, Part 2.III.A.1.a. It is also consistent with the underlying objective of the permit, discussed in the Introduction, of "protect[ing] the beneficial uses of receiving waters." Permit at 7, Finding 27. Creating an additional category for environmentally-sensitive areas is a reasonable way to achieve this goal. Finally, the contention that the Permit only allows for new "development categories" to be added is completely unsupported and nonsensical. There is nothing in the Permit that limits the additional types of categories that the LA-RWQCB may add beyond the seven categories enumerated in the Permit.

R0072698

In addition, because projects within (or discharging to) an environmentally-sensitive area are a category unto themselves, based on the legitimate concern over the beneficial uses of those areas, there is no reason to further restrict the application of the SUSMP based on one or more of the other project types. Any new development or qualifying redevelopment within such an area should be covered. Of course, this would still exclude minor additions (under 1,000 ft^2) to existing developments. No change is necessary in the SUSMP to achieve this.

D. Discretionary Projects

The Board asked two questions: (1) whether the SUSMP should apply to discretionary, as well as ministerial, projects; and (2) how "discretionary" should be defined. The answer to the first question eliminates the need for an answer to the second, as the term "discretionary" is irrelevant. The SUSMP should apply to all project types that meet the two criteria defining the scope of the program (see supra at 5), regardless of whether such projects are deemed "discretionary" or not. Indeed, if the Board were to limit the SUSMP only to the relatively small number of projects which must receive discretionary approvals, the Board would effectively eviscerate the SUSMP.

Indeed, it would be arbitrary and capricious to limit the requirements of the SUSMP only to projects where permits are not "automatically" granted (i.e., discretionary projects). There is no meaningful distinction between discretionary and non-discretionary projects with respect to their potential impact on water quality, their ability to control runoff, or the reviewing agency's ability to ensure that these requirements are satisfied. Indeed, serious runoff pollution problems are defined by the fact that they are created by numerous incremental discharges of pollution, not only or primarily by a relatively few large, "discretionary" projects.

It is, therefore, not surprising that the Clean Water Act makes no distinction between "discretionary" and "non-discretionary" projects; the Act applies equally and generally without consideration of this distinction. In fact, the "discretionary/non-discretionary" dichotomy is an artifact of the California Environmental Quality Act ("CEQA") with no logical or legal applicability here. It would be a logical mistake, and a legal error, to so condition the SUSMP.

With respect to the Permit, although it does highlight discretionary projects, nothing in the Permit limits the LA-RWQCB's authority to apply the SUSMP more broadly. In fact, the Permit explicitly permits the SUSMP to apply to more categories of projects than are enumerated therein. Finally, if the Permit did profess to limit the LA-RWQCB's authority in a manner than prevented it from controlling the discharge of pollutants to the MEP, such a limitation would be invalid. See NRDC Opp. Brief at 9-10. Indeed, the Clean Water Act does not limit the application of the MEP standard to purely discretionary projects.

In sum, the requirements in the SUSMP are just like other commonplace codes (such as the electrical code or the building code) that apply generally. Building inspectors would have to ensure compliance with the SUSMP, just as they routinely do with respect to a myriad of other requirements, prior to issuing an approval. It is critically important that the Board allow the SUSMP provisions to work in the only way in which they will meaningfully reduce polluted runoff: by applying to all projects that fall within the SUSMP's substantive provisions, whether or not deemed "ministerial" or "discretionary" in the CEQA lexicon.

IV. Conclusion

For all the foregoing reasons, the demands within the Petitions for Review should be DENIED and the SUSMP should be upheld and modified as specified above.

Respectfully submitted,

DATED: July 6, 2000

NATURAL RESOURCES DEFENSE COUNCIL, INC.

By: _____

David S. Beckman
Alex N. Helperin
Attorneys for NATURAL RESOURCES DEFENSE COUNCIL, INC.

PROOF OF SERVICE

STATE OF CALIFORNIA)
) SS.
COUNTY OF LOS ANGELES)

I am employed in the County of Los Angeles, State of California. I am over the age of 18 and not a party to the within action. My business address is: 6310 San Vicente Boulevard, Suite 250, Los Angeles, California 90048.

On July 6, 2000, I served the within document described as **POST-HEARING ON BRIEF ON BEHALF OF NRDC, THE SANTA MONICA BAYKEEPER, AND HEAL THE BAY** on the interested parties in said action by placing a true copy thereof in the United States mail enclosed in a sealed envelope with postage prepaid, addressed to the interested parties as follows:

SEE ATTACHED SERVICE LIST

I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. It is deposited with U.S. postal service and/or an overnight courier service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on July 6, 2000 at Los Angeles, California.

Virginia Calvano

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SUSMP
env'tal group

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STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In Re: the Consolidated Petitions of the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association, for Review of Actions and Inaction by the California Regional Water Quality Control Board, Los Angeles Region, and its Executive Officer, in Connection with Order No. 96-054 [NPDES No. CAS614001] and Resolution No. R-00-02 (Jan. 26, 2000).	SWRCB/OCC FILES A-1280, (a), and (b) OBJECTIONS TO PETITIONERS' POST-HEARING BRIEF Date: June 7-8, 2000 Time: 10:00 a.m. Location: Torrance Cultural Arts Center

The Natural Resources Defense Council, Heal the Bay, and the Santa Monica BayKeeper (collectively, "NRDC") hereby object to the City of Bellflower, et al.'s post-hearing brief ("brief") on the ground that the brief exceeds the page length requirements imposed by the State Water Resources Control Board ("Board"). The brief also improperly cites documents which are protected by the attorney-client privilege. Each issue is briefly discussed below.

R0072703

First, the Board's June 12, 2000 Order regarding post-hearing briefs ("Order") stated, in pertinent part, that briefs were "subject to a 10-page, double-spaced limit" and that "[n]o new evidence, exhibits, or testimony may be attached." Board's Order at 1. Nevertheless, Petitioners attached a lengthy exhibit to their brief, in violation of the Order. The exhibit is directly responsive to the questions raised in the Board's Order, containing suggested SUSMP revisions. It contains information of exactly the type which was included by other parties in the text of their briefs proper. Petitioners should not be allowed to vastly expand their brief by breaking the rules.

Second, Petitioners purport to cite a communication between a Board attorney and a Regional Water Quality Control Board staff-member. This communication is subject to the attorney-client privilege and, therefore, should not have been used in this quasi-adjudicative administrative proceeding. (In this connection, it is worth noting that the communication does not stand for the premise for which it is cited. Rather, the attorney-client communication reflects a view on what Regional Board *staff* could do, on the one hand, and what the *Regional Board* could do, on the other.)

Therefore, NRDC respectfully requests that the Board strike Petitioners' post-hearing brief because it is significantly violates the Board's Order—as it was clearly calculated to do. The Board also should purge the administrative record of communications which are subject to the attorney-client privilege (or related doctrines protecting attorney work product).

Respectfully submitted,

DATED: July 24, 2000

NATURAL RESOURCES DEFENSE COUNCIL, INC.

By: _____

David S. Beckman
Alex N. Helperin
Attorneys for NATURAL RESOURCES DEFENSE COUNCIL, INC.

R0072704

PROOF OF SERVICE

STATE OF CALIFORNIA)
) SS.
COUNTY OF LOS ANGELES)

I am employed in the County of Los Angeles, State of California. I am over the age of 18 and not a party to the within action. My business address is: 6310 San Vicente Boulevard, Suite 250, Los Angeles, California 90048.

On July 24, 2000, I served the within document described as **OBJECTIONS TO PETITIONERS' POST-HEARING BRIEF** on the interested parties in said action by placing a true copy thereof in the United States mail enclosed in a sealed envelope with postage prepaid, addressed to the interested parties as follows:

SEE ATTACHED SERVICE LIST

I am "readily familiar" with the firm's practice of collection and processing correspondence for mailing. It is deposited with U.S. postal service and/or an overnight courier service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on July 24, 2000 at Los Angeles, California.

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SUSMP
NRDC
draft order
response

October 3, 2000

VIA FACSIMILE (916/653-0428) & OVERNIGHT DELIVERY

Chairman Arthur G. Baggett Jr. and Members of the Board
State Water Resources Control Board
901 P Street
Sacramento, CA 95814

Re: Draft Order: Petitions of the Cities of Bellflower, *et al.*, the City of Arcadia, and Western States Petroleum Association, for Review of January 26, 2000 Action of the Los Angeles Regional Board

Dear Chairman Baggett and Members of the Board:

I. Introduction

The Natural Resources Defense Council ("NRDC"), Santa Monica BayKeeper, and Heal the Bay hereby submit the following written comments on the August 24, 2000 draft order ("Draft Order") issued in the above-entitled matter by the State Water Resources Control Board (the "Board").

Generally, we support the Board's Draft Order and, in particular, those aspects which uphold the general thrust of the SUSMP program and its numeric sizing criteria. In general, we believe that the Draft Order, if finalized, constitutes a critical step forward in the battle to control this State's leading source of water quality impairment—polluted runoff.

Nevertheless, we are very troubled by three aspects of the Draft Order, each of which constitutes a substantial weakening of the SUSMP program approved by the Los Angeles Regional Water Quality Control Board ("Regional Board"). By overturning the Regional Board's inclusion in the SUSMP of retail gasoline outlets ("RGOs"), Environmentally Sensitive Areas ("ESAs"), and ministerial projects, the Board proposes to open serious loopholes in the plan. Not only is each of these three exclusions in the Draft Order legally unsupported, but each also constitutes extremely poor public policy. The role of this Board should be to support efforts by Regional Water Boards to tailor pollution reduction programs to the needs of the watershed. These three elements of the Draft Order constitute a profound deviation from this role.

II. Standard that Governs this Board's Review of the SUSMP.

As we described in our briefs, and at the hearing in this matter last June, the Board's role here is circumscribed by well-settled law. In short, the Board's actions must be based on substantial evidence in the record; furthermore, the basis and reasons provided by the Regional Board in support of the challenged action may not be disturbed where they are sound and well-justified in the record. *See In the Matter of the Petition of Stinnes-Western Chem. Corp.*, WQ 86-16 (Sept. 18, 1986) at 16-18.

III. The Board Must Revise the Draft Order and Uphold the Regional Board's Inclusion of Gas Stations, Environmentally-Sensitive Areas, and Ministerial Actions in the SUSMP.

The vast majority of the Draft Order clearly complies with the applicable legal requirements, but three elements just as patently do not: the RGO, ESA, and ministerial actions issues. With respect to each area, the Board appears to have ignored copious evidence in the administrative record that supports the Regional Board's actions while failing to articulate a reasonable basis, and substantial evidence, in support of its own proposed course.

A. The Board's Draft Order Fails to Identify A Single Valid Basis for Excluding Retail Gasoline Outlets from the Provisions of the SUSMP.

The Draft Order concludes that RGOs should not be subject to the SUSMP's numeric design criteria for three reasons: RGOs are "heavily regulated," relatively small (and therefore allegedly unable to treat storm water), and existing BMP approaches "should be adequate to achieve MEP." Draft Order at 22. None of these conclusions is supported by evidence in the record. Indeed, the Board's approach here is directly contrary to evidence submitted and testimony adduced at the June hearing in this matter.

First, there is not a scintilla of evidence in the record to support the notion that RGOs need not be subject to the SUSMP's design requirements because they are already "heavily regulated," the first premise advanced in the Draft Order. In fact, both the Geomatrix report prepared for WSPA, "Storm Water Best Management Practices for Retail Gasoline Outlets," and the California Storm Water Quality Task Force's "Best Management Practice Guide for Retail Gasoline Outlets" discuss the applicable regulatory context. Neither document identifies any regulatory program that even approximates the SUSMP's design requirements, nor any existing requirement that interposes any impediment to structural treatment approaches. *See* "Storm Water Best Management Practices for Retail Gasoline Outlets" ("Geomatrix") at 1-2; "Best Management Practice Guide for Retail Gasoline Outlets" ("SWQTF") at 2-3.

Second, there is not a scintilla of evidence in the record to support the concept that the "relatively small size" of RGOs precludes structural treatment approaches in general or those designed in compliance with the SUSMP numeric design approach specifically. In fact, the Geomatrix study discusses a wide variety of structural treatment approaches.

Far from stating or implying that these are impractical due to RGO size, WSPA's own consultants recognized that these approaches can, and would, be installed at RGOs:

> In the event that the practical pollution prevention measures described above [sweeping, canopies, etc.] are determined to be insufficient, *or in areas where additional controls are mandated*, it may be necessary to install storm water treatment devices.

Geomatrix at 15 (emphasis added). The Geomatrix report goes on to discuss appropriate structural BMPs and their relative effectiveness at controlling various pollutants, and WSPA's consultants even include references "that provide sufficient design level information . . . ." *Id.* Nowhere is any analysis provided that suggests that RGOs could not meet the SUSMP design standard. It is, therefore, nonsensical for the Board to rely on the "relatively small size" of RGOs as a basis for excluding them from a treatment requirement. The fact that installation of these devices is not desirable from WSPA's perspective is beside the point. *See Geomatrix* at 15-31.

Third, the record also does not provide even remote support for the Draft Order's vague suggestion that existing approaches "should be adequate" to meet MEP. Draft Order at 22. In fact, no state or federal agency has ever stated or implied that "existing approaches" are adequate to meet MEP. Just the opposite is true. The SWQTF document, for example, is prefaced by a half-page disclaimer which states, among other things, that no water board in California has "endorsed the contents" therein. SWQTF at 1. Indeed, the authors of the SWQTF report (who notably include representatives of ARCO, Unocal, Chevron, WSPA, and Geomatrix) do *not* state that the guide is intended to represent MEP.[1]

Critically in this connection, WSPA and its own experts have admitted that runoff from even "*properly operated and maintained RGOs*" is "not appreciably different" from sources which this Board and the Regional Board have determined, consistent with the MEP standard, must be subject to the SUSMP. *Geomatrix* at 32 (emphasis added). The Draft Order's exclusion of RGOs is, therefore, entirely arbitrary. By treating equally polluted sources, such as RGOs and parking lots, in a fundamentally different manner, the Draft Order fails to apply the MEP standard in an even-handed way. The Draft Order must be revised so that RGOs must meet all SUSMP requirements.

[1] To the contrary, they suggest that the collected BMPs discussed in the SWQTF report are intended to serve as a "default" approaches for the State, a purpose which logically presumes the necessity to go beyond "default" where circumstances require it.

B. **The Board's Draft Order Errs by Not Upholding the Applicability of the SUSMP to ESAs and Then Directing the Regional Board To Supply an ESA Threshold.**

Environmentally Sensitive Areas, known as ESAs, require the highest degree of protection from polluted urban runoff, and yet this Board proposes to offer these areas no protection at all. Because of apparent confusion over the manner in which the SUSMP is intended to work, an unsupported impression of the efficacy of current law in protecting ESAs, and an unwillingness to remand this issue back to the Regional Board for additional clarification, the Board suggests that it is indifferent to protecting California's most vulnerable ecosystems. We doubt that these are the Board's intentions and suggest a better course, one which is consistent with law: uphold the Regional Board's inclusion of ESAs in the SUSMP and direct the Regional Board to supply a new development project threshold after appropriate public notice.

First, the Draft Order betrays a misunderstanding of how the SUSMP applies to ESAs. The Draft Order suggests critically that the SUSMP, in this instance, is not "relatively simple to apply." Draft Order at 24. In point of fact, it is simple to apply when it comes to redevelopment projects. As to redevelopment, the generally applicable 5000 square foot SUSMP threshold applies to ESAs just as it does to any other development category. Hence the notion that the SUSMP might be triggered by something as small as a patio addition in an ESA is as absurd as it is calculated to frighten the Board. As for new development, the Regional Board appeared to concede that a minimum sizing threshold should be used—a revision which the Board acknowledges would clarify the SUSMP in regard to new development in or near ESAs.

Second, as with the RGO issue, here again the Board asserts, without foundation, that development in ESAs is already subject to "extensive regulation under other regulatory programs." Draft Order at 24. While it may be true that other programs, such as this Board's own Areas of Special Biological Significance ("ASBS") rules, can condition new development's impacts on water quality, there is no evidence in the record that demonstrates that these unnamed programs offer equivalent protection. For example, many ESAs would not come under this Board's ASBS program. Moreover, just this month, some dischargers have challenged the applicability of the ASBS protections to inland discharges and to storm water discharges, whether direct or indirect. Finally, even where ecologically sensitive areas have been designated with some sort of special status (such as Malibu Creek and Lagoon in Southern California), this has not prevented them from becoming polluted.

In short, the Board's premise does not withstand analysis and is faulty. Furthermore, it is entirely unsupported in the record as a basis to exclude ESAs from the SUSMP. Orders of the Board, like those of any administrative agency, cannot rest on cursory conclusions without support in the record. *See, e.g.*, 23 C.C.R. Section 648.7 ("[a]ny final decision of the Board . . . shall be based on the record and shall include a statement of reasons for the decision . . . .").

Third and finally, while the Draft Order's conclusion regarding ESAs is not explicitly predicated on the issue of whether ESAs are appropriately considered "development categories," there can be no question that the Regional Board's use of that term encompasses ESAs. Draft Order at 24. In arguing the contrary position, Petitioners attempt to make a linguistic mountain out of a molehill. The best evidence of whether the Regional Board considered ESAs to be a "development category" is to consider those permits issued by the Regional Board contemporaneously with the SUSMP. Those permits, Order No. 99-060 (City of Long Beach) and Order No. 00-108 (Ventura County), *make clear that SUSMP provisions apply to "development categories" and explicitly include ESAs as one such category. See* City of Long Beach Municipal Storm Water Permit, Order No. 99-060, at 16-17 and Ventura County Storm Water Permit, Order No. 00-108, at 16-17. This is direct and cogent evidence that the Regional Board considers "development categories" to include ESAs. Whether or not the Regional Board's phraseology here is artful is immaterial.

For these reasons, the Regional Board did not err by including ESAs in the Los Angeles County SUSMP, and this Board should not overturn this essential aspect of the SUSMP. The Board, instead, should remand the narrow new development "threshold" issue to the Regional Board. Remanding issues to a Regional Board is consistent with the Board's typical practice and, in this instance, is particularly appropriate given the Los Angeles RWQCB's great familiarity with the underlying issues.

IV. While the Permit Does Refer to Discretionary Projects, These References Do Not Amount to a Limitation on Applying the SUSMP to Non-Discretionary, or Ministerial, Projects.

The Draft Order identifies a number of references in the Permit to "discretionary" projects. Draft Order at 25. Petitioners claim that these references constitute a prohibition on the application of the SUSMP to non-discretionary projects. The Draft Order sustains Petitioners argument, although the Draft Order properly notes that "the limitation of the SUSMP to discretionary projects may not be sufficiently broad for an effective storm water control program." Draft Order at 25.

Nevertheless, neither the Petitioners nor the Board in the Draft Order have identified a single place in the Permit which "prohibits" or "limits" the SUSMP provisions to discretionary projects. Under the circumstances, the Board errs in transmuting the Permit's implied focus on discretionary projects into something it is not: a limitation on application to non-discretionary, or ministerial, projects.[2]

Rules of statutory construction, while not directly applicable to the interpretation of a permit, set forth approaches which are relevant nonetheless. It is a "cardinal rule of

[2] In this connection, it is logical that the Permit would focus on the largest projects, those that are typically "discretionary." These projects may, on their own, pose significant water quality threats and be subject to extensive public debate. The Permit's focus does not necessarily exclude application of the SUSMPs to run-of-the-mill ministerial projects, which naturally would not necessarily be the focus of extensive discussion.

statutory construction that courts must not add provisions to statutes." Security Pac. Nat'l Bank v. Wozab, 51 Cal. 3d 991, 998 (1990). Literal interpretations should be made unless repugnant to the obvious purpose of a statute. Duty v. Abex Corp., 214 Cal. App. 3d 742, 749 (1989).

Applying these rules to the Permit, it is clear that the Board is adding a prohibition to the Permit where the plain words of its text provides none. Likewise, the Board is failing to literally interpret the Permit. The Board is, instead, surmising the meaning of the Permit based on the interrelationship between a number of permit provisions, none of which states or approximates the extreme conclusion the Board is, *itself*, supplying (an absolute prohibition on application of the SUSMP to ministerial projects).

Even if the Board's interpretation of the Permit were correct, the fact that the Board itself recognizes that its interpretation is at odds with the probable needs of an adequate storm water control program (Draft Order at 25) has consequences which the Board may not avoid. The Board, essentially, is saying that the underlying Permit is (most probably) flawed in that, by not extending the SUSMP to ministerial projects, it does not control storm water pollution to the maximum extent practicable, as the Clean Water Act requires. At minimum, therefore, the Board must, consistent with the logic of its Draft Order, order the Regional Board to reopen and address this impermissible limitation in its current Los Angeles County storm water permit. It is inconsistent with the Board's duties here to recognize such an important shortcoming, in such an important element of the State's water quality control program, without assuring that the issue is remedied promptly.

V. Conclusion

For all of these reasons, we respectfully request that the Board finalize the Draft Order as proposed, but with the following important changes:

1. Affirm the applicability of the SUSMP's numerical sizing criteria to Retail Gasoline Outlets;

2. Affirm the applicability of the SUSMP, and its numeric sizing criteria, to Environmentally Sensitive Areas and remand the narrow issue of what new development threshold should apply to the Regional Board; and

(continued . . .)

3. Affirm the applicability of the SUSMP, and its numeric sizing criteria, to non-discretionary, or ministerial, projects and approvals.

Sincerely,

David S. Beckman
Alex N. Helperin
NRDC

Mark Gold
Heather Hoecherl
Heal the Bay

Steve Fleischli
Santa Monica BayKeeper

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February 25, 2000

[illegible] BOARD
QUALITY CONTROL BOARD
LOS ANGELES REGION

VIA FACSIMILE AND U.S. MAIL

State Water Resources Control Board
Office of Chief Counsel
901 "P" Street
Sacramento, CA 95814
Attn: Craig Wilson, Esq.
Assistant Chief Counsel

Re: Petition for Review of January 26, 2000 Action of the California Regional Water Quality Control Board, Los Angeles Region, and Actions and Failures to Act By It and Its Executive Officer, Dennis Dickerson, Pursuant to Order No. 96-054 (NPDES No. CAS 61400)

Dear Ladies and Gentlemen:

The undersigned serves as City Attorney for the City of Arcadia, California ("Arcadia"). Pursuant to Title 23 California Code of Regulations ("CCR") Section 2050, et seq., Arcadia hereby petitions the State Water Resources Control Board (the "Board"), pursuant to California Water Code Section 13320 and applicable California law, for review of the above actions and failures to act. Arcadia further requests an Immediate Stay pursuant to California Water Code Section 13321 and Title 23 CCR Section 2053, and further requests a Hearing pursuant to Title 23 CCR Section 2050(b).

Arcadia makes reference to the filing with the Board of a certain "PETITION FOR REVIEW OF JANUARY 26, 2000 ACTION OF THE CALIFORNIA REGIONAL WATER QUALITY CONTROL, LOS ANGELES REGION, AND ACTIONS AND FAILURES TO ACT BY IT AND ITS EXECUTIVE OFFICER, DENNIS DICKERSON, PURSUANT TO NO. 96-054 (NPDES NO. CAS 614001), filed with the Board together with supporting and related documents

on or about February 25, 2000 in the matter captioned, "The Cities of Artesia, et seq., et al. v. the California Regional Water Quality Control Board, Los Angeles Region, et al." (the "Related Petition"). Arcadia deems the facts, allegations and matters set forth in the Related Petition to be applicable to Arcadia and hereby joins in and intends to rely upon the Related Petition for purposes of Arcadia's Petition. Pursuant to Title 23 CCR Section 2050, Arcadia further sets forth the following:

(1) The City of Arcadia is a municipal corporation organized and existing under the laws of the State of California and located in the County of Los Angeles, California, and is governed by its Charter. Arcadia's address is City of Arcadia, 240 West Huntington Drive, P.O. Box 60021, Arcadia, California 92066-6021.

(2) Arcadia is a permitee under that certain Permit issued by the California Regional Water Quality Control Board, Los Angeles Region, on July 15, 1996, Waste Discharge Requirement for Municipal Storm Water and Urban Run-Off Discharges within the County of Los Angeles, Order No. 96-054 (NPDES No. CAS 614001). Arcadia is an interested aggrieved party as Arcadia is adversely impacted by actions taken by the California Regional Water Quality Control Board, Los Angeles Region and Dennis Dickerson ("Respondents") in connection with a Regional Board mandated Standard Urban Storm Water Mitigation Plan imposed on Arcadia and other interested parties on January 26, 2000, and as Arcadia is adversely impacted by failures to act on the part of the Respondents in connection with a Standard Urban Strom Water Mitigation Plan submitted by Arcadia and other parties in July of 1999. Arcadia is challenging the actions taken by the Respondents on January 26, 2000 and the failures of the Respondents to act lawfully in reviewing and approving the Standard Urban Storm Water Mitigation Plan submitted by Arcadia and other parties, in accordance with state and federal law, as described in the Related Petition.

(3) The date on which Respondents acted or failed to take appropriate action was January 26, 2000. On and after that date, the Respondents have continued to fail to take appropriate action as set forth in the Related Petition.

(4) Arcadia alleges that the actions and failures to act by the Respondents are inappropriate and improper, and in support of this allegation incorporates by reference herein the Related Petition and, without limitation, Paragraphs 11 through and including 75 thereof.

(5) Arcadia is aggrieved as result of the actions and failure to act by the Respondents and, in support in of this allegation, incorporates by reference herein the Related Petition and, without limitation, Paragraphs 11 through 86 thereof.

(6) Arcadia requests that the Board grant to Arcadia the relief set forth in Paragraphs (1) through and including (6) on pages 27 and 28 of the Related Petition, as if Arcadia were one of the "Petitioners" as described therein.

(7) Arcadia hereby incorporates by reference, joins in and relies upon the Related Petition including, without limitation, the statement of points and authorities filed in support of the Related Petition.

(8) Arcadia understands and believes that, as set forth in Paragraph 79 of the Related Petition, a copy of a request to the Regional Board requesting the preparation of the Regional Board's record in connection with this matter, including a request for a copy of the audiotapes and the reporter transcripts of the January 26, 2000 hearing, as well as a request for a list of persons the Regional Board has identified as having an interest in the subject matter of this Petition, has been served on the Regional Board.

(9) This Petition has been set to Respondents Regional Board and its Executive Officer.

(10) Arcadia relies upon the matters as set forth in Paragraph 79 of the Related Petition with respect to the preparation of the Regional Board's record.

Arcadia hereby requests a Hearing pursuant to Title 23 CCR Section 2050(b). In support thereof, Arcadia relies upon the facts, allegations and matters set forth in the Related Petition including, without limitation, Paragraphs 76 through and including 78 thereof.

Pursuant to Title 23 CCR Section 2053, Arcadia seeks a stay of the action taken by the Regional Board and any subsequent action to be taken by the Executive Officer in imposing the Regional Board SUSMP, as that term is defined in the Related Petition, in clear violation of the terms of the Permit and state and federal law in order to avoid substantial harm to Arcadia. In support of its request for a stay, Arcadia relies upon the Related Petition including, without limitation, Paragraphs 80 through and including 86 thereof, and all documents filed by the Petitioners in the Related Petition in support thereof.

Please contact the undersigned with respect to any correspondence and other communication submitted to Arcadia concerning this Petition.

Very truly yours,

Stephen P. Deitsch

Stephen P. Deitsch
(California Bar No. 89318)
of Best Best & Krieger LLP
City Attorney
City of Arcadia

SPD:mfa

cc: The California Regional Water Quality Control Board
Los Angeles Region (via facsimile and U.S. Mail)
Dennis Dickerson, Executive Director
of the Los Angeles Regional Water Quality Control Board (via facsimile and U.S. Mail)

STEPHEN P. DEITSCH, Bar No. 089318
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Attorneys for Petitioner City of Arcadia

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BELL GARDENS, BURBANK, CERRITOS, COMMERCE, COMPTON, DIAMOND BAR, DOWNEY, HAWAIIAN GARDENS, HUNTINGTON PARK, INDUSTRY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRANDA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, MONTEBELLO, PALOS VERDES ESTATES, PARAMOUNT, PICO RIVERA, POMONA, RANCHO PALOS VERDES, ROSEMEAD, SAN GABRIEL, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, and CITY OF ARCADIA, a municipal corporation,

Petitioners,

vs.

THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; AND DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board.

Respondents.

Case No.

PETITIONER CITY OF ARCADIA'S POST-HEARING REPLY BRIEF TO JUNE 12, 2000 STATE BOARD INQUIRY

Hearing
Date: June 7-8, 2000
Time: 10:00 a.m.
Location: 3350 Civic Center Drive
Torrance, CA 90503

Petitioner, City of Arcadia, joins in the Brief filed on behalf of all other Petitioners in this matter on or about July 6, 2000 and in the "Petitioners' Proposed Revisions to Respondents' Standard Urban Storm Water Mitigation Plan for Los Angeles County and Cities in Los Angeles County" filed with the Brief. Furthermore, Petitioner City of Arcadia specifically concurs with that section of the Brief captioned, "V. CONCLUSION" and with the prayers, requests and recommendations set forth therein.

DATED: July 7, 2000

BEST BEST & KRIEGER LLP

By: Stephen P. Deitsch
STEPHEN P. DEITSCH
Attorney for Petitioner City of Arcadia

PROOF OF SERVICE

I, Monica F. Almore declare:

I am a resident of the State of California and over the age of eighteen years, and not a party to the within action; my business address is Best Best & Krieger LLP, 3750 University Avenue, Suite 400, P.O. Box 1028, Riverside, California 92502-1028. On July 7, 2000, I served the within documents:

PETITIONERS' POST-HEARING REPLY BRIEF TO JUNE 12, 2000 STATE BOARD INQUIRY

☐ by transmitting via facsimile the document(s) listed above to the fax number(s) set forth below on this date before 5:00 p.m.

☒ by placing the document(s) listed above in a sealed envelope with postage thereon fully prepaid, in the United States mail at Riverside, California addressed as set forth below.

☐ by causing personal delivery by of the document(s) listed above to the person(s) at the address(es) set forth below.

☐ by personally delivering the document(s) listed above to the person(s) at the address(es) set forth below.

☐ I caused such envelope to be delivered via overnight delivery addressed as indicated on the attached service list. Such envelope was deposited for delivery by **{Overnight Delivery Name Inserted Here}** following the firm's ordinary business practices.

See Attached Service List

I am readily familiar with the firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. Postal Service on that same day with postage thereon fully prepaid in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on July 7, 2000, at Riverside, California.

Monica F. Almore

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Attorneys for Western States
Petroleum Association

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Petition of WESTERN STATES PETROLEUM ASSOCIATION, Petitioner, For Review of the Los Angeles Regional Water Quality Control Board's January 26, 2000 Approval of the Standard Urban Stormwater Mitigation Plan Regulation	FILE NO. _____ PETITION FOR REVIEW OF THE REGIONAL WATER QUALITY CONTROL BOARD -- LOS ANGELES REGION'S JANUARY 26, 2000 APPROVAL OF THE STANDARD URBAN STORMWATER MITIGATION PLAN REGULATION

I. INTRODUCTION

The Western States Petroleum Association ("WSPA") requests that the State Water Resources Control Board ("State Board") review the Regional Water Quality Control Board -- Los Angeles Region's ("Regional Board") January 26, 2000 approval of the Standard Urban Stormwater Mitigation Plan ("SUSMP"). The Regional Board's failure to follow mandatory procedural requirements and failure to adequately consider the economic consequences of its action require that the State Board reverse the Regional Board's action. This petition is filed pursuant to California Water Code Section 13320 and Title 23, California Code of Regulations, Section 2050.

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II. INFORMATION REQUIRED BY SECTION 2050

In support of WSPA's Petition For Review, WSPA provides the following information as required by Title 23, California Code of Regulations, Section 2050:

A. The Petitioner is the Western States Petroleum Association, 505 N. Brand Blvd., Suite 1400, Glendale, California 91203.

B. Petitioner requests review of the Regional Board's January 26, 2000 approval of the SUSMP regulation which, among other requirements, mandates treatment control best management practices including numeric design standards. These standards would impact a number of project categories, including retail gasoline outlets. As of the date this petition was prepared, the final approved Regional Board resolution was not yet available from the Regional Board.

C. The Regional Board's approval of the SUSMP regulation occurred on January 26, 2000.

D. The Regional Board's action was improper for the following reasons: 1) The Regional Board's Mandate Of Specified Numerical Design Standards Without Properly Evaluating Their Economic Consequences Is Arbitrary, Capricious and Contrary to Law; 2) The Regional Board Did Not Allow Adequate Time For Public Review of Significant Changes To The Proposal; 3) The Regional Board Did Not Satisfy CEQA Requirements; 4) The Regional Board Has Not Complied with the Administrative Procedure Act; and 5) The Numeric Design Standards Are An Unfunded Mandate.

WSPA incorporates herein by reference the statement of points and authorities at Part II. G below. As the Regional Board has not yet made its final approved order available, additional grounds for review of the Regional Board action may be discovered at a later date. If needed, further details regarding the Regional Board's action and the grounds for review will be provided in supplemental pleadings.

E. WSPA is a trade association representing approximately thirty companies engaged in all aspects of the exploration for, production, refining, transportation and marketing of petroleum and petroleum products in the Western United States. WSPA is aggrieved by the Regional Board's action because many of its members own or operate retail gasoline stations in the portion of

California that will be impacted by the SUSMP regulation's mandatory requirements on retail gasoline outlets. In particular, the SUSMP regulation's numeric design standards will impose significant unnecessary costs and expenses on these WSPA members during the construction of new retail gasoline outlets. In addition, WSPA, as an advocate for its members, has an interest in ensuring that the Regional Board's orders and regulations are reasonable and in compliance with applicable legal requirements.

F. WSPA requests the State Board either delete the numeric design standards applicable to retail gasoline outlets from the Regional Board's order or that the State Board remand the matter to the Regional Board with directions to do the same, and requests such other relief as any subsequently discovered facts may indicate is appropriate.

G. WSPA provides the following statement of points and authorities in support of this Petition. As the Regional Board has not yet issued its final approved order with respect to this matter, additional grounds for review of the Regional Board's action may be discovered at a later date. If needed, supplemental Points and Authorities will be submitted.

Several procedural and substantive defects in the Regional Board's action require the reversal of the Regional Board's approval of the SUSMP regulation and the mandated numeric design standards applicable to retail gasoline outlets. Each of these defects is described below.

1. The Regional Board's Mandate Of Specific Numerical Design Standards Without Properly Evaluating Their Economic Consequences Is Arbitrary, Capricious and Contrary to Law.

The Regional Board must evaluate "economic considerations" when establishing waste discharge requirements and water quality standards. Water Code Sections 13241(d) and 13263(a). In addition, the Regional Board is prohibited from specifying the "design, location, type of construction, or particular manner" for compliance with a Regional Board requirement or order. Water Code § 13360(a). Contrary to this authority, the SUSMP regulation requires implementation of specified numeric design requirements to mitigate storm water runoff. The Regional Board performed no analysis to determine whether any of the specified numerical design standards would be economically achievable or reasonable if applied to retail gasoline outlets. The evidence before the Regional Board showed that such numeric standards were unnecessary, expensive and would

provide little or no environmental benefit. In fact, that evidence indicated that such standards could result in an environmental detriment. Because the Regional Board had no basis to show that the numerical design standards were economically reasonable or practicable, the Regional Board's application of such requirements to retail gasoline outlets is arbitrary, capricious and contrary to its authority.

2. The Regional Board Did Not Allow Adequate Time For Public Review of Significant Changes to The Proposal.

The 19-page Staff Report and Record of Decision supporting the proposal was only released on January 18, 2000 -- just eight days before the Regional Board's action. In addition, a Change Sheet containing significant substantive modifications to the proposal was released on Friday, January 21, 2000 and the revised version of the proposal was not made available to the public before the Regional Board hearing. By delaying the release of these key documents, the Regional Board violated due process by depriving affected members of the public of an adequate opportunity to review and comment.

Moreover, the short time period allowed for public review of these critical documents is contrary to the public review requirements contained in the Regional Board's prior Order No. 96-054. That order required a 45-day period for interested parties to submit comments and provided the Executive Officer with a 120-day period to consider the proposal and comments before reaching its decision. Due to the late release of key documents, the Regional Board's staff prevented the requirements of Order No. 96-054 from being fulfilled and the public was deprived of the opportunity to meaningfully participate in the agency's process.

3. The Regional Board Did Not Satisfy CEQA Requirements.

The Regional Board's action will have a significant impact on the environment because it would require many new construction projects to submit an Urban Storm Water Mitigation Plan for approval and implement specific post-construction controls, which, in the case of retail gasoline outlets at least, could have potentially significant adverse effects on groundwater. Since the proposed numerical design standards are not federally required and they will significantly affect the

environment, the Regional Board must follow CEQA requirements if it wishes to adopt such standards.

The Regional Board's Staff Report incorrectly suggested that the proposed numerical design standard is federally required by Section 402(p) of the Clean Water Act. Contrary to the Regional Board's interpretation, the Clean Water Act does not require municipal stormwater discharges to comply with numeric limitations -- any such requirements are discretionary. Defenders of Wildlife v. Browner, 191 F.3d 1159, 1166-67 (9th Cir. 1999). Therefore, the Regional Board's adoption of numerical design standards, if authorized at all, must be through its State authority.

The Regional Board's Staff Report asserted that the proposed regulation is exempt from CEQA by reason of Water Code Section 13389, however, that section only exempts the adoption of federally-mandated waste discharge requirements and permits. See Water Code § 13372; Committee for a Progressive Gilroy v. State Water Resources Control Bd., 192 Cal. App. 3d 847 (1987). As noted, since numeric design standards are not federally-mandated, CEQA review of the SUSMP regulation is required.

4. The Regional Board Has Not Complied with the Administrative Procedure Act.

The Regional Board did not follow the requirements of the California Administrative Procedure Act (APA). The APA applies because the numeric design standards are a standard of general application which meets the APA definition of a regulation. See Government Code Section 11342. Contrary to the assertion in the Regional Board's Staff Report, Government Code Section 11352(b) does not exempt the proposal from the APA because this provision only exempts required "waste discharge requirements and permits" and, as described above, neither federal nor state law requires numeric design standards to be included in permits. Therefore, the Regional Board's adoption of the numeric design standards is a quasi-legislative action and the APA applies. Moreover, the Regional Board Staff Report's assertion that any challenge to the Regional Board's action would be untimely is ludicrous. The numerical design standards were added to the proposed SUSMP regulation shortly before it was adopted and the Regional Board's final approved order evidencing such action has not yet even been finalized.

5. The Numeric Design Standards Are An Unfunded Mandate.

The proposed numeric design standards also constitute an unfunded mandate prohibited by the California Constitution. See Cal. Constitution Art. 13B § 6. Since the numeric design standards are not required by any federal law and have been adopted through a discretionary exercise of authority by the Regional Board, the limits are not "costs mandated by the federal government." Government Code Section 17513. Consequently, since the numeric design standards do not qualify as a federal mandate, the Regional Board's order is invalid because it does not provide for appropriate funding.

H. A list of persons known by the Regional Board to have an interest in this matter was requested from the Regional Board, but not available at the time this petition was prepared. A copy of a February 24, 2000 letter to the Regional Board requesting this list is attached hereto as Exhibit A.

I. A copy of this petition has been sent to the Regional Board.

J. A copy of a request by WSPA to prepare the Regional Board record on this matter is attached hereto as Exhibit A.

III. CONCLUSION

For the foregoing reasons, WSPA respectfully requests that the State Board grant this petition.

DATED: February 24, 2000

Respectfully submitted,

Gregory R. McClintock
Lyman C. Welch
MAYER, BROWN & PLATT

Attorneys for WESTERN STATES PETROLEUM ASSOCIATION

By: Lyman C. Welch

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MAYER, BROWN & PLATT

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February 24, 2000

VIA FACSIMILE AND U.S. MAIL

Los Angeles Regional Water Quality Control Board
320 West Fourth Street
Suite 200
Los Angeles, CA 90013

Re: Request for Preparation of the Regional Board Record of the January 26, 2000 SUSMP Approval

Dear Sir or Madam:

On behalf of the Western States Petroleum Association, this letter constitutes a request pursuant to Title 23, California Code of Regulations, section 2050 for the preparation of the record from the Regional Board's January 26, 2000 approval of the Standard Urban Stormwater Mitigation Plan, including the transcript of the Board hearing of that date, if available.

In addition, we request a copy of the Regional Board's list of parties known to have an interest in the SUSMP proceeding. We understand that one or more other petitions for review are being filed as well and it is not our intention to require duplicative work. If convenient, you can simply provide us with a copy of whatever you provide to the other petitioners.

Sincerely,

Lyman C. Welch

Lyman C. Welch

LCW/jm

EXHIBIT
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February 24, 2000

VIA FACSIMILE AND U.S. MAIL

Los Angeles Regional Water Quality Control Board
320 West Fourth Street
Suite 200
Los Angeles, CA 90013

Re: Request for Preparation of the Regional Board Record of the January 26, 2000 SUSMP Approval

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In addition, we request a copy of the Regional Board's list of parties known to have an interest in the SUSMP proceeding. We understand that one or more other petitions for review are being filed as well and it is not our intention to require duplicative work. If convenient, you can simply provide us with a copy of whatever you provide to the other petitioners.

Sincerely,

Lyman C. Welch

Lyman C. Welch

LCW/jm

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Attorneys for Petitioner
WESTERN STATES PETROLEUM ASSOCIATION

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Petition of WESTERN STATES PETROLEUM ASSOCIATION, Petitioner, For Review of the Los Angeles Regional Water Quality Control Board's January 26, 2000 Approval of the Standard Urban Stormwater Mitigation Plan Regulation	FILE NO. A-1280(b) **AMENDMENT TO WESTERN STATES PETROLEUM ASSOCIATION'S PETITION FOR REVIEW OF THE REGIONAL WATER QUALITY CONTROL BOARD – LOS ANGELES REGION'S JANUARY 26, 2000 APPROVAL OF THE STANDARD URBAN STORMWATER MITIGATION PLAN REGULATION**

The Western States Petroleum Association ("WSPA") hereby amends its petition, pending before the State Board pursuant to California Water Code Section 13320 and Title 23, California Code of Regulations, Section 2050, for review of the January 26, 2000 action of the Los Angeles Regional Water Quality Control Board ("Regional Board") approving the Standard Urban Stormwater Mitigation Plan ("SUSMP") regulation. WSPA files this amendment to ensure that the subsequent actions by the Executive Officer of the Regional Board and the final approved SUSMP regulation are deemed to be covered by WSPA's petition. In support of this amendment, WSPA states as follows:

1. On March 8, 2000, the Executive Officer of the Regional Board approved the final SUSMP regulation as directed by the January 26, 2000 resolution of the Regional Board. On or about

this date, the Executive Officer also released copies of the final approved SUSMP regulation and the January 26, 2000 Regional Board Resolution No. R-00-02 to the public. A copy of Regional Board Resolution No. R-00-02 is attached hereto as Exhibit A. A copy of the final Approved Standard Urban Stormwater Mitigation Plan for the Los Angeles Region is attached hereto as Exhibit B.

2. The Executive Officer made significant changes to the final SUSMP regulation which were not the subject of public review and which are not supported by the administrative record. Such significant changes include, without limitation, expansion of the definition of a "retail gasoline outlet" and elimination of the credit for roofing surface area that had previously been authorized in calculating stormwater runoff volume. The Regional Board's March 8, 2000 summary of several of these significant changes to the SUSMP regulation is attached hereto as Exhibit C.

3. The Executive Officer's approval of the final SUSMP regulation, the adoption of significant changes to the SUSMP regulation and Regional Board Resolution No. R-00-02 each suffer from the same procedural and substantive defects set forth in WSPA's original Petition for Review. WSPA incorporates by reference all of the information in its original Petition for Review, including the information required by Section 2050, as if set forth fully herein.

4. A copy of this filing has been sent to the Regional Board.

FOR THE FOREGOING REASONS, WSPA respectfully requests that the State Board grant this amended petition.

DATED: April 6, 2000

Respectfully submitted,

MAYER, BROWN & PLATT
GREGORY R. McCLINTOCK
LYMAN C. WELCH

By: Lyman C. Welch
Lyman C. Welch

Attorneys for Petitioner
WESTERN STATES PETROLEUM ASSOCIATION

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION

Resolution No. R-00-02

APPROVING THE
STANDARD URBAN STORM WATER MITIGATION PLAN
FOR
MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS
IN LOS ANGELES COUNTY

WHEREAS, THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FINDS:

1. On July 15, 1996, a municipal separate storm sewer system permit (Los Angeles County MS4 Permit) was issued to the County of Los Angeles and 85 incorporated cities to control and minimize the discharge of pollutants associated with storm water and urban runoff. This permit became Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles.

2. On June 30, 1999, a municipal storm water permit was issued to the City of Long Beach (City of Long Beach MS4 Permit) which removed the City of Long Beach from Board Order No. 96-054, giving the City of Long Beach its own distinct Municipal Storm Water and Urban Runoff NPDES permit, Regional Board Order No. 99-060, "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the City of Long Beach".

3. On August 19, 1999, a statewide general storm water permit for construction activity (Statewide Construction Storm Water Permit) was adopted by the State Water Resources Control Board (State Board). This permit became State Board Order No. 99-08-DWQ, and applies to construction projects that disturbs five acres or more or is part of a larger common plan of sale in the Los Angeles region.

4. Many of the rivers and streams in Los Angeles County are formally designated as impaired, pursuant to Section 303 (d) of the federal Water Pollution Control Act, for specific pollutants that are commonly found in storm water and urban runoff.

5. Storm water runoff carries with it many pollutants in varying concentrations that are suspended in, and or dissolved, in the runoff. The sources of these pollutants include nearly all properties that have been developed since the pollutants originate through the many diverse activities of habitation and land use. Pollutants generated from individual property developments vary greatly in the concentration or loading of each pollutant. Generally, the relative contribution of the pollutant from runoff from any individual property development will represent only a small portion of the entire loading of a water body given the many square miles of land upon which storm water runoff is generated. When the individual contributions from tens of thousands of discrete property units are aggregated, the pollutant loading becomes significant. The resultant pollutant loads results in the impairment of that water body and the conveyance of pollutants, including sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides to the ocean and harbors within Los Angeles County. The loading of pollutants generated in the Los Angeles area are being measured through the monitoring program being conducted by the Los Angeles County Department of Public Works in conformance with its obligations as the Principal Permittee under the Los Angeles CountyMS4 Permit.

EXHIBIT
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6. The nature of property use is related to the types and quantities of pollutants that are transported from that property during a rainfall event.

7. As property is developed or redeveloped, the utilization of Best Management Practices provide an opportunity to reduce the loading of pollutants to water bodies. This is accomplished by various techniques and can be passive (source reduction) or active (treatment). As property is developed from undisturbed lands, the project can be designed to incorporate Structural or Treatment Control (Best Management Practices (BMPs) that would normally not be available or practical to use on property that has been in urban use.

8. BMPs are effective means of reducing pollutants and Structural or Treatment Control BMPs can be "designed-into" a project in a cost effective way and in a manner that is either transparent to or which enhances the use to which the property has been placed. Some BMPs encourage the setting aside of areas as a greenbelt to allow storm water runoff to flow over areas which are permeable, thereby allowing all or a portion of the runoff to infiltrate. Other BMPs can be designed and built into structures such as catch basins that incorporate replaceable filters to absorb oily wastes or by installing screens to prevent litter from passing through the system and into the water body.

9. Arrays of Structural or Treatment control BMPs are available to developers of both new and redevelopment properties. The use of BMPs is already required by the terms of the Los Angeles County and Long Beach Municipal Storm Water and Urban Runoff NPDES permits.

10. The ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time. A BMP that can only be effective for a small volume of storm water runoff is inherently less effective than one sized to accommodate a larger volume of water.

11. Storm water runoff will normally convey a disproportionate loading of pollutants in the initial period runoff is generated during a storm event. Storm events generating up to 0.75 inches of precipitation, measured over a 24-hour period, constitute 85 percent of the total amount of runoff that can be expected during an average wet season. Designing a BMP to be able to accommodate this amount of runoff will result in the application of a BMP intervention to all but 15% of the total runoff during a year, and usually all of the critical runoff that occurs in the early phase of the precipitation event, commonly referred to as the "first Flush."

12. Both the Los Angeles County MS4 Permit (Part III.A.1.c) and the City of Long Beach MS4 Permits contain provisions related to the adoption of Standard Urban Storm Water Mitigation Plans (SUSMPs) requiring their development and implementation.

13. Standard Urban Storm Water Mitigation Plans are required for a specified set of enumerated projects and the permit specifically identifies seven distinct categories for which SUSMPs are required to be prepared. The permit specifically states that the seven categories of projects are the minimum categories requiring SUSMPs.

14. Standard Urban Storm Water Mitigation Plans are also required for development or redevelopment of Parking Lots 5,000 square feet or greater and Locations in Environmentally Sensitive Areas. These categories have been added to advance efforts to control storm water pollution beyond the minimum in Los Angeles County.

15. Standard Urban Storm Water Mitigation Plans are required to be approved by the Regional Board Executive Officer following which they are to be implemented by the Permittees and used by the Permittees as the minimum criteria for the approval of project specific Urban Storm Water Mitigation Plans and the issuance of grading or building permits to project applicants.

16. The Statewide Construction Storm Water Permit requires that Storm Water Pollution Prevention Plans (State SWPPPs) contain post-construction BMPs that will be implemented after construction is complete.

R0072733

17. Section 402 (p) of the Clean Water Act requires the Administrator of the United States Environmental Protection Agency or her designated agent, in this instance, the Regional Board, to require as part of the storm water program "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [USC Section 1342 (p)(3)(B)].

18. A recent decision of the United States 9th Circuit Court of Appeals, *Defenders of Wildlife v. Browner* (1999) Case No. 98-71080, provides additional support and clarification of the authority of the Administrator and the Regional Board to impose additional controls on storm water pollution. The Court in *Defenders of Wildlife v. Browner* said that the USEPA and the States have discretion under the law to determine what pollution controls are appropriate to achieve compliance.

19. Pursuant to the requirements of Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, the Regional Board Executive Officer received a proposal for Standard Urban Storm Water Mitigation Plans submitted by the Principal Permittee.

20. Upon the review of the Regional Board Executive Officer, the Standard Urban Storm Water Mitigation Plan submitted for the seven applicable categories was deemed inadequate. A revised SUSMP proposal was developed subsequent to a discussion of the proposal's conceptual foundation at a public workshop held on August 10, 1999. This workshop was well attended with over 80 municipal representatives and interested parties participating.

21. On August 16, 1999, a public notice was issued indicating that the Standard Urban Storm Water Mitigation Plans proposed by the Principal Permittee would be augmented by the addition of criteria related to specifying numerical design criteria for BMP construction. The matter was noticed for the Regional Board's September meeting to allow the issue to be discussed before the Board although no formal action of the Regional Board itself is required for SUSMP approval.

22. On September 16, 1999, the Regional Board conducted a public hearing on the Standard Urban Storm Water Mitigation Plan proposal as amended by the Executive Officer. At that hearing, the Regional Board Executive Officer suggested additional time would be necessary to develop a more comprehensive proposal incorporating the comments received at the public hearing.

23. Between September 16, 1999 and January 25, 2000, the Regional Board Executive Officer met with interested parties to discuss comments and concerns from interested parties.

24. The Southern California Council of Governments (SCAG) has indicated its interest in obtaining funding to prepare a regional plan(s) to address storm water pollution and identify regional treatment solutions for implementation.

25. On December 7, 1999, the Regional Board Executive Officer released a revised Standard Urban Storm Water Mitigation Plan document to interested parties.

THEREFORE BE IT RESOLVED THAT:

1. The Regional Board endorses the Standard Urban Storm Water Mitigation Plan prepared by the Regional Board Executive Officer and noticed to the public on December 7, 1999 and the concepts therein relating to numerical storm water mitigation standards for Best Management Practices; and

2. The Regional Board directs the Regional Board Executive Officer to approve the Standard Urban Storm Water Mitigation Plan at the earliest opportunity incorporating changes made and formally approved by the Regional Board at the January 26, 1999 Board Hearing;

3. The Regional Board adopts the approved requirements as provisions applicable to the SUSMP requirements for the City of Long Beach.

4. The Regional Board adopts the numerical mitigation standards for storm water, endorsed herein, as the minimum design criteria for review of post-construction BMPs in the Los Angeles Region for construction projects subject to coverage under the Statewide Construction Storm Water Permit.

5. The Regional Board encourages the Permittees and all interested parties to work together in a spirit of cooperation to effect the implementation of the Standard Urban Storm Water Mitigation Plan at the earliest possible date, and

6. The Regional Board encourages the efforts by the Southern California Council of Governments and area Council of Governments (COGs) to develop regional plans and identify regional solutions to address storm water pollution from new development and redevelopment.

I, Dennis Dickerson, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 26, 2000.

ORIGINAL SIGNED BY

DENNIS A. DICKERSON
Executive Officer

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

Final
Approved – Regional Board Executive Officer
March 8, 2000.

R0072736

EXHIBIT

B

LOS ANGELES COUNTY URBAN RUNOFF AND STORM WATER NPDES PERMIT

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Los Angeles County Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit (City of Long Beach MS4 Permit), which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

1. Effectively prohibit non-storm water discharges, and
2. Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable (MEP statutory standard).

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. The Permittees are required to adopt the requirements set herein in their own SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve the project plan as part of the development plan approval process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

All projects that fall into one of seven categories are identified in the Los Angeles County MS4 Permit as requiring SUSMPs. These categories are:

- Single-Family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements for the Los Angeles County MS4 Permit. These categories are:

- Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and
- Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

The City of Long Beach permit requires SUSMP for the following categories only: (i) 10-99 home subdivisions; (ii) 100 or more subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) Projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Plan.

Permittees shall amend codes and promulgate ordinances not later than September 8, 2000, to give legal effect to the SUSMP requirements. The SUSMP requirements for projects identified herein shall take effect not later than October 8, 2000.

DEFINITIONS

"100,000 Square Foot Commercial Development" means any commercial development that creates at least 100,000 square feet of impermeable area, including parking areas."Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Commercial Development" means any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

"Directly Connected Impervious Area (DCIA)" means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g. lawns).

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

"Environmentally Sensitive Area" means an area designated as an Area of Special Biological Significance by the State Water Resources Control Board (*Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (1994) and amendments) or an area designated as an Area of Ecological Significance by the County of Los *Angeles (Los Angeles County Significant Areas Study, Los Angeles County Department of Regional Planning (1976)* and amendments) or an area designated as a significant natural area by the California Resources Agency. Refer to Table 3 for a listing.

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater.

"Infiltration" means the downward entry of water into the surface of the soil.

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

"Parking Lot" means land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with a lot size of 5,000 square feet or more, or with 25 or more parking spaces.

"Redevelopment" means, on an already developed site, the creation or addition of at least 5,000 square feet of impervious surfaces or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces.

"Restaurant" means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812).

"Retail Gasoline Outlet" means any facility engaged in selling gasoline and lubricating oils.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Storm Event" means a rainfall event that produces more than 0.1 inch of precipitation and that, which is separated from the previous storm event by at least 72 hours of dry weather.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes, (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMP to be consistent with the code, except that to the extent that the standards in the SUSMP are more stringent than those under local codes, such more stringent standards shall apply.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system. The development must be designed so as to minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*;

The Maryland Stormwater Design Manual; *Florida Development Manual: A Guide to Sound Land and Water Management*; Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices* and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* , USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants.

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

Project plans must include BMPs consistent with local codes and ordinances and the SUSMP to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Utilize natural drainage systems to the maximum extent practicable
- Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the storm water conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be

stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system, the following Structural or Treatment BMPs are required:

- Materials with the potential to contaminate storm water must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- The storage area must have a roof or awning to minimize collection of storm water within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following Structural or Treatment Control BMP requirements (individual single family residences are exempt from these requirements):

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included or is required to include, Structural or Treatment Control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, the verification will include the developer's signed statement, as part of the project application, accepting responsibility for all structural and treatment control BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance. The transfer of property to a private or public owner must have conditions requiring the recipient to assume responsibility for maintenance of any Structural or Treatment Control BMP to be included in the sales or lease agreement for that property, and will be the owner's responsibility. The condition of transfer shall include a provision that the property owners conduct maintenance inspection of all Structural or Treatment Control BMPs at least once a year and retain proof of inspection. For residential properties where the Structural or Treatment Control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&Rs). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what storm water management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. The transfer of this information shall also be required with any subsequent sale of the property.

If Structural or Treatment Control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Structural or Treatment Control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR STRUCTURAL OR TREATMENT CONTROL BMPs

Structural or Treatment control BMPs selected for use at any project covered by this

SUSMP shall meet the design standards of this Section unless specifically exempted.

Post-construction Structural or Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 80 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or

3. the volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

Limited Exclusion

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical Structural or Treatment Control BMP design standard requirement only.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

REQUIREMENTS

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. The area in the site design must be:

- Self-contained and/ or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

The activity of outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for the

washing/steam cleaning of equipment and accessories. This area must be:

- Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- The fuel dispensing area should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- The fuel dispensing areas must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all wash-water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. This area must be:

- Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor-vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL CONTAMINATION AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. A waiver of impracticability shall be granted only when all other Structural or Treatment Control BMPs have been considered and rejected as infeasible. Recognized situations of impracticability include, (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately petitioned by the Permittee and submitted to the Regional Board for consideration. The Regional Board may consider approval of the waiver justification or may delegate the authority to approve a class of waiver justifications to the Regional Board Executive Officer. The supplementary waiver justification becomes recognized and effective only after approval by the Regional Board or the Regional Board Executive Officer. A waiver granted by a Permittee to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPs

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

In lieu of conducting detailed BMP review to verify Structural or Treatment Control BMPs adequacy, a Permittee may elect to accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria established herein. The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date. Training conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, or the California Water Environment Association) may be considered qualifying.

14. RESOURCES AND REFERENCE

TABLE 1

SUGGESTED RESOURCES	HOW TO GET A COPY

Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different storm water-filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of Structural BMPs, Treatment Control, BMPs and Source Control BMPs	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

TABLE 1 (Continued)

SUGGESTED RESOURCES	**HOW TO GET A COPY**

Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988) Presents detailed guidance for designing BMPs	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Texas Nonpoint Source Book – Online Module (1998)www.txnpsbook.org Presents BMP design and guidance information on-line	Texas Statewide Storm Water Quality Task Force North Central Texas Council of Governments 616 Six Flags Drive Arlington, TX 76005 817-695-9150
Urban Storm Drainage, Criteria Manual – Volume 3, Best Management Practices (1999) Presents guidance for designing BMPs	Urban Drainage and Flood Control District 2480 West 26th Avenue, Suite 156-B Denver, CO 80211 303-455-6277
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA–840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
National Stormwater Best Management Practices (BMP) Database, Version 1.0 Provides data on performance and evaluation of storm water BMPs	American Society of Civil Engineers 1801 Alexander Bell Drive Reston, VA 20191 703-296-6000

SUGGESTED RESOURCES	HOW TO GET A COPY
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

TABLE 2

EXAMPLE BEST MANAGEMENT PRACTICES (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.
- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended/dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil/Water separators
- Catch basin inserts
- Continuous flow deflection/ separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage/ separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

TABLE 3

HABITAT PROTECTION IN THE LOS ANGELES COUNTY AREA

Agency:
State Water Resources Control Board

Designation:
Areas of Significant Biological Significance (ASBS)

Definition:
Areas designated by the State Water Resources Control Board as requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable.

Affected Area:
(See Table 1 & Figure 2)

Agency:
Los Angeles County Department of Regional Planning

Designation:
Significant Ecological Areas (SEA)

Definitions:
Significant Ecological Areas (SEAs) are areas that have been identified by the Los Angeles County General Plan as containing unique or unusual species assemblages, or areas of habitat that are rapidly declining in the Los Angeles County. The SEAs were established to protect a special or sometimes unique collection of habitats and species from loss due to encroachment and human disturbances. However, SEAs are not intended to function as isolated preservation areas.

Affected Areas:
(See Table A & Figure 1)

Agency:
California Department of Fish & Game

Designation:
Natural Communities Conservation Plan Region (NCCP)

Definition:
Identifies and provides for the regional or area wide protection and perpetuation of natural wildlife diversity, while allowing compatible and appropriate development and growth. The goal of the program is to protect sufficient resources in regional preserves to assure the survival of the ecosystem and, at the same time, permit compatible uses of less sensitive land.

Affected Area:
(See Table 1 & Figure 3)

TABLE 3 A

HABITAT PROTECTION IN LOS ANGELES COUNTY AREA1

Figure 1	AFFECTED AREA	DESIGNATION	DESIGNATING AGENCY
1.	Malibu Coastline	SEA	LACDRP
2.	Point Dume	SEA	LACDRP
3.	Zuma Canyon	SEA	LACDRP
4.	Upper La Sierra Canyon	SEA	LACDRP
5.	Malibu Canyon and Lagoon	SEA	LACDRP
5.	Malibu Creek State Park Buffer Area	SEA	LACDRP
6.	Las Virgenes	SEA	LACDRP
7.	Hepatic Gulch	SEA	LACDRP
9.	Cold Creek	SEA	LACDRP
10.	Tuna Canyon	SEA	LACDRP
11.	Temescal-Rustic-Sullivan Canyons	SEA	LACDRP
12.	Palo Comado Canyon	SEA	LACDRP
13.	Chatsworth Reservior	SEA	LACDRP
14.	Simi Hills	SEA	LACDRP
15.	Tonner Canyon/Chino Hills	SEA	LACDRP
16.	Buzzard Peak/ San Jose Hills	SEA	LACDRP
17.	Powder Canyon/Punte Hills	SEA	LACDRP
18.	Way Hills	SEA	LACDRP
19.	San Francisquito Canyon	SEA	LACDRP
20.	Santa Susana Mountains	SEA	LACDRP
21.	Santa Susana Pass	SEA	LACDRP
22.	Santa Fe Dam Floodplain	SEA	LACDRP
23.	Santa Clara River	SEA	LACDRP
24.	Tujunga Valley/Hansen Dam	SEA	LACDRP
25.	San Dimas Canyon	SEA	LACDRP
26.	San Antonio Canyon Mouth	SEA	LACDRP
27.	Portuguese Bend Landslide	SEA	LACDRP
28.	El Segundo Dunes	SEA	LACDRP
29.	Ballona Creek	SEA	LACDRP
30.	Alamitos Bay	SEA	LACDRP
31.	Rolling Hills Canyons	SEA	LACDRP
32.	Agua Amarga Canyon	SEA	LACDRP
33.	Terminal Island	SEA	LACDRP
34.	Palos Verdes Peninsula Coastline	SEA	LACDRP
35.	Harbor Lake Regional Park	SEA	LACDRP
36.	Madrona Marsh	SEA	LACDRP
37.	Griffith Park	SEA	LACDRP
39.	Encino Reservoir	SEA	LACDRP
40.	Verdugo Mountains	SEA	LACDRP

1 This list is a compilation of data from the Department of Fish & Game, State Water Resources Control Board, and the Los Angeles County Department of Regional Planning as of February 29, 2000. Areas in this may changes, as area are added or deleted by the designating agencies.

	AFFECTED AREA	DESIGNATION	DESIGNATING AGENCY
42.	Whittier Narrows Dam County Recreation Area	SEA	LACDRP
43.	Rio Hondo College Wildlife Santuary	SEA	LACDRP
44.	Sycamore and Turnbull Canyons	SEA	LACDRP
45.	Dudleya Densiflora Population	SEA	LACDRP
62.	Galium Grande Population	SEA	LACDRP
63.	Lyon Canyon	SEA	LACDRP
64.	Valley Oaks Savannah, Newhall	SEA	LACDRP
Fig.2	Point Dume to Latigo Point	ASBS	SWRCB
Fig.3	Palos Verdes Peninsula	NCCP	DFG

FIGURE 1

SIGNIFICANT ECOLOGICAL AREAS IN LOS ANGELES COUNTY

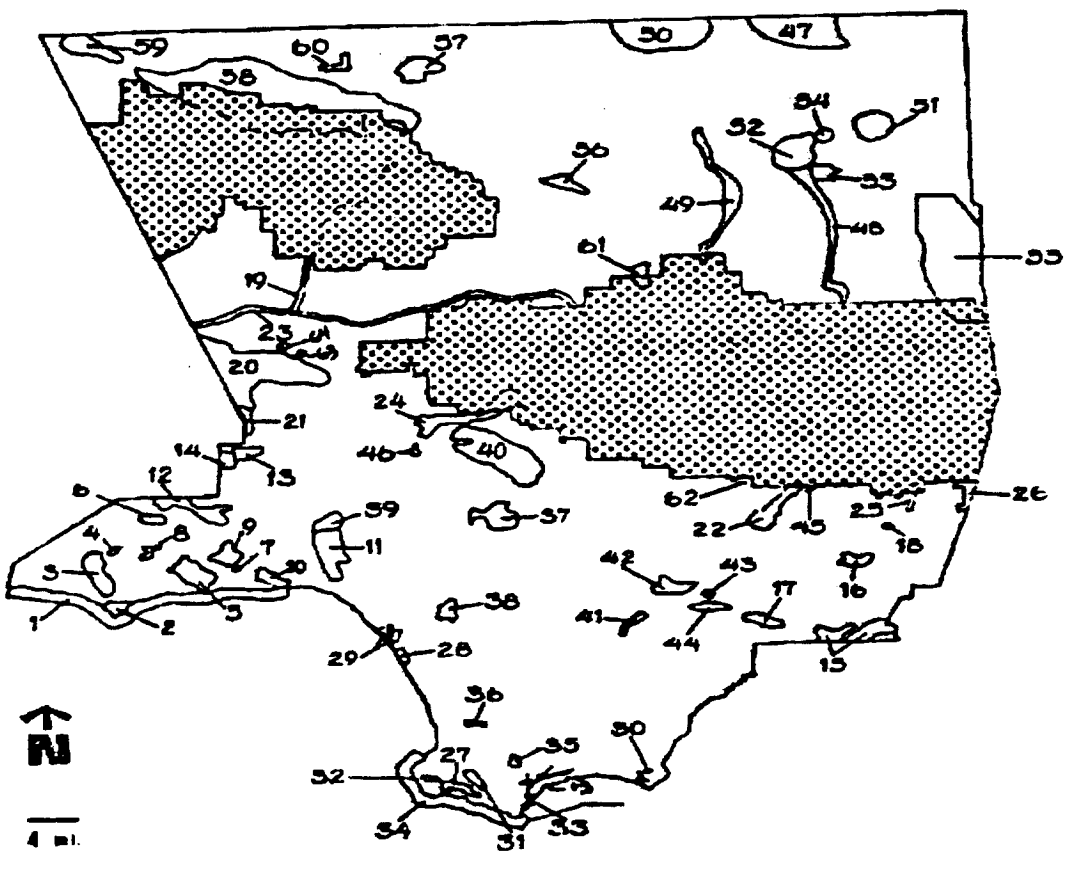


FIGURE 2

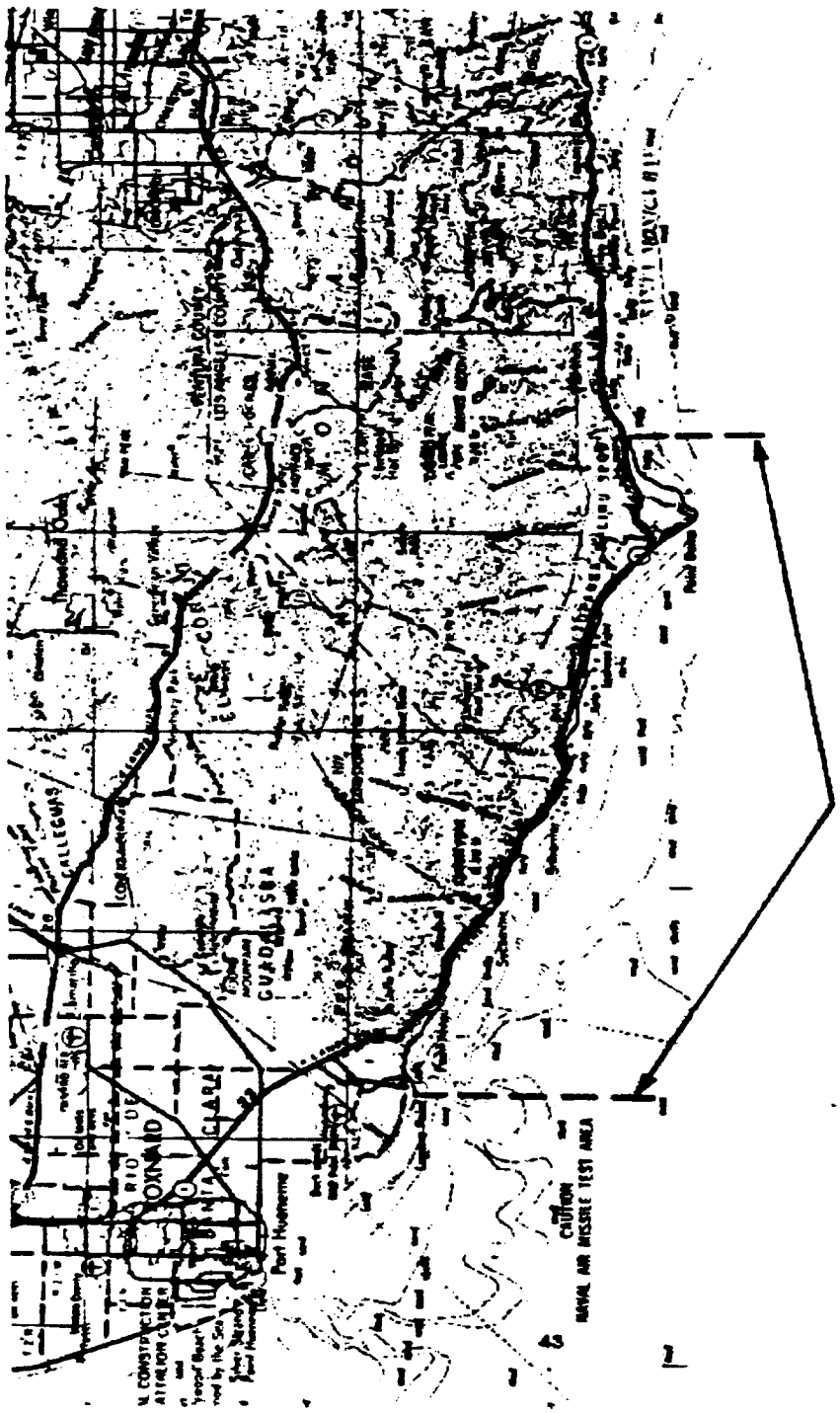
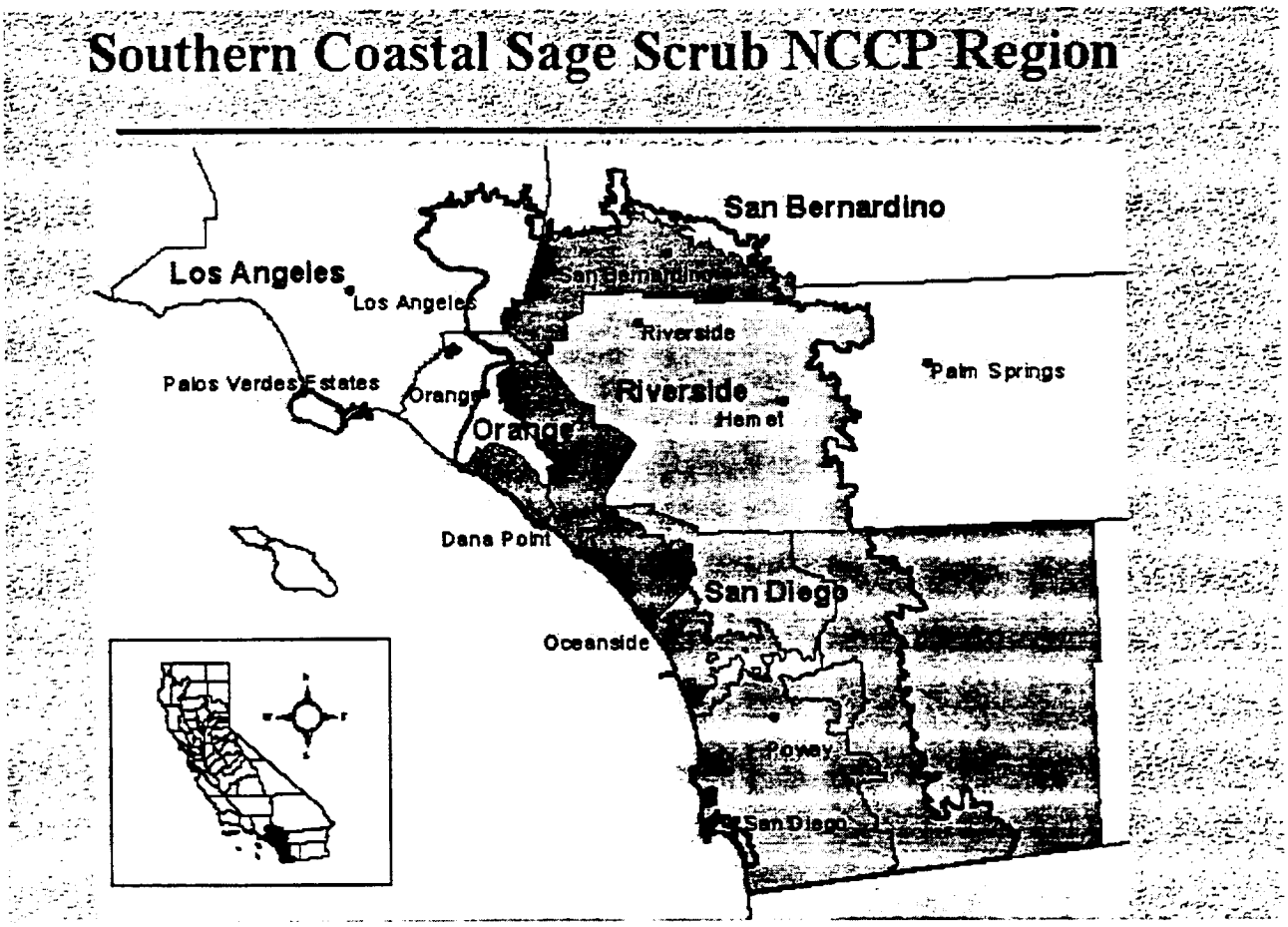


FIGURE 24
POINT MUGU TO LATIGO POINT
AREA OF SPECIAL BIOLOGICAL SIGNIFICANCE
Ref. Maps: USGS Point Mugu, CA
Point Dume, CA
Scale: 1 inch = 4 miles
Seaward boundary is 100-feet isobath or 1000 feet offshore, whichever is more distant.
(For enlarged delineation of boundary lines, SEE FIGURES 24a and 24b)

FIGURE 3


Southern Coastal Sage Scrub NCCP Region
San Bernardino
Los Angeles
Los Angeles
Riverside
Palm Springs
Palos Verdes Estates
Orange
Riverside
Hemet
Orange
Dana Point
San Diego
Oceanside
Poway
San Diego

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

LOS ANGELES REGION

STAFF REPORT AND RECORD OF DECISION

STANDARD URBAN STORM WATER MITIGATION PLANS

AND

NUMERICAL DESIGN STANDARDS FOR BEST MANAGEMENT PRACTICES

SUPPLEMENT

BOARD DIRECTED CHANGES

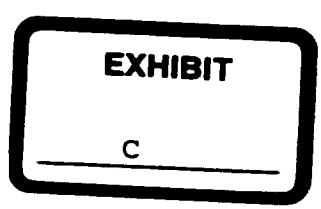
The Regional Board at its January 26, 2000, meeting directed the Regional Board Executive Officer to amend the Standard Urban Storm Water Mitigation Plans (SUSMPs) as indicated by the change sheet presented at the meeting (dated January 25, 2000), and changes directed by the Regional Board during the meeting. The Regional Board also adopted the same SUSMP requirements for the City of Long Beach under its separate municipal storm water permit (Board Order No. 99-060) for project categories that require SUSMPs.

Regional Board Counsel designated the record for the proceeding to include: i) all staff files and the transcript of proceedings for the January 26, 2000, Hearing; (ii) all staff files and transcript of proceedings for the September 16, 1999, Board Information Item Discussion; (iii) all staff files for the August 10, 1999, Workshop, (iv) all SUSMP Proposals circulated by the Permittees, (v) all SUSMP Proposals circulated by the Regional Board Staff, (vi) all comments received and responses; (vii) and all exhibits presented to the Board.

This "Supplement" document enumerates the significant changes made to the SUSMP that were directed by the Board at the hearing and the bases for the changes in the "Transcript of Proceedings", testimony presented or materials submitted to the Regional Board, and other relevant documents.

Applicability of the SUSMP

The SUSMP requirements apply to all projects in the nine enumerated categories for the Los Angeles County MS4 Program. While some development planning/ construction requirements in the permit are made applicable only to "Discretionary Projects", this limitation does not cover the seven "enumerated project categories" in Board Order No.



96-054, and the two additionally designated "enumerated project categories" by the Regional Board Executive Officer and affirmed by the Regional Board[1].

Applicability to Categories for the City of Long Beach

A statement has been added to clarify that SUSMP requirements adopted by the Regional Board apply to the City of Long Beach MS4 Program foronly: (i) 10-99 home subdivisions; (ii) 100 or more subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Plan.[2]

Effective Date for SUSMP Requirements

A statement has been included to provide Permittees 6 months from the date of Regional Board Executive Officer's approval of the SUSMP to amend ordinances and codes to be consistent with the adopted SUSMP requirements, and thence 30 days thereafter for the requirements to take effect.[3]

Definition of Commercial Development

The definition of "Commercial Development" has been reworded to be inclusive of all developments that are not considered "Residential" or "Heavy Industrial" based on the categorization of the federal storm water regulations.[4]

Definition of Environmentally Sensitive Areas

A new "Table 3" has been added to the SUSMP to list areas presently covered under the definition of "environmentally sensitive areas" based on readily ascertainable designations by the State Water Resources Control Board, the California Resources Agency, and the County of Los Angeles.[5]

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[1] Transcript of Proceedings, January 26, 2000 (CSR No. 10992 and 11568) at 228. Discussion by Regional Board Counsel Leon and direction by Board Member Cloke.

[2] Ibid. at 289. Clarification by Dr. Swamikannu and request by Board Member Cloke to include clear text to explain its applicability to the City of Long Beach.

[3] Ibid at 76 and 300. Recommendation by Mr. Dickerson responding to a question by Regional Board Chairman Nahai and affirmation by Board.

[4] Ibid at 66 and 285. Discussion by Board Members on the scope of the definition and response by Dr. Xavier Swamikannu.

[5] Ibid. at 206, 280, and 305. Discussion with Chairman Nahai and Dr. Coe of the ready ascertainibility of the designated sites, and agreement to provide a listing in the SUSMP.

Definition of Parking Lots

The definition of "Parking Lots " has been reworded to eliminate the "stand alone" limitation, so that it now applies to all parking lots with 5,000 square feet or more or with 25 parking spaces or more and exposed to storm water.[6]

Definition of Redevelopment

The definition of "Redevelopment" has been reworded to include a minimum threshold of at least 5,000 square feet of impervious area addition to an existing property in order for the SUSMP requirements to apply. The threshold value is consistent with other threshold values in the SUSMP, such as Parking Lots and Restaurants.[7]

Definition of Restaurant

The definition of "Restaurant" has been reworded to limit applicability to "stand-alone" facilities and exclude co-located stalls or food counters in general purpose establishments such as markets and grocery stores.[8]

Definition of Retail Gasoline Outlet

The definition of "Retail Gasoline Outlet" has been reworded to include all retail gasoline outlets that sell gasoline and lubricating oils without consideration of the proportion of receipts derived from such sales.[9]

Conflict with Local Practices

The paragraph has been reworded to allow local ordinances to differ from the SUSMP so long as they are more stringent.[10]

Responsibility and Conditions for BMP Transfer

The language has been modified to ensure that the responsibility for the maintenance of Structural or Treatment Control BMPs is properly transferred with the sale of a property and is mandatory.[11]

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[6] Ibid. at 301 and 306. Board Members Cloke and Diamond discuss and direct staff to eliminate the "stand-alone" limitation.

[7] Ibid. at 67 and 302. Board Chairman Nahai discusses the absence of a minimum threshold and directs staff to set a minimum value to address his concerns of proportionality aberrations.

[8] Ibid. at 68. Board Chairman interprets applicability and Dr. Swamikannu confirms the interpretation.

[9] Ibid. at 46, 49, 308. Board Members discuss the staff proposed definition based on primary activity and direct staff to extend the definition to include all gas stations that pump gas.

[10] Ibid. at 308. Board Members discuss the language and provide specific language for the purpose of local program consistency and to ensure adherence to the SUSMP requirements.

Roofing Surface Area Exclusion from Mitigation Standard

The roofing surface credit for calculation of storm water runoff volume for mitigation has been eliminated.[12]

Limited Exclusion for Small Restaurants from Mitigation Standard

The sentence has been clarified to state to exempt restaurants less than 5,000 square feet from the requirement to mitigate storm water only. All other requirements for restaurants apply.[13]

Waiver Provision

The paragraph has been modified to recognize proximity to an unconfined water table as one basis for the granting of a waiver.[14]

A sentence has been added to require that all other BMPs be considered and rejected before a waiver from the numerical mitigation standard is granted.[15]

A statement has been added to require that non-enumerated bases for waiver be brought to the Regional Board for consideration. The Regional Board can delegate the approval authority for a class of waivers to the Regional Board Executive Officer.[16]

---

[11] Ibid. at 63 and 313 Board Members discuss the significance of ensuring proper transfer of BMP maintenance responsibility and provide firm enabling language.

[12] Ibid. at 48 and 314. Board Members discuss the elimination of the rooftop exemption with the possibility of reconsideration in the future if Permittees affirmatively demonstrate that rooftop runoff is not a source of pollutants.

[13] Ibid. at 322. Board Members discuss the limited exclusion and agree with Dr. Swamikannu's rationale for the exclusion threshold from numerical design standards.

[14] Ibid. at. 60 Board Member Coe suggests the change to address the issue and Dr. Swamikannu accepts the suggestion.

[15] Ibid. 74 and 326 Board Members discuss the Waiver provision and provide language to ensure that all options for mitigation are considered.

[16] Ibid. at 75 and 328. Board Chairman Nahai provides direction to staff to require any new waiver bases to be brought to the Regional Board to ensure public discussion and consideration.

R0072764

MAYER, BROWN & PLATT

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TO: NAME/COMPANY: Richard Montevideo/Rutan & Tucker
TELEPHONE #: FAX #:1-714-546-9035

TO: NAME/COMPANY: Stephen P. Deitsch/Best Best & Krieger
TELEPHONE #: FAX #:1-909-686-3083

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LYMAN C. WELCH
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lwelch@mayerbrown.com

June 2, 2000

VIA FACSIMILE

Elizabeth Miller Jennings, Esq.
Office of Chief Counsel
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

Re: File Nos. A-1280, A-1280(a), and A-1280(b)

Dear Ms. Jennings:

In order to clarify the Pre-Hearing Submission on behalf of the Western States Petroleum Association (WSPA) and avoid any surprise at the hearing, please be advised that I, Lyman C. Welch, will appear before the Board on behalf of WSPA during the June 7th hearing in the above matter. On WSPA's behalf, I expect to present an introductory statement to the Board which will include the matters raised in WSPA's Petition and Pre-Hearing Submission and will also conduct cross-examination and present a closing argument (if allowed) on WSPA's behalf.

Sincerely,

Lyman C. Welch

Lyman C. Welch

LCW/jm

cc: Richard Montevideo, Esq.
Stephen P. Deitsch, Esq.
Dennis Dickerson, Executive Officer
David Beckman, Esq.

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STATE WATER RESOURCES CONTROL BOARD
CLERK TO THE BOARD
REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF ARTESIA, BELLFLOWER, BURBANK, CERRITOS, COMMERCE, DIAMOND BAR, DOWNEY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, PALOS VERDES ESTATES, PICO RIVERA, POMONA, RANCHO PALOS VERDES, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, Petitioners, vs. THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board, Respondents.	Case No. PETITIONERS' STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT OF LEGAL ISSUES IN PETITION OF ACTIONS AND INACTIONS OF THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, AND ITS EXECUTIVE OFFICER, DENNIS DICKERSON, PURSUANT TO ORDER NO. 96-054 (NPDES NO. CAS614001)

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I. INTRODUCTION

Petitioners herein file this Petition challenging the action taken by the Regional Water Quality Control Board, Los Angeles Region ("Regional Board") on January 26, 2000, and all related action taken or to be taken by its Executive Officer in connection therewith, concerning Order No. 96-054 (NPDES No. CAS614001) Waste Discharge Requirements for Municipal Storm Water and Urban Run Off Discharges within the County of Los Angeles (hereinafter "Permit," "Order," or "Order No. 96-054"). The Petition further challenges various "failures to act" on the part of the Respondents, namely their failures to comply with the Administrative Review Process under the Permit with respect to the Standard Urban Storm Water Mitigation Plan ("SUSMP") submitted by the Permittees under the subject Permit.[1]

Petitioners challenge the action taken by the Regional Board on January 26, 2000, the prior and subsequent actions of the Executive Officer in connection thereto, and the failures to act by the Respondents in reviewing and processing the Permittees' SUSMP program, for the following reasons: (1) Respondents failed to comply with the Administrative Review Process set forth in Order No. 96-054; (2) Respondents have no authority under the Permit, the Clean Water Act (33 U.S.C. § 1251 *et seq.*) or the Porter-Cologne Act (Cal. Water Code § 13000 et seq.) to mandate their own SUSMP program on the Permittees; (3) the actions taken by the Respondents violated the terms of the Permit, the Clean Water Act, and the Porter-Cologne Act; (4) Respondents failed to present evidence to support the costs effectiveness of the Regional Board SUSMP program and/or to show that the benefits to be obtained therefrom outweigh its costs; (5) Respondents failed to present credible evidence to show that the Regional Board SUSMP program will reduce pollutants to the maximum extent practicable; (6) Respondents' actions are in violation of California Water Code Section 13360; (7) Respondents' actions will result in the imposition of unfunded mandates in violation of the California Constitution; (8) the Regional Board's actions constitute regulations adopted in violation of the California Administrative Procedures Act; (9)

[1] The Points and Authorities supporting the legal issues in the Petition are set forth in the Petition itself. The following represents a summary of the Points and Authorities, and Petitioners submit this Statement of Points and Authorities, along with those Points and Authorities in the Petition, as their collective Statement of Points and Authorities in support of the legal issues raised in the Petition.

Respondents have failed to comply with the requirements of the California Environmental Quality Act ("CEQA"); and (10) Respondents have failed to provide proper notice of their proposed actions and have failed to provide Petitioners sufficient opportunity to be heard thereby depriving Petitioners of a fair hearing and due process of law.

For the foregoing reasons, as further set forth below and in the Petition itself, Petitioners respectfully request that the actions taken by the Regional Board and its Executive Officer be overturned and that the Executive Officer be required to take action on the Permittees' SUSMP in accordance with the requirements of Order No. 96-054.

II. BACKGROUND

On July 15, 1996, Respondent Regional Board issued Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, to all municipalities within the County. Under the Permit, the City Petitioners and all other Permittees thereunder were required to submit a SUSMP to the Executive Officer for his/her review and approval or disapproval within six (6) months of the Regional Board's approval of the recommended Best Management Practices for development projects ("BMPs"). These BMPs were approved by the Regional Board on April 22, 1999, with the adoption of Resolution No. 99-03. In July of 1999 and thereafter through a modification in August of 1999, the Permittees timely submitted their SUSMP Program. 7/30/99 deadline

By its own terms, the Permittees' SUSMP applies to certain development categories identified in the Permit, and requires applicants of designated development projects to submit an Urban Stormwater Mitigation Plan that implements appropriate requirements and measures to minimize impacts from storm water runoff, and to reduce storm water pollutants to the maximum extent practicable. A copy of the Permittees' SUSMP, as submitted in July of 1999 and as thereafter revised in August of 1999, is attached to the Petition and marked as Exhibit "A."

The Permittees' SUSMP incorporates the appropriate elements of the recommended list of BMPs approved by the Regional Board through Resolution No. 99-03 on April 22, 1999. To date, since the submittal of the Permittees SUSMP, the Executive Officer has failed to either approve or

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disapprove the Permittees' SUSMP, and has thus failed to act in accordance with the Administrative Review process set forth under the Permit.

Rather than permitting the Executive Officer to exercise his discretion and act upon the Permittees' SUSMP, as required under the Permit, on January 26, 2000, the Regional Board directed the Executive Officer to approve a SUSMP prepared by its staff (hereinafter "Regional Board SUSMP"). Under the requirements of the Permit, however, the Regional Board SUSMP could not legally have been forced on the Permittees. To the contrary, the Permit requires that the SUSMP Program submitted by the Permittees be reviewed and acted upon and that an administrative process be followed to resolve "any differences in compliance expectations" with the Permittees' SUSMP Program.

The Regional Board SUSMP consists of a December 7, 1999 Program prepared by Regional Board Staff and thereafter modified by staff through a change sheet dated January 25, 2000. It was then further substantially modified by the Regional Board itself on January 26, 2000, ***after the close of the public testimony***. Copies of the December 2, 1999, Regional Board Program and the January 25, 2000, Change Sheet are attached to the Petition and collectively marked as Exhibit "B." The Regional Board and the Executive Officer's actions in approving the Regional Board mandated SUSMP directly contradict the express terms of the Permit itself and were taken without providing Petitioners with sufficient notice of the proposed provisions and a fair hearing.

The Regional Board SUSMP far exceeds the obligations and requirements of the Permittees under the Permittees' SUSMP, and was thus adopted by the Regional Board in excess of its authority under the Permit, the Clean Water Act, and the Porter-Cologne Act. In particular, the Regional Board's SUSMP imposes, among other requirements, the following terms not agreed to or concurred with by the Permittees: (1) a requirement that the Permittees impose a design standard/numerical mitigation measure to require the treatment of .75 inches of rainfall over a 24 hour period in nine (9) priority project categories of development (hereafter the "Numerical Mitigation Standard"); (2) a requirement that the Permittees expand their SUSMP to apply to all "non-discretionary" as well as "discretionary" projects within the nine subject project categories, in violation of the terms of the Permit; (3) a requirement that the SUSMP extend to two additional

project categories, in addition to the seven categories set forth in the terms of the Permit; and (4) a requirement that the SUSMP apply to all "redevelopment" within the nine priority project categories, again in conflict with the Permittees' SUSMP.

In addition, the Regional Board SUSMP was adopted without evidence or findings showing that it would improve water quality, that it is cost effective, or even that it will "reduce the discharge of pollutants to the maximum extent practicable," as required under the Clean Water Act. The Regional Board SUSMP was adopted and imposed on the Permittees without sufficient testing, analysis, or other evidence as to its effectiveness and without any balancing of the benefits of the Program versus its excessive cost. Respondents in this Petition have acted arbitrarily and capriciously and have not acted in accordance with law.

In short, the SUSMP mandated by the Regional Board on January 26, 2000, has not been submitted by or agreed to by the Permittees, has not been adopted in accordance with the terms of the Permit, the Clean Water Act or the Porter-Cologne Act, has not been shown to be cost-effective or beneficial to the waters of the State of California or the United States, and has not been shown to control pollutants to the "maximum extent practicable" as required by state and federal law.

III. RESPONDENTS' ACTIONS WERE IMPROPER AND INAPPROPRIATE BECAUSE RESPONDENTS FAILED TO COMPLY WITH THE ADMINISTRATIVE REVIEW PROCESS REQUIRED UNDER ORDER NO. 96-054

The Administrative Review Process set forth under the Permit (Order No. 96-054, § 2.I.G) requires that the Regional Board and its Executive Officer follow an Administrative Process "for review and acceptance of reports and documents submitted to the Regional Board," and provides for a method "to resolve ***any differences*** in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action." (Id.) The Regional Board, at its January 26, 2000 hearing, admitted that the Administrative Review Process applied, and further admitted it had failed to comply with the letter of the law required by this process. Respondents' failure to

comply with these terms of the subject Permit and to properly process the Permittees' SUSMP pursuant to the Permittees' Administrative Review Process constitutes a violation of the Permit and federal and state law.

Under the Administrative Review Process, the Executive Officer is required to notify the Permittees of his approval or disapproval of the Permittees' SUSMP within 120 days of its submittal. To date, Respondents have failed to comply with such requirement and have failed to comply with various other requirements set forth in the Permit in reviewing and processing the Permittees' SUSMP. (See Order No. 96-054, Part 2.I.G.) Respondents have further failed to resolve any differences in compliance expectation with the Permittees' SUSMP, which is required by the Permit before the Permittees can be found to be in violation of the Permit. Accordingly, under the terms of the Permit, the Executive Officer is prohibited from taking ***"enforcement action again a Permittee until the Executive Officer has notified the Permittee in writing that the Administrative Review Process has been exhausted and that the Executive Officer has determined that a violation exists warranting enforcement."*** (Order No. 96-054, Part 2.I.G.2.d.)

In failing to act on the Permittees' SUSMP in accordance with the Permit, and through the Regional Board and the Executive Officer's actions to force the Regional Board SUSMP on the Permittees, Respondents acted inappropriately and improperly. (23 CCR, § 2052 (A)(B).) The State Board must therefore find that Respondents acted arbitrarily and capriciously in violation of law, and should order said Respondents to comply with the terms of the Permit and review and process the Permittees' SUSMP accordingly. (Id.)

IV. RESPONDENTS HAVE NO AUTHORITY UNDER THE PERMIT, THE CLEAN WATER ACT, OR THE PORTER-COLOGNE ACT TO MANDATE THEIR OWN SUSMP ON THE PERMITTEES.

In July of 1996, when the Regional Board issued Order No. 96-054, the Board exercised its discretion and set forth the requirements by which the Permittees were to comply with the requirements of the Clean Water Act to reduce the discharge of pollutants "to the maximum extent practicable." (See, 33 U.S.C. § 1342(p)(3)(b).) To date, Respondents have produced no evidence

make any findings or show any relationship between the reasonableness of these costs and the need for the program instead of the Permittees' SUSMP Program. Respondents' failure to analyze the costs of its mandated SUSUMP violates the California Water Code and Order No. 96-054, and precludes implementation of cost effective storm water pollution control measures under the Order.

VI. THE REGIONAL BOARD'S SUSMP HAS NOT BEEN SHOWN TO REDUCE POLLUTANTS TO THE MAXIMUM EXTENT PRACTICABLE

The Clean Water Act requires the subject Permittees to impose controls to reduce pollutants "to the maximum extent practicable." At the time of the hearing on January 26, 2000, and prior thereto, the Regional Board failed to present sufficient evidence to show its SUSMP will result in the reduction of pollutants "to the maximum extent practicable" as required under state and federal law. Accordingly, because Respondents have failed to show that their mandated SUSMP program controls pollutants "to the maximum extent practicable," under the express terms of the Clean Water Act, U.S.C. Title 33, Section 1342(p)(3)(B), there is no requirement that Petitioners implement such program.

VII. RESPONDENTS' ACTIONS VIOLATE CALIFORNIA WATER CODE SECTION 13360.

California Water Code Section 13360 prohibits the Regional Board, as well as the State Board, from specifying specific design, location or types of construction or other particular types of compliance requirements in any order or set of waste discharge requirements. The Regional Board's attempt to mandate its SUSMP, in furtherance of an "order" issued under the Clean Water Act and Waste Discharge Requirements, is a direct violation of Section 13360, because it is an attempt to impose on the Permittees "specific design, location or types of construction or other types of compliance requirements." (See Cal. Water Code § 13360.) Accordingly, the action taken by the Respondents in attempting to mandate the Regional Board's SUSMP violates California Water Code Section 13360.

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VIII. RESPONDENTS' ACTIONS WILL RESULT IN THE IMPOSITION OF UNFUNDED MANDATES IN VIOLATION OF THE CALIFORNIA CONSTITUTION.

Under Article XIII B, Section 6 of the California Constitution, a state agency is prohibited from shifting the financial burden of carrying out governmental functions to local entities, unless it includes a provision specifically reimbursing local governments for the costs of such functions. In the instant case, the Regional Board has imposed its SUSMP program without providing any funding mechanism to the Permittees to implement the mandated program.

Regional Board staff has contended that the imposition of the Regional Board SUSMP is not an unfunded mandate because it involves a Federal Permit. Not true. As explained in Hayes v. Commission on State Mandates (1992) 11 Cal.App.4th 1564, the prohibition on unfunded mandates applies even where federal law is involved, unless the state has "***no true choice***" in the manner of implementing the federal program. (Id. at 1593 emphasis added.)

Moreover, Respondents have contended that they have the "discretion" to impose their SUSMP program on the Permittees rather than the Permittees' SUSMP. In fact, Respondents have specifically relied upon the Ninth Circuit decision in Defenders of Wildlife v. Browner (1999) 191 F.3d 1159 to argue that they have the "discretion" to mandate the Numerical Mitigation Standard and other requirements on the Permittees.[4]

Respondents' reliance on Defenders of Wildlife v. Browner is self-defeating. As set forth above, the existing Permit and federal and state law do not provide Respondents with any authority to exercise "discretion" to impose a SUSMP not contemplated by the Permit. Even if such discretion existed in this circumstance, however, the exercise of such discretion would require the provision of funds to carry out the purportedly "discretionary" mandated SUSMP. Respondents cannot have it both ways. Either Respondents have the "discretion" under the Permit to mandate their SUSMP program on the Permittees, or they do not. If they have the "discretion" to do so, they then are exercising such "discretion" to mandate a non-federally mandated program.

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[4] Respondents' reliance on Defenders of Wildlife v. Browner is misplaced. As earlier noted, the Los Angeles Region has operated under the current NPDES Permit since 1996. The instant case does not address the issuance of a permit as was the case in Defenders of Wildlife.

If such discretion exists and was the basis for the mandated SUSMP, the mandate ***must*** be funded in compliance with Article XIII B, Section 6 of the California Constitution. (Hayes, supra, 11 Cal.App.4th at 1564.) Conversely, if they do not have the "discretion" to mandate such a program on the Permittees (as such is prohibited by the terms of the Permit itself), then the Respondents' actions are void *ab initio*.

IX. RESPONDENTS' ACTIONS CONSTITUTED THE ADOPTION OF REGULATIONS IN VIOLATION OF THE CALIFORNIA ADMINISTRATIVE PROCEDURES ACT.

The California Administrative Procedures Act, Government Code sections 11340, *et seq.* ("APA") was enacted to establish basic minimum procedural requirements for the adoption, amendment, or repeal of administrative regulations promulgated by the State's many administrative agencies. (See Grier v. Kizer (1990) 219 Cal.App.3d 422, 431; see also, Gov. Code § 11346.) Although California law does not require administrative agencies to comply with the APA when simply issuing or amending permits, including the issuance of waste discharge requirements, where the permit or amendment in question rises to the level of an order, regulation, or ***standard of general application***, the APA applies. (Gov. Code § 11342(g).)

The action taken on January 26, 2000 by the Regional Board – directing its Executive Officer to adopt the Regional Board SUSMP and requiring the Permittees' compliance therewith – constitutes an order and standard of general application because it was imposed on ***all*** Permittees, i.e., some 85 plus cities in the County, and the County itself. The Regional Board's SUSMP will require the implementation of a Numerical Mitigation Standard and other requirements on ***all*** "discretionary" and "non-discretionary" projects within the nine (9) development categories throughout the entire County of Los Angeles. As a result, the actions taken by the Respondents have risen to the level of an order and a regulation and a standard of general application, requiring compliance with the APA.

In State Water Resources Control Board v. Office of Admin. Law (1993) 12 Cal.App.4th 697, the Court analyzed various amendments to a water quality control plan and found that such

amendments constituted a "regulation" which was required to be adopted in compliance with the APA. The court held that where an administrative agency's directive "looks like a regulation, reads like a regulation, and acts like a regulation, it will be treated as a regulation whether or not the agency in question so labeled it." (Id. at 702.) The court further found that in light of this strong legislative mandate, the regulatory agency directives at issue, such as amendments to the Water Quality Control Plan, were regulations.

Here, the Regional Board's mandated SUSMP program was imposed under Order No. 96-054, which does not allow for the compulsion of such a program or the compulsion of any program. Far removed from the Order's provisions and having general application to some 86 public entities and innumerable development projects, the mandated SUSMP program constitutes a "regulation" for purposes of the APA. Because the requirements of the APA have not been complied with, the action taken by the Respondents has no legal force or effect. (Id. at 702.)

X. RESPONDENTS HAVE FAILED TO COMPLY WITH THE REQUIREMENTS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT.

CEQA required the Respondents to review potential significant environmental impacts before taking their action of January 26, 2000. Specifically, CEQA requires the consideration of all potential significant environmental impacts resulting from the project imposed on the Permittees by the Respondents. (See Cal. Pub. Res. Code § 21000 et seq; Azuza Land Reclamation Co. v. Main San Gabriel Basin Watermaster 52 Cal.App.4th 1165, 1188-1191 [holding that Regional Water Board's adoption of order that approved the continued dumping of municipal solid waste constituted a "project" under CEQA].) In this case, there are a number of potentially significant environmental impacts Respondents should have considered under CEQA, but failed to do so. For example, Respondents failed to consider the impacts of their actions on ground water quality, vector control, the generation of solid and/or hazardous waste, the creation of nuisances throughout the County, the impact on the development of infiltration basins/ponds on low and moderate income housing and other development throughout the County, as well as other potentially significant environmental impacts.

Regional Board staff has incorrectly contended that California Water Code Section 13389 exempts Respondents actions from the requirements of CEQA. However, Section 13389 clearly only exempts the State and Regional Boards from the requirements of CEQA "prior to the adoption of any waste discharge requirement." (See Cal. Water Code § 13389.) In the instant case, Respondents' actions were neither agendized nor publicly noticed as proposed actions to amend or adopt new "waste discharge requirements." In addition, and as discussed above and in the Petition itself, federal law and state law governing waste discharge requirements provide no authorization for Respondents' actions. Moreover, the action taken by the Board and the follow-up action taken by its Executive Officer will have significant adverse environmental impacts on the general public. Respondents' actions were not exempt from CEQA. (See, e.g., Azuza Land Reclamation Co., supra, 52 Cal.App.4th 1165, 1216-1218.)

Accordingly, Petitioners respectfully request that the action taken by the Regional Board and its Executive Officer in imposing the Regional Board's SUSMP be overturned, as Respondents have failed to comply with the requirements of CEQA.

XI. RESPONDENTS HAVE FAILED TO PROVIDE PROPER NOTICE OF THEIR PROPOSED ACTIONS AND HAVE FAILED TO PROVIDE PETITIONERS SUFFICIENT OPPORTUNITY TO BE HEARD, THEREBY DEPRIVING THEM OF DUE PROCESS OF THE LAW.

As referenced above and in the Petition, the action taken by the Respondents is not and was not authorized anywhere under the Permit, the Clean Water Act or the Porter-Cologne Act. Nonetheless, Respondents conducted a "public hearing" prior to taking action, presumably to evidence the following of some administrative procedure. Respondents, however, failed to provide Petitioners sufficient notice prior to the public hearing of their proposed actions and failed to provide Petitioners sufficient opportunity to be heard prior to taking such actions.

Specifically, on the ***day of the hearing***, Regional Board staff presented a "change sheet" dated January 25, 2000, which contained a number of substantive and non-substantive changes to the proposed Regional Board SUSMP. Petitioners, and each of them, therefore were not given

full opportunity to fully review, investigate and consider the ramifications of the proposed changes because the change sheet was not provided to the Petitioners until the January 26, 2000 hearing.

In addition, after the close of public testimony at the January 26, 2000 hearing, the Regional Board made a series of substantive changes to the proposed Regional Board SUSMP, including but not limited to requiring its application to "non-discretionary" as well as "discretionary" projects, and requiring the Permittees to adopt local ordinances within six (6) months of the date of the Executive Officer's signature of the Order, with implementation 30 days thereafter. The Regional Board also decided to delete the "roof top" exemption from the previously proposed SUSMP. All of these actions of the Regional Board were taken after the close of public testimony, without proper notice to the Petitioners, and without providing Petitioners a sufficient opportunity to be heard, thereby depriving Petitioners of a fair hearing.

Respondents' substantial revisions from the previously proposed SUSMP without providing Petitioners with the any notice or opportunity to be heard denied Petitioners a fair hearing. (See, e.g., Bank of America v. Long Beach (1975) 50 Cal.App.3d 882, 886-888 ["Clearly, evidence to be used against a party must be disclosed in such fashion that there is an opportunity to rebut it." [Citations]]. "A hearing requires that the party be apprised of the evidence against him so that he may have an opportunity to refute, test, and explain it, and the requirement of a hearing necessarily contemplates a decision in light of the evidence there introduced. [Citations]." (English v. Long Beach (1950) 35 Cal.2d 155, 158-159.) The Regional Board's actions denied Petitioners any reasonable opportunity to fully present their position on the significant revisions of the mandated SUSMP, thereby depriving Petitioners of due process of law.

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XII. CONCLUSION

For the foregoing reasons, as well as those set forth in the Petition, Petitioners herein and each of them, respectfully request that the action taken by the Los Angeles Regional Water Quality Control Board on January 26, 2000, and all subsequent actions based thereon by its Executive Officer, be overturned, and that the Executive Officer be directed to review and approve the Permittees' SUSMP in accordance with the terms of Order No. 96.054, as well as the Clean Water Act and state law.

Dated: February 27, 2000

Respectfully submitted

RUTAN & TUCKER LLP
RICHARD MONTEVIDEO
TERENCE J. GALLAGHER

By: _____
RICHARD MONTEVIDEO
Attorneys for Petitioners

PROOF OF SERVICE BY OVERNIGHT DELIVERY

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over the age of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fourteenth Floor, Costa Mesa, California 92626-1950.

On February 24, 2000, I served on interested parties in said action the within:

PETITIONERS' STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT OF LEGAL ISSUES IN PETITION OF ACTIONS AND INACTIONS OF THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, AND ITS EXECUTIVE OFFICER, DENNIS DICKERSON, PURSUANT TO ORDER NO. 96-054 (NPDES NO. CAS614001)

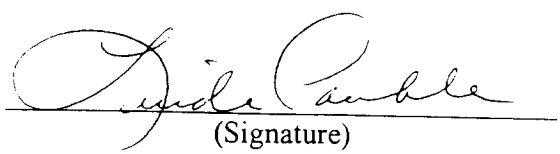
I deposited in a box or other facility regularly maintained by Overnight Express, an express service carrier, or delivered to a courier or driver authorized by said express service carrier to receive documents, a true copy of the foregoing document in sealed envelopes or packages designated by the express service carrier, addressed as stated below, with fees for overnight delivery paid or provided for.

Dennis A. Dickerson
Executive Officer
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Executed on February 24, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Linda Cauble
(Type or print name)


(Signature)

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LOS ANGELES REGION

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF ARTESIA, BELLFLOWER, BURBANK, CERRITOS, COMMERCE, DIAMOND BAR, DOWNEY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, PALOS VERDES ESTATES, PICO RIVERA, POMONA, RANCHO PALOS VERDES, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, Petitioners, vs. THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board, Respondents.	Case No. DECLARATION OF EDUARD SCHRODER IN SUPPORT OF REQUEST FOR STAY AND PETITION FOR REVIEW OF ACTION OF THE LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD ON JANUARY 26, 2000, AND OF ITS EXECUTIVE OFFICER, AND OF RESPONDENTS FAILURES TO ACT PURSUANT TO ORDER NO. 96-054 (NPDES NO. CAS614001)

DECLARATION OF EDUARD SCHRODER

I, Eduard Schroder, declare as follows:

1. I am a member of the Executive Advisory Committee for the Storm Water Program for Los Angeles County, an ad hoc committee consisting of certain Permittees under the California Regional Water Quality Control Board, Los Angeles Region Order No. 96-054 (NPDES No. CAS 614001), Waste Discharge Requirements For Municipal Storm Water and Urban Runoff Discharges from the County of Los Angeles (hereafter "Permit" or "Order No. 96-054"). I am also the Public Works Director for the City of Signal Hill ("City") and have acted in this capacity since June of 1999. Prior to my employment with the City of Signal Hill, I was employed with the City of El Segundo from January of 1994 to June of 1999 as its Public Works Director.

2. As a part of my responsibilities as a member of the Executive Advisory Committee and as the Public Works Director for the City, I was involved either personally or through the efforts of a consultant retained by the City, in the preparation and submittal of the Standard Urban Storm Water Mitigation Plan ("SUSMP") submitted on behalf of the Permittees for Los Angeles County in July of 1999. I was, moreover, involved in discussions which proceeded and followed the submission of the Permittees' SUSMP with other representatives of Permittees within the County, and with representatives of the Regional Water Quality Control Board. I was also involved in the preparation and submission of changes to the Permittees' July 1999 SUSMP Program, changes which were submitted in August of 1999 to the Los Angeles Regional Water Quality Control Board ("Regional Board"). The Permittees' SUSMP Program, as submitted in July of 1999 and modified in August, is hereafter referred to as the "Permittees' SUSMP."

3. I attended a public workshop conducted on September 16, 1999 by the Regional Board, where at that time Regional Board staff recommended to its Board that it consider unilateral staff imposed mandated changes on the Permittees' SUSMP Program. At this September 16th workshop, the Regional Board took no action on either the Permittees' SUSMP or the Regional Board staff's proposed SUSMP, but instead determined to continue the matter for approximately 90 days with a new hearing to be renoticed.

4. On January 26, 2000, I attended a public hearing conducted by the Regional Board

on a proposed SUSMP program that included a number of provisions that were not agreed to by the Permittees nor included in the Permittees' SUSMP Program as modified and submitted in August of 1999. In fact, at the time of the January 26, 2000 public hearing, and even to this date, neither the Regional Board nor its Executive Officer have reviewed and approved or disapproved the Permittees' SUSMP Program, in accordance with the Administrative Review Process set forth under Order No. 96-054. Rather, the focus of the Regional Board on January 26, 2000, was on a Regional Board SUSMP Program dated December 7, 1999 as modified by a change sheet dated January 25, 2000 by the Regional Board staff. Because the January 25, 2000 change sheet was not distributed until the day of the hearing, I and representatives of other Petitioners did not have sufficient time to properly review and analyze the changes proposed in the change sheet, and were moreover not in a position to provide adequate testimony on these changes.

5. At the close of the January 26, 2000 public comment period, I am informed that the Regional Board proceeded to make yet additional modifications to the staff's proposed SUSMP Program, and to direct its Executive Officer to adopt the Regional Board SUSMP Program as modified by staff through its change sheet dated January 25, 2000, and as further modified by the Board on January 26. The SUSMP Program mandated by the Board on January 26, 2000 is hereafter referred to as the "Regional Board SUSMP." Because of the additional changes made by the Regional Board itself after the close of the public comment period at the hearing on January 26, again I and other Petitioners were not in a position to analyze all of the proposed changes made to the Regional Board SUSMP Program at the hearing, nor were we able to proceed and present evidence to the Regional Board to address concerns we have with the changes.

6. Although an Order has not yet been adopted by the Executive Officer, I am informed that the Regional Board SUSMP imposed the following mandated programs and terms, among others, that have not been agreed to or provided for in the Permittees' SUSMP: (1) a design standard/numerical mitigation measure on the retention and/or treatment of storm water run off of .75 inches within a 24 hour storm event for nine (9) project categories set forth in the Regional Board SUSMP; (2) the application of the SUSMP to all "non-discretionary" as well as "discretionary" projects falling within the nine subject project categories in the County of Los

Angeles, in violation of the terms of Order No. 96-054; (3) the addition of two additional priority project categories beyond those set forth in Order No. 96-054, i.e., development in "environmentally sensitive areas" and the development of parking lots with 25 or more spaces; and (4) the application of the Regional Board SUSMP to "redevelopment" as opposed to "development" as provided for under Order No. 96-054.

7. The action taken by the Regional Board on January 26, 2000, and the failure of the Executive Officer to act on the Permittees' SUSMP, has resulted in the Regional Board taking action inconsistent with the Administrative Review Process under the Permit by failing to allow their Executive Officer to act on the Permittees' SUSMP, and by mandating the Regional Board SUSMP on the Permittees.

8. I have read Order No. 96-054 and am very familiar with its terms and the programs submitted by the Permittees under the Permit. The terms of the Permit do not give the Regional Board the discretion to impose new Permit requirements on the Permittees in mid-stream without a proper hearing on an amendment to the Permit. In addition, the programs set forth in the Regional Board SUSMP will result in the imposition of mandated requirements and programs on Permittees throughout the County of Los Angeles, at significant cost and expense to such Permittees, without any funding from the Regional Board or the State Board to carry out the requirements of these mandates.

9. Additional concerns with the actions taken by the Regional Board and its Executive Officer involve the lack of information and scientific evidence and studies on the Regional Board SUSMP Program, the benefits to be obtained from such SUSMP Program, the costs effectiveness of the Regional Board SUSMP, and the lack of information and direction on the implementability of the Regional Board SUSMP. The Regional Board did not provide sufficient evidence at the hearing on January 26, or otherwise, to adequately address these issues, or the requirement that the SUSMP Program reduce the discharge of pollutants to the maximum extent practicable.

10. As referenced above, a number of changes were submitted to the Regional Board through a change sheet dated January 25, 2000, a change sheet that was not presented to the Permittees until January 26, 2000 at the time of the hearing. Some of the changes in the change

sheet concern substantial changes to the Program submitted by the Regional Board in December of 1999. Further, after the close of public testimony, I am informed that the Regional Board itself proceeded to make a number of substantial and significant changes to the Regional Board's SUSMP, without prior notice of the proposed changes and without giving the public, including the Petitioners, an opportunity to provide evidence and input on such proposed changes. These changes include, among other changes, expanding the application of this SUSMP Program to "non-discretionary" as well as "discretionary" projects within the City, providing the City with only six months in which to adopt an ordinance to implement the Regional Board's SUSMP on both discretionary and non-discretionary projects, with only an additional 30 days to implement the Program; and deleting the so-called "roof top" exemption from the terms of the Program. With these changes and others, but without sufficient notice of the same, the Regional Board and its Executive Officer failed to give the Petitioners sufficient opportunity to be heard and to present evidence on these various issues and others raised by these last minute changes.

11. The impact that will result from the actions and inactions taken by the Regional Board and its Executive Officer concern not only the Permittees, but also the building industry, the restaurant industry, and the public at large. The impacts are, moreover, substantial and far reaching. First, the water quality benefits to be obtained from the imposition of the Regional Board's mandated SUSMP Program are undefined, untested, and unknown. Second, although the actual cost to implement the Regional Board SUSMP are unknown at this time (as they have not been fully investigated by the Regional Board), the costs are known to be significant both in terms of additional development costs, design costs, land costs, implementation costs, maintenance costs and environmental costs. Third, substantial harm will result not only to the development community, the building industry and the restaurant industry in the form of lost land and high development costs, these costs will be passed on to the general public, making it more difficult to provide low and moderate income housing, and other affordable development. Fourth, the potential liability, bodily injury and property damage created by the design standards imposed by the Regional Board's action are unknown, but are believed to be substantial. Fifth, the Regional Board has failed to address the implementation problems created by its actions, and has failed to

consider the problems created by expanding the application of SUSMPs to "non-discretionary" projects, in violation of the terms of the Permit. Sixth, the Regional Board has failed to analyze the potential impacts on groundwater quality created by allowing the introduction and infiltration of pollutants of concern through the soil and into the region's groundwater. Finally, the Regional Board has failed to consider the vector and pest control problems created by its actions, and the nuisances that will result from the Regional Board SUSMP.

12. Accordingly, unless the action taken by the Regional Board and its Executive Officer is stayed, substantial harm will result to both the Petitioners under the Petition, as well as citizens throughout the County of Los Angeles and the general public. Moreover, if a stay is granted to allow the State Board to adequately review the action taken by the Regional Board and its Executive Officer, and to determine whether such action was appropriate or at least whether such action raises substantial questions of law or fact, I am aware of no evidence indicating any substantial harm to any person or member of the public. Clearly, the harm to be incurred by the Petitioners and the members of the public, as well as the building and restaurant industry, far outweigh any alleged harm to any person or the public should a stay not be granted.

13. With this Petition, Petitioners believe there are substantial questions of fact which must be addressed that have not been addressed by this Regional Board, many of which we did not have a full opportunity to raise with the Board because of the last minute nature of the changes. In addition, I am advised by counsel for the Petitioners that there are substantial questions of law raised by the Regional Board's and the Executive Officer's actions of January 26, 2000 and thereafter.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct of my own personal knowledge, if called upon as a witness I could and would competently testify thereto under oath.

This Declaration was executed this 24th day of February, 2000 in the City of Signal Hill, County of Los Angeles, State of California.

Eduard Schroder

EDUARD SCHRODER

PROOF OF SERVICE BY OVERNIGHT DELIVERY

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over the age of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fourteenth Floor, Costa Mesa, California 92626-1950.

On February 24, 2000, I served on interested parties in said action the within:

DECLARATION OF EDUARD SCHRODER IN SUPPORT OF REQUEST FOR STAY AND PETITION FOR REVIEW OF ACTION OF THE LOS ANGELES REGIONAL WATER QUALITY CONTROL BOARD ON JANUARY 26, 2000, AND OF ITS EXECUTIVE OFFICER, AND OF RESPONDENTS' FAILURES TO ACT PURSUANT TO ORDER NO. 96-054 (NPDES NO. CAS614001)

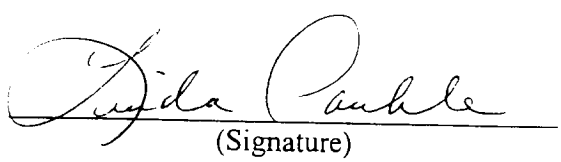
I deposited in a box or other facility regularly maintained by Overnight Express, an express service carrier, or delivered to a courier or driver authorized by said express service carrier to receive documents, a true copy of the foregoing document in sealed envelopes or packages designated by the express service carrier, addressed as stated below, with fees for overnight delivery paid or provided for.

Dennis A. Dickerson
Executive Officer
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Executed on February 24, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Linda Cauble
(Type or print name)


(Signature)

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RUTAN
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ROBERT E. KING DEJA M. HEMINGWAY JULIE K. WHANG DENISE L. MESTER W. ANDREW MOORE ALISON L. TSAO CHARLES A. DAVENPORT, III DANIEL L. GEBERT JULIE L. DREW NATASHA L. PAVIA RICHARD D. ARAO MARK M. MALOVOS NIKKI NGUYEN

OF COUNSEL EDWARD D. SYBESMA, JR.* DAVID I. GARIBALDI, III

*A PROFESSIONAL CORPORATION

February 24, 2000

VIA FEDEX

State Water Resources Control Board
Office of Chief Counsel
901 "P" Street
Sacramento, CA 95814

RECEIVED
00 FEB 25 AM 9:
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

Attn: Craig M. Wilson, Esq.

Re: The Cities of Arcadia, et al. v. The California Regional Water Quality Control Board, Los Angeles Region, et al.

Dear Mr. Wilson:

Enclosed with this letter is a Petition to the State Water Resources Control Board on behalf of a number of Petitioners in the County of Los Angeles challenging actions and inactions of the California Regional and Water Quality Control Board, Los Angeles Region, and its Executive Officer, in connection with the NPDES Permit for Municipal Storm Water and Urban Run-Off Discharges within the County of Los Angeles, Order No. 96-054 (NPDES No. CAS 614001). The Petition itself includes the points and authorities supporting the legal issues raised in the Petition. In addition, enclosed is a separate set of points and authorities supporting the legal issues raised in the Petition which, when combined with the points and authorities in the Petition itself, collectively constitute the Petitioners' statement of points and authorities for purposes of this proceeding.

Please note that the Petitioners are also seeking a hearing for purposes of presenting additional evidence that could not have been presented at the time of the hearing on January 26, 2000, because of the late notice and improper notice provided to the Petitioners on substantial modifications made to the Regional Board's proposed Standard Urban Storm Water Mitigation Plan ("SUSMP") and changes made after the close of the public testimony.

Also attached to and enclosed with the Petition is a request to the Regional Board to prepare the transcripts and tape recordings of the proceeding on January 26, 2000, as well as a request that the Regional Board prepare a list of persons known by the Regional Board to have

an interest in the subject matter of this Petition, and to forward such list to the State Board and the Petitioners.

Finally, enclosed please find an affidavit supporting Petitioners' request for a stay given the significant harm that will result to Petitioners if a stay is not granted, and the lack of harm to other interested persons if a stay is granted. We look forward to an expeditious resolution of the issues raised in the Petition.

Thank you for your consideration of the above and the enclosed. If you have any questions or need any additional information in this regard, please do not hesitate to contact the undersigned.

Sincerely,

RUTAN & TUCKER, LLP

Richard Montevideo

RM:lc
Enclosures
cc: Mr. Dennis A. Dickerson, Executive Officer, LARWQCB (via Overnight Express)

RUTAN & TUCKER LLP
RICHARD MONTEVIDEO (BAR NO. 116051)
TERENCE J. GALLAGHER (BAR NO. 192341)
611 Anton Boulevard, Fourteenth Floor
Costa Mesa, California 92626-1950
Telephone: 714-641-5100
Facsimile: 714-546-9035

Attorneys for Petitioners

RECEIVED
00 FEB 25 AM 9:3
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF ARTESIA, BELLFLOWER, BURBANK, CERRITOS, COMMERCE, DIAMOND BAR, DOWNEY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, PALOS VERDES ESTATES, PICO RIVERA, POMONA, RANCHO PALOS VERDES, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, Petitioners, vs. THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board, Respondents.	Case No. PETITION FOR REVIEW OF JANUARY 26, 2000 ACTION OF THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, AND ACTIONS AND FAILURES TO ACT BY IT AND ITS EXECUTIVE OFFICER, DENNIS DICKERSON, PURSUANT TO ORDER NO. 96-054 (NPDES NO. CAS614001) [Request for Immediate Stay - Water Code Section 13321 and 14 CCR Section 2053] [Request for Hearing - 14 CCR Section 2050(b)]

Petitioners, the Cities of Artesia, Bellflower, Burbank, Cerritos, Commerce, Diamond Bar, Downey, Irwindale, La Canada-Flintridge, La Mirada, La Verne, Lakewood, Lawndale, Monrovia,

Palos Verdes Estates, Pico Rivera, Pomona, Rancho Palos Verdes, Santa Fe Springs, Signal Hill, South Gate, Vernon, Walnut, and Whittier (hereafter collectively the "City Petitioners"), and the Building Industry Association of Southern California and the Building Industry Legal Defense Foundation, hereafter collectively "Petitioners," hereby petition the State Water Resources Control Board ("State Board"), pursuant to California Water Code Section 13320 and applicable California law, as follows:

I. GENERAL ALLEGATIONS

1. City Petitioners herein, are and at all relevant times herein, were cities organized under and existing under the laws of the State of California and located in the County of Los Angeles, California. The respective address for each City Petitioner is as follows:

(a) Artesia – 18747 Clarkdale Avenue, Artesia, CA 90701

(b) Bellflower – 166600 Civic Center Drive, Bellflower, CA 90706

(c) Burbank – 275 E. Olive Avenue, Burbank, CA 91502

(d) Cerritos - 18125 Bloomfield Avenue, Cerritos, CA 90703-3130

(e) Commerce – 2535 Commerce Way, Commerce, CA 90040

(f) Diamond Bar – 21660 E. Copley Drive, Diamond Bar, CA 91765

(g) Downey – 11111 Brookshire Avenue, Downey, CA 90241

(h) Irwindale - 5050 N. Irwindale Avenue, Irwindale, CA 91706

(i) La Canada Flintridge – 1327 Foothill Boulevard, La Canada Flintridge, CA 91011

(j) La Mirada – 13700 La Mirada Boulevard, La Mirada, CA 90638

(k) La Verne – 3660 "D" Street, La Verna, CA 91750-3599

(l) Lakewood – 5050 N. Clark Avenue, Lakewood, CA 90712

(m) Lawndale – 14717 Burin Avenue, Lawndale, CA 90260

(n) Monrovia – 415 S. Ivy Avenue, Monrovia, CA 91016

(o) Palos Verdes Estates –340 Palos Verdes Drive W., Palos Verdes Estates, CA 90274

(p) Pico Rivera – 6615 Passons Boulevard, Pico Rivera, CA 90660

(q) Pico Rivera – 6615 Passons Boulevard, Pico Rivera, CA 90660

(r) Pomona – 505 S. Gary Avenue, Pomona, CA 91769

(s) Rancho Palos Verdes – 30940 Hawthorne Boulevard, Rancho Palos Verdes, CA 90275

(t) Santa Fe Springs – 11710 Telegraph Road, Santa Fe Springs, CA 90670

(u) Signal Hill - 2175 Cherry Avenue, Signal Hill, CA 90806

(v) South Gate – 8650 California Avenue, South Gate, CA 90280

(w) Vernon - 4305 Santa Fe Avenue, Vernon, CA 90058

(x) Walnut – 2120 La Puente Road, Walnut, CA 91789

(y) Whittier –13230 Penn Street, Whittier, CA 90602

2. City Petitioners, and each of them, are Permittees under that Permit issued by the California Regional Water Quality Control Board, Los Angeles Region, on July 15, 1996, Waste Discharge Requirements for Municipal Storm Water and Urban Run-Off Discharges within the County of Los Angeles, Order No. 96-054 (NPDES NO. CAS 614001).

3. Petitioners the Building Industry Legal Defense Foundation ("BILD") and the Building Industry Association of Southern California ("BIA/SC") are Non-Profit Mutual Benefit Corporations whose addresses are:

(a) Building Industry Association of Southern California – 1330 S. Valley Vista Drive, Diamond Bar, CA 91765

(b) Building Industry Legal Defense Foundation – 1330 S. Valley Vista Drive, Diamond Bar, CA 91765

4. BILD and BIA/SC are California non-profit corporations dedicated to representing the interests of members of the Southern California construction and building industry. BILD is a wholly owned subsidiary of BIA/SC whose purposes are to monitor legal developments and participate in litigation impacting the residential construction industry in Southern California. BIA/SC's 1,800 members include a significant number of residential developers and associate businesses that construct approximately 70% of all the residential housing units built annually in the Southern California Region. BILD and BIA/SC members reside and conduct commercial land

development activities within the jurisdiction of the California Regional Water Quality Control Board, Los Angeles Region, and within the City Petitioners' jurisdictions. BIA/SC and BILD members are currently engaged in, and in the future will engage in, development projects that must comply with and implement Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Run-Off Discharges within the County of Los Angeles. BILD and BIA/SC are authorized to bring legal action, including this Petition, on behalf of BILD and BIA/SC members.

5. City Petitioners, BILD, and BIA/SC are interested aggrieved parties as said Petitioners and their members are adversely impacted by actions taken by Respondents in connection with a Regional Board mandated Standard Urban Storm Water Mitigation Plan imposed on Petitioners and other interested parties on January 26, 2000, and as said Petitioners are adversely impacted by failures to act on the part of Respondents in connection with a Standard Urban Storm Water Mitigation Plan submitted by the City Petitioners in July of 1999. Petitioners herein, as aggrieved parties, with this Petition, are challenging the actions taken by the Respondents on January 26, 2000, and the failures of the Respondents to act lawfully in reviewing and approving the Standard Urban Storm Water Mitigation Plan submitted by the City Petitioners, in accordance with state and federal law, as described below. The actions taken by the Respondents, and each of them, and their failures to act, were improper, inappropriate, arbitrary and capricious, and in violation of state and federal law.

6. Respondent, the California Regional Water Quality Control Board, Los Angeles Region ("Regional Board"), is and at all relevant times herein, was a regional agency created pursuant to the provisions of the California Water Code, Section 13200 *et seq.*

7. Respondent Dennis Dickerson is, and at all relevant times herein was, the Executive Officer of the Regional Board.

8. The State Water Resources Control Board ("State Board") is a state agency created pursuant to the California Water Code Sections 174 *et seq.* and 13200 *et seq.* and is charged with formulating and adopting state policy for water quality control within the State of California.

9. Under State law, in formulating and revising state policy for water quality control,

the State Board is required to consult with and carefully evaluate the recommendations of concerned federal, state and local agencies on water quality policy issues. (Cal. Water Code § 13144.) The State Board is designated as the state water pollution control agency for all purposes stated in the Federal Water Pollution Control Act (the "Clean Water Act" - 33 U.S.C.§ 1251 et seq.), and is the authorized agency to exercise powers delegated to it under the Clean Water Act and any amendments thereto. (Cal. Water Code § 13160.) The State Board is further empowered pursuant to state and federal law, to adopt water quality control plans as required by the Clean Water Act, and such plans, when adopted, supersede any Regional Water Quality Control plans. (Cal. Water Code § 13170.)

10. Pursuant to California Water Code Section 13320 and the regulations thereto, the State Water Resources Control Board has jurisdiction over this Petition.

II. THE REQUIREMENTS OF THE CLEAN WATER ACT AND STATE LAW

11. The Federal Water Pollution Control Act was adopted in 1948, amended in 1972, and again amended in 1977 as the Clean Water Act of 1977. In 1987, the Act was amended to establish new controls on industrial and municipal storm water discharges. The 1987 amendments, in part, required National Pollutant Discharge Elimination System ("NPDES") Permits for storm water discharges from Municipal Separate Storm Sewer Systems ("MS4s").

12. The Clean Water Act requires permits for discharges from municipal storm sewer systems to require controls "to reduce the discharge of pollutants to the maximum extent practicable." (33 U.S.C. § 1342(p)(3)(B).) Dischargers who are issued permits and who operate within the terms of such permits are thus in compliance with the requirements of the Clean Water Act.

13. The State of California is one of 38 or more states with authorization to administer certain aspects of the NPDES Program within its jurisdiction. The State Board administers the NPDES Program in California pursuant to the Clean Water Act and pursuant to that Memorandum Of Understanding between the U.S. Environmental Protection Agency ("U.S. EPA") and the California State Water Resources Control Board, effective September 22, 1989.

14. Pursuant to California Water Code Section 13160, the State Board is the designated

agency to exercise the powers delegated to the state under the Clean Water Act, including the right and obligation to administer the NPDES Program. Federal regulations allow NPDES authority within the state to be shared between two or more state agencies, if each agency has statewide jurisdiction over a class of activities or discharges. When more than one agency is responsible for issuing Permits within the state, each agency must make a submission meeting the requirements of the Federal regulations. (40 C.F.R. § 123.1(g)(1).) The Regional Board is not a state agency with statewide jurisdiction over a class of activities or discharges, and has not been authorized under the Clean Water Act or the Federal regulations to administer the NPDES Program in California, and accordingly, has no authority to do so.

15. Under existing State law, the State Board may require any state or local agency to investigate and report on any technical factors involved in water quality, provided, however, that the burden, including the costs of such reports, bears a reasonable relationship to the need for the report and the benefits to be obtained therefrom. (Cal. Water Code § 13165.)

16. Also under State law, the Regional Board, in requiring state or local agencies to investigate and report on technical factors involved in water quality control, may require such investigations from local agencies only where they can show that the burden, including the cost of such reports, bears a reasonable relationship to the need for the report and the benefits to be obtained therefrom. (Cal. Water Code § 13225(c).)

17. Respondent Regional Board is required to formulate and adopt water quality control plans for all areas within its region, and is further required to consult with and consider the recommendations of affected local agencies. (Cal. Water Code § 13240.) In establishing water quality objectives and water quality control plans within its region, the Regional Board is required to consider specific factors, including:

(a) Past, present and probable future beneficial uses of water;

(b) Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;

(c) Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;

(d) Economic considerations.

(Cal. Water Code 13241.)

18. California Water Code Section 13360, moreover, prohibits the Regional Board, as well as the State Board, from specifying in any order or set of waste discharge requirements, specific designs, locations, or types of construction standards, or a particular manner in which compliance with an order, requirement or set of waste discharge requirements, is to be met. All persons are permitted to comply with the requirements of any order or waste discharge requirements in any lawful manner. (Cal. Water Code § 13360(a).)

III. ORDER NO. 96-054 (NPDES NO. CAS614001) AND THE PERMITTEES' SUSMP

19. On or about July 15, 1996, and effective as of July 31, 1996, Petitioner Cities were issued a Permit from the Regional Board, Order No. 96-054 (NPDES No. CAS614001), Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, a Permit purportedly issued pursuant to the Clean Water Act and the Porter-Cologne Act (hereafter "Permit," "Order" or "Order No. 96-054").

20. In accordance with the terms and provisions of the Permit, the Permittees thereunder, including the City Petitioners herein, were required to submit a Standard Urban Storm Water Mitigation Plan ("SUSMP") to Respondent Dennis Dickerson, the Executive Officer of the Regional Board, for the Executive Officer's review and approval or disapproval. Under the terms of the Permit, the SUSMP was to be submitted within six months of the Regional Board's approval of the Permittees' Best Management Practices for development projects within their jurisdiction. Best Management Practices were not approved by the Regional Board until April 22, 1999, pursuant to Resolution No. 99-03. The required SUSMP program was therefore timely submitted by the Permittees to Respondent Dickerson in July of 1999. This SUSMP Program was thereafter modified in August of 1999 to address certain Regional Board comments (hereafter the July and August 1999 submittals are collectively referred to as the "Permittees' SUSMP").

21. By its terms, the Permittees' SUSMP applies to certain specified development categories identified in the Permit itself, and requires the applicants of designated development projects to submit an Urban Storm Water Mitigation Plan that implements, to the maximum extent

practicable, appropriate requirements and measures to minimize impacts from storm water runoff, and to reduce storm water pollutants to the maximum extent practicable. The Permittees' SUSMP incorporated additional conditions and requirements as required by the Permit and as necessary to reduce pollutants to the maximum extent practicable. A copy of the Permittees' SUSMP as submitted in July of 1999, and the modifications submitted in August of 1999, are attached hereto and collectively marked as Exhibit "A."

22. The Permittees' SUSMP incorporates the appropriate elements of the recommended list of Best Management Practices ("BMPs") approved by the Respondent Regional Board on April 22, 1999, by Resolution No. 99-03, and is a guideline to be used by the individual Permittees to develop their own specific programs for use in their individual jurisdictions. By its terms, the Permittees' SUSMP applies to "discretionary" projects as defined under the California Environmental Quality Act that fall within one of seven (7) project categories as outlined in the Permit, specifically: 10-99 home subdivisions; 100+ home subdivisions; single family hillside developments; 100,000 square foot commercial development; automotive repair shops; retail gas station outlets; and restaurants.

23. The Permittees' SUSMP identifies as potential Best Management Practices, the following BMPS: the reduction of impervious surfaces and increased landscaped areas; the direction of roof top runoff to pervious surfaces such yards; open channels of vegetated areas; the use of vegetated swales and strips in accordance with design criteria to be determined by the local jurisdiction; the use of extended/dry detention basins in accordance with the design criteria to be determined by the local jurisdiction; the use of infiltration basins, trenches, wet ponds, constructed wetlands, oil/water separators, catch basins inserts, continuous deflective separation units, storm drain inserts, media filtration, bioretention basins, dry wells, foundation planting, and other Best Management Practices, all in accordance with design criteria to be determined by the local jurisdiction. Additional requirements in the Permittees' SUSMP include the protection of slopes and channels, storm drain stenciling and signage, the proper design of common outdoor material storage areas, the proper design of common trash storages areas, the providing of proof of ongoing BMP maintenance, and various other requirements, all with the stated goal of reducing pollutants

"to the maximum extent practicable" in accordance with the Clean Water Act.

24. Pursuant to Resolution No. 99-03 adopted by the Regional Board on April 22, 1999, the Regional Board found that the approved BMPs "when implemented at development projects, in combination, will reduce pollutants and storm water discharges to the maximum extent practicable." Accordingly, pursuant to Resolution No. 99-03, the Regional Board has determined that the proposed and approved BMPs, when implemented, meet the Permittees requirements under the Clean Water Act, i.e., to reduce the discharge of pollutants to the maximum extent practicable (see 33 U.S.C. § 1342(p)(3)(B)) and, thus, the utilization of the approved BMPs in the Permittees' SUSMP is direct evidence of the Permittees' compliance with the Clean Water Act.

IV. RESPONDENTS HAVE FAILED TO COMPLY WITH THE ADMINISTRATIVE REVIEW PROCESS UNDER ORDER NO. 96-054

25. The Permit contains a very specific Administrative Review Process required to be followed by the Regional Board and the Executive Officer in reviewing Stormwater Programs to be developed under Order No. 96-054. Respondents, on January 26, 2000, acknowledged the application of this Administrative Review Process to the Permittees' SUSMP program.

26. The Administrative Review Process provides the procedure to be followed "for review and acceptance of reports and documents submitted to the Regional Board," and further provides for a method ***"to resolve any differences in compliance expectations between the Regional Board and Permittees, prior to initiating enforcement action."*** (Order No. 96-054, § 2.I.G.)

27. The Administrative Review Process also identified the process to be followed by the Executive Officer in determining whether the Permittees' SUSMP is sufficient and in compliance with the requirements of Order No. 96-054. Under the Administrative Review Process, the Executive Officer was required to notify the Permittees of his approval or disapproval of the Permittees' SUSMP program within 120 days of its submittal. If the Executive Officer does not respond within 120 days following submittal, the Permittees may notify the Regional Board of their intent to implement the program as submitted, and if after ten days the Executive Officer has not responded, the Permittee may implement "the submitted program" without modification by the

Executive Officer. Although the Permittees' SUSMP was submitted in July of 1999 and resubmitted in August of 1999, to date, the Respondents have failed to respond to the Permittees' SUSMP.

28. Further, under the Administrative Review Process, the Executive Officer was to send a "Notice of Intent to Meet and Confer" ("NIMC") to the Permittees, and was to outline ***"specific information"*** required to support his determination that the Permittees' SUSMP did not include sufficient controls to reduce pollutants to the maximum extent practicable. The NIMC is to include a timeframe by which the Permittees must meet with the Regional Board staff to demonstrate their program is sufficient to meet the requirements of the Permit, and if not, to seek clarification of the steps to be undertaken to comply with the requirements of Order No. 96-054. Further, under the Administrative Review Process and the plain language of Order No. 96-054, it is the Permittees' program, not a program submitted by some third party (including the Regional Board), that must be sufficient to comply with the terms of the Permit. To date, the Executive Officer has failed to provide the Permittees with an NIMC, and has failed to take action on the Permittees' SUSMP.

29. Moreover, under the Administrative Review Process, after an NIMC had been forwarded to the Permittees, Regional Board staff is required to meet and confer with the Permittees to allow the Permittees the opportunity to demonstrate ***"that the Permittees' program is sufficient to meet the requirements of this Order,"*** and if not, to seek clarification on the steps to be taken to meet the provisions of the Order. To date, the Executive Officer and staff have failed to comply with this requirement.

30. In addition, under the Administrative Review Process, the meet and confer period is to conclude with either a notice of program sufficiency to the Permittees, or with a submittal and acceptance by the Executive Officer of a written "Stormwater Program Compliance Agreement" ("SPCA"), which is to include implementation deadlines. The Executive Officer may terminate the meet and confer period after a reasonable period due to a lack of progress on issues and may order submittal of the SPCA by a specified date. To date, the Respondent Executive Officer has failed to comply with this requirement, and has never terminated the meet and confer

process let alone commenced it; nor has the Executive Officer ever submitted an order requiring the submittal of an SPCA by a particular date.

31. Furthermore, under the Administrative Review Process, the Respondent Executive Officer is required to approve or reject a submitted SPCA, or an amended SPCA, within 120 days of its submittal. If the Executive Officer rejects the SPCA, he is required to state the reasons for his rejection. To date, the Respondent Executive Officer has failed to approve or reject a submitted SPCA, as the Executive Officer has never commenced or terminated the meet and confer process and has never ordered the submittal of an SPCA.

32. Also under the Administrative Review Process, once a Permittee receives a rejection of an SPCA, the Permittee is to be given sixty (60) days to remedy the specified deficiency and resubmit the SPCA. If the Executive Office has not responded within 120 days following the submittal of an SPCA, a Permittee is to notify the Executive Officer of its intent to implement the SPCA as submitted, and if the Executive Officer has not responded within ten (10) days, the Permittee is entitled to implement the submitted SPCA. To date, the Respondent Executive Officer has failed to reject an SPCA, and has failed to give the Permittees an opportunity, upon such rejection, to submit within 60 days thereafter a remedy of the specified deficiency of the SPCA.

33. Finally, under the Administrative Review Process: ***"The Executive Officer shall not take enforcement action against a Permittee until the Executive Officer has notified the Permittee in writing that the Administrative Review Process has been exhausted and that the Executive Officer has determined that a violation exists warranting enforcement."*** (Order, Part 2.I.G.2.d.)

34. As of the date of this Petition, the Regional Board and the Executive Officer have failed to act on the Permittees' SUSMP in accordance with the Administrative Review Process under Order No. 96-054, and thus have failed to act in accordance with the requirements of the Clean Water Act and the Porter-Cologne Act.

V. THE REGIONAL BOARD SUSMP PROGRAM

35. On September 16, 1999, Regional Board staff unilaterally proposed changes to the

Permittees' SUSMP program and discussed those changes at a public workshop. At that time, however, neither the Regional Board nor the Executive Officer took any action on their SUSMP program, and instead continued their consideration of a unilateral Regional Board staff mandated SUSMP program for approximately ninety (90) days.

36. On January 26, 2000, the date of the action that is presently being challenged by the Petitioners herein, the Regional Board conducted a public hearing on a proposed SUSMP program submitted by its staff (but not the Permittees), and proceeded to ***direct*** its Executive Officer to approve an SUSMP program that was proposed by the Regional Board staff on December 7, 1999, as modified by staff through a change sheet dated January 25, 2000, and as further modified by the Regional Board itself at the hearing on January 26, 2000. (The SUSMP program proposed by staff as modified by the Board on January 26, 2000, is hereafter referred to as the "Regional Board SUSMP.") Copies of the December 2, 1999 program and the January 25, 2000 change sheet are attached hereto and collectively marked as Exhibit "B."

37. The Respondents' "public hearing" of January 26, 2000 complied with no procedural requirement under the Clean Water Act or the Porter-Cologne Act for the adoption or an amendment to a permit, or otherwise. Moreover, because of the last minute changes made by the Regional Board staff at the January 26, 2000 hearing, through the Change Sheet, which contained both substantive and non-substantive changes, Petitioners, and each of them, were not provided sufficient notice of the potential action to be taken by the Regional Board, and were furthermore not provided sufficient opportunity to be heard prior to the Regional Board's taking their action of January 26, 2000. In addition, at the public hearing, but after the close of public testimony, the Regional Board, in its deliberations, made a number of substantive changes to the proposed Regional Board SUSMP, including but not limited to requiring its application to all "non-discretionary" as well as "discretionary" projects, and including requiring the Permittees to adopt local ordinances within six (6) months of the date of the Executive Officer's signature of the order and to implement the proposed SUSMP program thirty (30) days thereafter. These changes and other changes made by the Regional Board after the close of public testimony resulted in the Petitioners being denied sufficient opportunity to be heard on such substantive changes and has

resulted in a denial of due process rights to the Petitioners.

38. By letter dated February 23, 2000, the record of the January 26, 2000 hearing, including transcripts of the hearing and audiotapes identifying the changes made by the Regional Board itself to the Regional Board SUSMP, was requested in accordance with this Petition. A true and correct copy of this letter requesting the preparation of the transcripts and the audiotapes is attached hereto and marked as Exhibit "C."

39. The Regional Board SUSMP greatly expands the obligations and requirements of the Permittees beyond the Permittees' SUSMP and therefore beyond the requirements of the Permit, the Clean Water Act, and the Porter-Cologne Act. Specifically, the Regional Board SUSMP imposes, among other requirements, the following requirements that are not included within the Permittees' SUSMP and that have not been agreed to by the Permittees pursuant to the Administrative Review Process or otherwise: (a) a requirement that the Permittees impose design standards/numerical mitigation measures to require the treatment of .75 inches of rainfall over a 24-hour period in nine (9) priority categories of development described below (hereafter referred to as the "Numerical Mitigation Standard"); (b) a requirement that the Permittees expand their SUSMP program to apply to all "non-discretionary" as well as "discretionary" projects within the nine project categories; (c) a requirement that the SUSMP extend to two (2) additional project categories, in addition to the seven (7) categories set forth in Order No. 96-054, i.e., parking lots of 25 spaces or more and "environmentally sensitive areas;" and (d) a requirement that the SUSMPs apply to all "redevelopment" within the nine (9) priority project categories (the term "redevelopment" is defined in the Regional Board's SUSMP to include the creation or addition of 50% or more impervious surfaces or the making of improvements of 50% or more of the existing structure).

40. Of critical importance is the Numerical Mitigation Standard mandated by the Regional Board's SUSMP, a provision that had not proposed or agreed to by the Petitioners. The .75 Numerical Mitigation Standard is a design standard for post construction projects whereby post-construction treatment control BMPs must be designed to mitigate (infiltrate or treat) storm water runoff to achieve 85% or more volume treatment. It is a design standard which the Regional

Board staff has determined will result in the treatment of up to .75 inches of rainfall over a 24 hour period for each and every storm event. As a result of this .75 Numerical Mitigation Standard, Permittees will be required to impose structural controls on new development and redevelopment in the nine (9) categories of development referenced below, to include among other things, extended detention basins on all such discretionary and non-discretionary projects, wet ponds, infiltration basins/ponds (which reduce the developable space), storm drain-connected oil/grease separators, catch basin inserts, grassy swales and other similar devices. The nine (9) categories of discretionary and non-discretionary development and redevelopment projects to which this requirement would apply are: (1) 100+ home subdivisions; (2) 10-99 home subdivisions; (3) 100,000 square feet commercial development; (4) automotive repair shops; (5) retail gasoline outlets; (6) restaurants over 5,000 square feet; (7) hillside located single family dwellings; (8) parking lots with 25 or more space (equivalent to approximately 5,000 square feet of surface area); and (9) development in unmapped areas known as "environmentally sensitive areas."

VI. RESPONDENTS' ACTIONS AND INACTIONS WERE INAPPROPRIATE, IMPROPER, AND IN VIOLATION OF THE PERMIT AND STATE AND FEDERAL LAW

41. The actions taken by the Regional Board on January 26, 2000, and any subsequent follow up action to be taken by the Executive Officer pursuant to such action, as well as the failure of the Respondents to comply with the terms of the Permit, were in conflict with the Permit, the Clean Water Act, and State law, were not supported by substantial evidence in the record or otherwise, and were arbitrary and capricious.

A. Respondents Have Failed To Comply With the Administrative Review Process And To Take Action On The Permittees' SUSMP Program In Accordance With The Requirements Of Order No. 96-054 And The Clean Water Act.

42. To date, as set forth above, neither the Executive Officer nor the Regional Board, have acted on the Permittees' SUSMP in accordance with the Permit. The Permit and the Administrative Process thereunder required that the Executive Officer notify the Permittees of the results of his review and approval or disapproval of their SUSMP program within 120 days of its

submittal. Although the Permittees' SUSMP was submitted to the Executive Officer in July of 1999, and thereafter resubmitted to address comments of the Executive Officer in August of 1999, to date neither the Executive Officer nor the Regional Board have reviewed the Permittees' SUSMP program to determine whether that SUSMP program will reduce pollutants "to the maximum extent practicable" in accordance with the requirements of the Clean Water Act.

43. Respondents, and each of them, as discussed above, have failed to comply with the requirements of the Administrative Review Process under Order No. 96-054, and have acted improperly and arbitrarily and capriciously in violation of its terms and in violation of the Clean Water Act and State law.

B. <u>Respondents Actions Were Not Authorized By The Permit, The Clean Water Act, Or The Porter-Cologne Act</u>.

44. Upon the issuance of a NPDES Permit pursuant to the Clean Water Act, Permittees who comply with the terms of the Permit and take action to "reduce pollutants to the maximum extent practicable" are in compliance with the Clean Water Act and State law. There is no provision in the Clean Water Act, the Porter-Cologne Act, or the Permit, that enables the Regional Board or its Executive Officer to impose *new requirements* that are inconsistent with the provisions of the Permit, and that are not required under the Clean Water Act or State law on the Permittees.

45. Under the final rule issued by U.S. EPA in December of 1999 entitled "National Pollutant Discharge Elimination System – Regulations For Revision Of The Water Pollution Control Program Addressing Stormwater Discharges," U.S. EPA recommends that the BMPs to be chosen, be appropriate for the local community, and recognized that MS4 operators are to have significant flexibility to develop post-construction controls as appropriate to address local concerns and to apply new control technologies as they become available. U.S. EPA further commented that "redevelopment" projects may have more site constraints that narrow the range of appropriate BMPs. In this same rule, U.S. EPA further determined that MS4 operators are to have flexibility to determine the appropriate BMPs to address local water quality concerns, and that such operators are to develop an appropriate combination of BMPs to be applied on a site-by-site

regional or watershed basis. (See 64 Federal Register 68722, *et seq.*) Even the definition provided within EPA's Final Rule for "redevelopment" differs significantly from the definition of "redevelopment" provided in the Regional Board SUSMP Program. The above shows that the mandated programs set forth in the Regional Board SUSMP are not programs mandated anywhere in the Clean Water Act or the regulations thereunder, and, more importantly, that such Regional Board SUSMP programs contradict the letter, spirit and intent of the Clean Water Act.

46. The action taken by the Regional Board on January 26, 2000, and any subsequent action taken by the Executive Officer, are similarly actions that were not authorized by the Permit. Specifically, the Regional Board had no authority to usurp the authority of the Executive Officer under the Permit and to mandate its own SUSMP program on the Permittees. For example, the Respondents' actions in requiring a SUSMP program on all "non-discretionary," as well as on "discretionary" projects is not authorized by the Permit, or state or federal law, and contradicts the express terms of the Permit. Similarly, the addition of two more priority project categories, i.e., the application of the Regional Board SUSMP program to environmentally sensitive areas and projects of 25 or more parking spaces, is inconsistent with the terms of the Permit and is similarly not authorized by state or federal law.

47. The Regional Board's action of January 26, 2000 is also a violation of the Permit and state and federal law as the Regional Board has substituted its discretion for the discretion of the Executive Officer (as provided for under the Permit issued by the Regional Board in July of 1996). The action taken by the Regional Board and the required direction provided to its Executive Officer is a direct violation of the Permit and state and federal law as the Permit specifically provides for the Executive Officer to review the Permittees' SUSMP in accordance with the Administrative Review Process under the Permit, and does ***not*** permit the Regional Board to eliminate the Executive Officer's discretion and to ignore the Administrative Review Process required by the Permit.

48. Further, neither the Clean Water Act, the Porter-Cologne Act nor the Permit, authorize the Respondents Regional Board and its Executive Officer, to mandate a program on the Permittees without first properly seeking an amendment to Order No. 96-054, or without the

existence of other legal authority to do so. The Clean Water Act requires the Permittees to require controls "to reduce the discharge of pollutants to the maximum extent practicable." Respondents have made no findings and submitted no evidence to show that the Regional Board's SUSMP will "reduce the discharge of pollutants to the maximum extent practicable," nor has the Regional Board submitted any evidence or made any findings to show that the Permittees' SUSMP program does not sufficiently "require controls to reduce the discharge of pollutants to the maximum extent practicable," or that the Regional Board SUSMP was necessary and superior to the Permittees' Program to "reduce the discharge of pollutants to the maximum extent practicable."

49. The actions of the Regional Board on imposing new requirements under the Order No. 96-054 are inconsistent with the Clean Water Act, the regulations thereunder, the Permit and state law, and were actions taken arbitrarily and capriciously.

C. **Respondents Have Failed To Present Evidence To Show That Regional Board SUSMP Is Cost Effective And That The Benefits To Be Obtained From The Implementation Of The Program Outweigh Its Costs.**

50. The Clean Water Act and the regulations thereunder, as well as the Porter-Cologne Act, all require that the controls to be imposed "to reduce pollutants to the maximum extent practicable" be cost effective. In its final rule on "National Pollutant Discharge Elimination System – Regulations For Revision Of The Water Pollution Control Program Addressing Stormwater Discharges," adopted in December of 1999, U.S. EPA specifically commented that President Clinton's Clean Water Initiative clarified "that the maximum extent practicable standard should be applied in a site-specific, flexible manner, ***taking into account cost considerations as well as well as water quality effects....***" (See 64 Federal Register 68722, 68732.)

51. To date, Respondents have failed to analyze and consider all potential costs involved in complying with their mandated SUSMP program, and failed to weigh the benefits of the program in light of all the potential costs, and failed to issue findings that the benefits of the program outweigh its costs and that the Regional Board SUSMP program was cost effective. As a result, said Respondents have violated the terms of the Clean Water Act and the regulations thereunder, as well as the Porter-Cologne Act, and the terms of the Permit itself.

52. Although the Regional Board failed to analyze the cost necessary to implement the Regional Board's SUSMP, evidence was submitted to the Board at the January 26, 2000 hearing which showed that the costs to implement the Regional Board SUSMP will be significant in terms of development costs, design costs, land costs and other costs, including environmental impacts. In fact, significant costs must be incurred to implement and comply with the Regional Board SUSMP by the Permittees, the building industry, the restaurant industry, all Petitioners herein, and all other persons and stakeholders impacted by the Regional Board SUSMP, in the form of land costs, significant development costs, design costs, implementation costs, maintenance costs, insurance costs, and various other costs, all of which will be passed on to the general public, making it more difficult to develop and redevelop property, and to provide low and moderate income housing and other affordable development.

53. The Regional Board and its Executive Officer and staff performed virtually no analysis on the cost effectiveness of the proposed Numerical Mitigation Standard and the other requirements imposed pursuant to the Regional Board SUSMP. As discussed above, the Clean Water Act requires an accounting of cost considerations. Further, California Water Code Sections 13165, 13225, and 13241 require a cost/benefit analysis before imposing such controls. Section 13225 specifically allows the Regional Board to require as necessary "any state or local agency to investigate and report on technical factors involved in water quality control or to obtain its own analysis of water; provided that the burden, including costs of such reports shall bear reasonable relationship to the need of the report and the benefits to be obtained therefrom." (Cal. Water Code § 13225(c).) Further, in establishing water quality objectives, the Regional Board is required to consider "economic considerations." (Cal. Water Code § 13241.) The failure of the Regional Board to establish any findings and to perform any cost benefit analysis to show that the mandated programs under the Regional Board SUSMP are necessary and cost effective is a violation of state and federal law.

54. Further, under Section 2.III.A.4 of the Permit, the Principal Permittee (the County of Los Angeles), in consultation with the other Permittees, is to develop a model program to inform developers seeking "discretionary approvals" (such as the approval needed where Urban

Storm Water Mitigation Plans are to be incorporated in the development process) of, among other things: (i) the development and construction of storm water management; (ii) the maximization of pervious areas and storm water infiltration (where geology and topography permit); and (iii) "***cost effective*** storm water pollution control measures." The Permit's requirement for developers to be informed of "cost effective storm water pollution control measures" is further evidence of the Permit's requirement that any "storm water pollution control measures" to be implemented must be "cost effective" before being imposed.

55. Respondents have submitted no evidence to show that the Regional Board SUSMP program is necessary and cost effective; nor have they submitted any evidence to show that the benefits to be obtained from such a program, particularly including the marginal benefits, if any, over the Permittees' SUSMP program, exceed the enormous costs of the Respondents' program.

D. <u>The Regional Board SUSMP Program Is Not Supported By The Evidence Or Findings And Has Not Been Shown To Reduce "Pollutants To The Maximum Extent Practicable In Accordance With State And Federal Law</u>.

56. The action taken by the Respondents herein is further a violation of state and federal law and the requirements of the Permit, as the Respondents failed to make the appropriate findings and to perform the necessary analysis and study to evidence any water quality benefits to be obtained from the imposition of the Regional Board's SUSMP instead of, and in place of, the Permittees' SUSMP. In short, the water quality benefits to be obtained from the Regional Board's SUSMP are undefined, untested, and unknown, and have not been shown to be controls which "reduce the discharge of pollutants to maximum extent practicable."

57. With the adoption of the Regional Board SUSMP, Respondents have failed to analyze the potential impacts on groundwater quality created by the introduction and infiltration of pollutants of concern through the soil and into the groundwater throughout the County of Los Angeles, and have failed to analyze the environmental characteristics of the potentially impacted groundwater quality, the groundwater quality conditions in issue and economic considerations, all as required under the Porter-Cologne Act (see, e.g., Cal. Water Code § 13241). In effect, Respondents have failed to conduct appropriate study, analysis and investigation into impacts on

the environment, the community, and the health and safety of the public that will result from the Regional Board SUSMP.

58. The potential significant environmental impacts not analyzed by the Regional Board include the impact of the Regional Board SUSMP on groundwater quality, vector and pest control, the creation of nuisances throughout the County, resulting property damage, as well as potential personal injury and liability created by compliance with the Numerical Mitigation Standard. For example, for a one acre development project, approximately 2,700 square feet of land would need to be dedicated to a detention basin large enough to hold some 20,000 gallons of water, at a cost of approximately $65,000 (inclusive of estimated land cost). The Regional Board's SUSMP has failed to account for the maintenance of such a detention basin and the liabilities associated with such, and the nuisance created by its development, including problems of vector control, the creation of additional potential hazardous and solid wastes, and the potential bodily harm and personal injury that may result from such an attractive nuisance.

59. In addition, Respondents provided no direction on how the Permittees were to proceed with the implementation of the mandated Regional Board SUSMP, how such programs could lawfully and reasonably and practicably be incorporated into existing Permittees' Codes for the building, construction, grading, and design of "discretionary" and "non-discretionary" projects, and how such building codes could realistically be properly reviewed, revised, and implemented throughout the entire County, within six (6) months from the Respondents' actions, as required by the Respondents on January 26, 2000.

60. Respondents failed to provide sufficient time in accordance with the timeframe set forth under Order No. 96-054 for Petitioners to properly implement the mandated SUSMP program and for the regulated industry and the general public to comply with its terms.

61. Respondents have failed to establish any findings to support a determination that the Regional Board SUSMP is protective of water quality, would result in the reduction of pollutants to the maximum extent practicable, is necessary and cost effective, and is implementable by the Petitioners.

E. **The Regional Board SUSMP Is A Mandated Program That Violates California Water Code Section 13360.**

62. California Water Code Section 13360 prohibits the Regional Board, as well as the State Board, from specifying in any order or set of waste discharge requirements, specific design, location, or types of construction or other particular types of compliance requirements. Section 13360 provides, in pertinent part, that: "No waste discharge requirement or other order of a regional board or the state board or decree of a court issued under this division shall specify the design, location, type of construction, or particular manner in which compliance may be had with that requirement, order, or decree, and the person so ordered shall be permitted to comply with the order in any lawful manner."

63. The Regional Board's SUSMP, by its terms, mandates the implementation of a specific Numerical Mitigation Standard and specific design standards to be complied with, in violation of California Water Code Section 13360.

F. **Action Taken By The Regional Board On January 26, 2000, Will Result In The Imposition Of Unfunded Mandates And A Violation Of The California Constitution.**

64. Respondents, by requiring compliance with the Regional Board's SUSMP's on the Permittees and other local governmental Petitioners, have imposed new programs and/or have required a higher level of service of existing programs that are not required or mandated under the Clean Water Act or under any federal regulations thereunder.

65. The actions of the Respondents in imposing various unfunded programs and mandates on Petitioners are violations of the provisions of the California Constitution, specifically Article XIII B, Section 6, of the California Constitution.

66. The final rule issued by U.S. EPA in December of 1999 entitled "National Pollutant Discharge Elimination System – Regulations For Revision Of The Water Pollution Control Program Addressing Stormwater Discharges" provides that, to the extent possible, NPDES Permitting authorities are to provide financial assistance to MS4s, which often have limited resources, for the development and implementation of local programs. In fact, in this same final rule, U.S. EPA strongly encourages states to provide whatever assistance possible to local

agencies. Although mandating its SUSMP program on petitioners and other persons throughout the County, Respondents have failed to provide any financial assistance to the Permittees to carry out the Regional Board's mandate.

67. In fact, in the final rule for Phase II cities, U.S. EPA determined that such rule contains a federal mandate that may result in expenditures of "$100 million or more in any one year for both state, local, and tribal governments, in the aggregate, and the private sector." (64 Federal Register 68722, 68797.)

68. As a result of the imposition of such onerous unfunded programs and mandates said Respondents have violated the California Constitution and the actions taken by the Respondents herein are therefore invalid and unconstitutional.

G. The Imposition Of The Regional Board's SUSMP Program Is A Violation Of The Administrative Procedures Act.

69. The Regional Board's action on January 26, 2000, and the numerous requirements and mandates set forth in its mandated SUSMP program, is equivalent to the adoption of regulations, requiring compliance with the California Administrative Procedures Act.

70. The California Administrative Procedures Act, in relevant part requires, prior to the adoption, amendment, or repeal of regulations, proper notice of such regulations, including a 45-day public notice requirement, and a 15-day notice requirement for non-substantial changes to the proposed regulations or changes thereto, prior to the hearing.

71. With the action taken on January 26, 2000, the Respondents failed to comply with the requirements of the Administrative Procedures Act. Specifically, Respondents failed to comply with the 45-day notice requirement as well as the 15-day notice requirement for non-substantial changes as the Board made substantial changes, even on the day of the hearing. For example, on the day of the hearing, the Regional Board deleted an exemption for roof top runoff and determined to apply the SUSMP program to all "non-discretionary," as well as "discretionary," projects, falling within the categories set forth thereunder.

72. The action taken by the Regional Board on January 26, 2000, is in violation of the California Administrative Procedures Act, and accordingly constitutes invalid and inappropriately

adopted regulations. (See, Cal. Gov. Code § 11340 *et seq.*)

H. Respondents Have Failed To Comply With The Requirements Of The California Environmental Quality Act.

73. The California Environmental Quality Act ("CEQA"), Public Resources Code Section 21000 *et seq.*, required that the Respondents review potential significant environmental impacts created by their actions, before taking the action described on January 26, 2000, and the subsequent action of the Executive Officer in carrying out the direction of the Regional Board.

74. The actions taken by the Regional Board on January 26, 2000 and the subsequent actions of its Executive Officer requiring the Permittees to implement the Regional Board SUSMP for all priority "projects" as described in the Regional Board's SUSMP, including both "discretionary" and "non-discretionary" projects, required compliance with the terms and provisions of CEQA, including a review of all potentially significant environmental impacts created by such a program.

75. Specifically, in proceeding with the "project" and the mandated requirements to be included in subsequent "projects," the Regional Board failed to consider a number of potentially significant adverse environmental impacts, including the impact of such projects on groundwater quality, vector and pest control, the generation of solid and/or hazardous wastes, the creation of various nuisances throughout the County, the reduction of available land for low and moderate income housing and other development, and the general impact of the development of infiltration basins/ponds, wet ponds, grassy swales and extended detention basins throughout the County. The failure of the Respondents to proceed in accordance with the requirements of CEQA is a violation of its terms and the regulations thereunder.

VII. A HEARING BEFORE THE STATE BOARD IS REQUIRED SINCE RESPONDENTS FAILED TO PROVIDE PROPER NOTICE OF THEIR PROPOSED ACTIONS AND FAILED TO PROVIDE PETITIONERS A SUFFICIENT OPPORTUNITY TO BE HEARD, THEREBY DEPRIVING THEM OF DUE PROCESS OF LAW AND PREVENTING THEM FROM PRESENTING AVAILABLE EVIDENCE.

76. The Regional Board SUSMP includes a number of substantive and non-substantive

changes set forth in the change sheet dated January 25, 2000, a change sheet not provided to the Petitioners until January 26, 2000 at the time of the hearing. The Regional Board SUSMP program further includes substantial changes made after the close of the public comment period on January 26, 2000, including changes made by the Regional Board to apply the Regional Board SUSMP to all "non-discretionary" as well as "discretionary" projects that fall within the nine (9) subject categories, and including the deletion of the "roof top" exemption set forth in the prior draft of the Regional Board SUSMP, as well as numerous other changes. Further, the Regional Board imposed a time frame of adopting ordinances and amending City Codes of six (6) months from the date the Executive Officer executes an order, with the Petitioners and some 85 cities throughout the County being required to implement the SUSMP within 30 days thereafter.

77. The numerous changes set forth in the change sheet of January 25, and the various substantive and non-substantive changes made by the Regional Board after the close of public testimony, without providing Petitioners sufficient notice of the Regional Board's consideration of these issues, and without providing Petitioners sufficient opportunity to be heard on such matters, constitutes a deprivation of due process of law and violates California's Open Meeting Laws. Petitioners are entitled to a full hearing before the State Board so that available evidence not presented to the Regional Board because of the Respondents improper and late notice to Petitioners, and because of Respondents making of substantive changes after the close of public testimony, may be fully presented and considered.

78. In addition, Respondents actions of January 26, 2000 are actions that were not authorized under Order No. 96-054, the Clean Water Act or the Porter-Cologne Act. To the extent that such action can be interpreted as amendments to Order No. 96-054 and/or new waste discharge requirements, Respondents, and each of them, have failed to comply with the public comment and notice requirements of the Clean Water Act, and the regulations thereunder and state law, and have failed to provide the Petitioners with sufficient notice of such amendments and sufficient opportunity to be heard, thereby again depriving Petitioners of their rights to due process of law by denying them a fair hearing.

VIII. REQUEST TO REGIONAL BOARD FOR PREPARATION OF RECORD AND FOR LIST OF PERSONS KNOWN TO REGIONAL BOARD TO HAVE AN INTEREST IN THE SUBJECT MATTER OF THIS PETITION

79. A copy of this Petition will be simultaneously served on Respondents Regional Board and its Executive Officer. A copy of a request to the Regional Board requesting the preparation of the Regional Board's Record in connection with this matter, including a request for a copy of the audiotapes and the reporter transcripts of the January 26, 2000 hearing, as well as a request for a list of persons the Regional Board has identified as having an interest in the subject matter of this Petition, has been served on the Regional Board. A true and correct copy of the letter setting forth such a request is attached hereto and marked as Exhibit "C."

VIII. A STAY IS NECESSARY PENDING STATE BOARD REVIEW OF THIS PETITION AND THE RELIEF SOUGHT HEREIN

80. A stay of the action taken by the Regional Board and any subsequent action to be taken by the Executive Officer in imposing the Regional Board SUSMP, in clear violation of the terms of the Permit and State and federal law, is necessary to avoid substantial harm to each of the Petitioners herein, the public at large, and all Permittees.

81. Without the issuance of a stay, the Petitioners and all Permittees, along with the public at large, may be forced to commence the implementation of very costly design standards and the Numerical Mitigation Standard, and to commence compliance with an invalid SUSMP program where there has been no showing that such action will result in the reduction of pollutants to the "maximum extent practicable," and where the result of such action will be the wasteful expenditure of millions of dollars of construction costs, design costs, land costs, maintenance costs, implementation and administrative costs, as well as the modification of countless municipal codes. A stay is further necessary because compliance with the Regional Board SUSMP may adversely impact groundwater quality throughout the County, creates nuisances and vector control problems, discourages development and redevelopment throughout the County, and increase the costs of low and moderate income housing and other developments.

82. Unless a stay is issued, compliance with the action taken by the Regional Board

and the Executive Officer will result in a diversion of significant resources toward an invalid SUSMP program and away from the Permittees' SUSMP program.

83. Accordingly, a stay of the action taken by the Respondents is necessary to minimize the substantial harm that will result to the Petitioner, the Permittees, the general public, and the members of the building, development and restaurant industries, as well as the additional harm that may result to the environment, including the waters of the State of California.

84. Further, a stay of the action taken by the Regional Board, pending review of this Petition, will result in little, if any, harm to other interested persons and the public. There is no identified benefit from the implementation of the Regional Board SUSMP over the Permittees' SUSMP, and the City Petitioners herein are prepared and will proceed with the implementation of their SUSMP, in accordance with the terms of Order No. 96-054.

85. No evidence has been presented by the Regional Board or its staff in the course of the hearing or otherwise, that would show that any delay in the implementation of the Regional Board's SUSMP program, as opposed to the Permittees' SUSMP, will result in substantial harm to the public. The harm that will result to Petitioners, the public, the regulated industry, and the State's groundwater if the Permittees are forced to comply with the action taken by Respondents, will far outweigh any alleged harm to interested persons and the public from the issuance of a stay.

86. As set forth above in the allegations in this Petition, substantial questions of both law and fact exist which must be resolved before a determination can be made on whether the action taken by the Regional Board and its Executive Officer, and the failure to act by the Executive Officer, are consistent with State and federal law and the terms of the Permit, and whether the determinations made by such Respondents are supported by law and the evidence in the record.

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WHEREFORE, Petitioners herein, and each of them pray as follows:

(1) that an Order be issued forthwith staying the action taken by the Regional Board on January 26, 2000 in connection with the Regional Board's SUSMP, and any related action of its Executive Officer, in violation of California Regional Water Quality Control Board, Los Angeles Region, Order No. 96-054 (NPDES No. CAS614001) Waste Discharge Requirements for Municipal Storm Water and Urban Run-Off Discharges within the County of Los Angeles, pending a hearing and/or a determination by the State Board on the validity of such action and/or the validity of the failure of the Executive Officer to act in accordance with the Administrative Review Process under Order No. 96-054;

(2) that Petitioners be provided a hearing before the State Board to present additional evidence that is available but that was not presented to the Regional Board at the January 26, 2000 hearing. Petitioners were denied due process of law and a sufficient opportunity to be heard when Respondents submitted changes through a January 25, 2000 change sheet which Petitioners did not have sufficient time to review and consider, and when the Regional Board itself, after the close of the public comment period proceeded to make additional substantive changes to the Regional Board SUSMP. Accordingly, Petitioners were denied the ability to provided sufficient evidence to the Respondents at the time of the hearing as they were provided insufficient notice of the proposed Regional Board SUSMP and as substantive changes were made to the Regional Board SUSMP after the close of public testimony. A hearing is therefore required before the State Board to address the issues Petitioner was prevented from addressing at the time of the January 26, 2000 hearing.

(3) that an Order be issued by the State Board setting aside the action taken by the Regional Board in connection with Order No. 96-054 on January 26, 2000, and any related action of Respondent Executive Officer, or, in the alternative, that the State Board modify such actions so that they are in compliance with the requirements of State and federal law and the requirements of Order No. 96-054;

(4) that an Order be issued by the State Board that Respondents comply with the requirements of the Administrative Review Process and that said Respondents process the

Permittees' SUSMP program in accordance with the requirements of Order 96-054;

(5) that an Order by issued by the State Board providing for such other and further relief as is just and proper;

(6) that costs, attorney fees and other expert fees incurred in pursuing this Petition be awarded to Petitioners.

Dated: February 24, 2000

Respectfully submitted

RUTAN & TUCKER LLP
RICHARD MONTEVIDEO
TERENCE J. GALLAGHER

By: _____
RICHARD MONTEVIDEO
Attorneys for Petitioners

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

July 21, 1999

IN REPLY PLEASE
REFER TO FILE EP-3

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Attention Technical Support Unit

Dear Mr. Dickerson:

COMPLIANCE FILE NO. 6948
MUNICIPAL STORMWATER PERMIT NO. CAS614001 - ORDER NO. 96-054
STANDARD URBAN STORMWATER MITIGATION PLANS (SUSMPs)

Enclosed are the Standard Urban Stormwater Mitigation Plans (SUSMPs) for your review and approval. As described in the National Pollutant Discharge Elimination System Permit, Part 2.III.A.1.c, the Principal Permittee, in consultation with the Permittees shall develop SUSMPs for use during planning and permitting of Priority Projects within the following development categories.

- a 100+ home subdivision
- a 10-99 home subdivision
- a 100,000+ square-foot commercial development
- an automotive repair shop
- a retail gasoline outlet
- a restaurant
- a hillside-located single-family dwelling

In addition to including input from the Permittees in the development of these SUSMPs, we twice distributed them to environmental groups, contractors, developers, consultants and applicable trade industries for their review and considered their comments in the development of the SUSMPs.

Also enclosed is a copy of the comments submitted by the City of Los Angeles. They are being sent with the SUSMPs at the City's request.

If you have any questions, please contact Tim Piasky at (626) 458-5969, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

TP:ma
P\...\ADMIN\LETTERS\SUSMP2.WPD

Enc.

cc: All Permittees

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your

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project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness

associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)
- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

R0072839

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
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Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

R0072840

100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Categorization as a commercial development of 100,000 or more square feet will be based on total impermeable area, including parking area, as opposed to lot size or building footprint.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100,000 Square Foot Commercial Development projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. MITIGATE STORMWATER RUNOFF

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. In designing your project to meet this requirement, you are not limited to the BMPs below.

In meeting this specific requirement, "treatment" of runoff will require the incorporation of a

BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Reducing Post-Development Runoff

Limiting impervious areas will help reduce the amount of site runoff generated. The following are examples, which can be used for this purpose (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

Mitigating Stormwater Runoff

The following are examples of Treatment Control BMPs that can be used for mitigating the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system (See Table 1: Suggested Resources for additional sources of information):

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)
- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)
- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)
- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

AUTOMOTIVE REPAIR SHOP

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

An automotive repair shop is a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Automotive Repair Shop projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. Therefore, design plans which include fueling areas must include the following:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating

anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.

- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

9. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959
Best Management Practice Guide Retail Gasoline Outlets (1997) Discusses appropriate BMPs for fueling and other closely related activities likely to be found at retail fueling operations.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

RETAIL GASOLINE OUTLET

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A retail gasoline outlet is primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Retail Gasoline Outlet projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements

need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. The project plans must include the following BMPs:

- Where feasible, fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.

- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.

- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

4. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

5. PROPERLY DESIGN TRASH STORAGE AREA

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

6. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater run-on or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

7. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1997) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
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Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

RESTAURANT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A restaurant is a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Restaurant projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

TABLE 1: SUGGESTED RESOURCES

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SINGLE FAMILY HILLSIDE RESIDENCE

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

"Hillside" is as defined by the local jurisdiction. For example, one jurisdiction defines "hillside" as a property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is 25% or greater, and where grading contemplates cut or fill slopes 30 feet high or greater.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for Single-Family Hillside Residence projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to

provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial/Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

August 12, 1999

IN REPLY PLEASE
REFER TO FILE: EP-3

Mr. Dennis Dickerson, Executive Officer
California Regional Water Quality
Control Board - Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013-1105

Dear Mr. Dickerson:

STANDARD URBAN STORMWATER MITIGATION PLANS

I am writing to clarify the intended meaning of some wording in the Standard Urban Stormwater Mitigation Plans (SUSMPs) submitted to you on July 21, 1999.

At the workshop held on August 10, 1999, regarding SUSMPs, you indicated that the following statement in the SUSMPs would be interpreted to mean that all runoff would need to be mitigated:

> "The development must be designed so as to mitigate (infiltrate and/or treat) the site runoff generated from impervious directly connected areas that may contribute pollutants of concern to the stormwater conveyance system".

The actual intent of that statement was to omit a numerical standard from the SUSMPs. Enclosed is a revised version of the SUSMPs to clarify the intended meaning.

If you have any questions, please call me at (626) 458-5948, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

Terri M Grant

TERRI M. GRANT
Supervising Civil Engineer III
Environmental Programs Division

TG:sv
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Enc.

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Post-it® Fax Note 7671	Date 8/12/99	# of pages ▶ 25
To Dennis Dickerson	From Terri Grant	
Co./Dept. CRWQCB	Co. LACDPW	
Phone # (213)576-6605	Phone # (626)458-5948	
Fax # (213)576-6625	Fax # (626)458-3534	

100+ HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

A 100+ home subdivision is defined as any subdivision lot being developed for more than 100 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100+ Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORMWATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high

enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by

promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)

- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)

- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)

- Storm drain inserts (Applicability and design criteria to be determined by the local jurisdiction)

- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)

- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

4. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be

posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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10 - 99 HOME SUBDIVISION

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Any subdivision lot being developed for 10 to 99 single-family or multi-family homes.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 10-99 Home Subdivision projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

4. MINIMIZE STORMWATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However, sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.

- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes; on-street parking; emergency, maintenance, and service vehicle access; sidewalks; and vegetated open channels.

- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered.

- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Use open space development that incorporates smaller lot sizes.

- Reduce building density.

- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration basins (Applicability and design criteria to be determined by the local jurisdiction)

- Infiltration trenches (Applicability and design criteria to be determined by the local jurisdiction)

- Wet ponds (Applicability and design criteria to be determined by the local jurisdiction)

- Constructed wetlands (Applicability and design criteria to be determined by the local jurisdiction)
- Oil/Water separators (Applicability and design criteria to be determined by the local jurisdiction)
- Catch basin inserts (Applicability and design criteria to be determined by the local jurisdiction)
- Continuous deflective separation units (Applicability and design criteria to be determined by the local jurisdiction)
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- Media filtration (Applicability and design criteria to be determined by the local jurisdiction)
- Bioretention facility (Applicability and design criteria to be determined by the local jurisdiction)
- Dry-wells (Applicability and design criteria to be determined by the local jurisdiction)
- Cisterns (Applicability and design criteria to be determined by the local jurisdiction)
- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.

- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN COMMON OUTDOOR MATERIAL STORAGE AREAS

Common outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials used in the routine maintenance of common areas or common facilities such as swimming pools, tennis courts, green belt areas, etc.

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans include common outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN COMMON TRASH STORAGE AREAS

A common trash storage area refers to an area where a trash receptacle or receptacles are located for use by more than one household or dwelling unit as a repository for household wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All common trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE



Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the structural BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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100,000 SQUARE FOOT COMMERCIAL DEVELOPMENT

STANDARD URBAN STORM WATER MITIGATION PLAN

DEFINITION

Categorization as a commercial development of 100,000 or more square feet will be based on total impermeable area, including parking area, as opposed to lot size or building footprint.

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, required the development and implementation of a program addressing stormwater pollution issues in development planning for private projects.

The requirement to implement a program addressing development planning is based on the primary objectives of the 1987 amendments to the Clean Water Act that established a framework for regulating stormwater discharges from municipal, industrial, and construction activities under the NPDES. The primary objectives are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable.

This Standard Urban Stormwater Mitigation Plan (SUSMP) was developed as part of the program addressing Development Planning for the private sector. The Permittees will use this SUSMP to develop their own citywide SUSMP. Discretionary projects (as defined by CEQA), that fall into one of the seven categories (10-99 Home Subdivision, 100+ Home Subdivision, Single-Family Hillside Residence, 100,000 Square Foot Commercial Development, Automotive Repair Shop, Retail Gasoline Outlet, and Restaurant) will need to implement the appropriate SUSMP requirements into their project plans. This SUSMP outlines the necessary Best Management Practices (BMPs) which must be incorporated into design plans for 100,000 Square Foot Commercial Development projects. Should any conflict be discovered with the new guidelines and any pre-existing regulation, the pre-existing regulation will prevail.

For development projects where the cost of new improvements exceeds a pre-determined threshold, the new and the existing improvements shall comply with this SUSMP. When the cost of new improvements is less than the pre-determined threshold, only the new improvements need to comply with this SUSMP. The pre-determined threshold shall be consistent with the local jurisdiction's policy for application of other building codes to new improvements.

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Peak storm water runoff discharge rates shall not exceed pre-development levels for developments where an increased peak storm water discharge rate may result in an increased potential for downstream erosion.

2. PROTECT SLOPES AND CHANNELS

If applicable, the project plans must include BMPs consistent with local code and ordinance to decrease the potential of slopes and/or channels from eroding and impacting stormwater runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.

Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion.

3. MINIMIZE STORMWATER POLLUTANTS OF CONCERN

Stormwater runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable (MEP), the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the stormwater conveyance system as approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna. DCIA is defined as the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the MEP. Those BMPs best suited for that purpose are, at a minimum, those listed in the California Storm Water Best Management Practices Handbooks as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated may, in a particular circumstance, be best suited to maximize the reduction of the pollutants.

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The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of DCIA, to the stormwater conveyance system. (See Table 1: Suggested Resources for additional sources of information):

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- Use permeable materials for private sidewalks, driveways, parking lots, or interior roadway surfaces (examples: hybrid lots, parking groves, permeable overflow parking, etc.).

- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

- Direct rooftop runoff to pervious areas such as yards, open channels, or vegetated areas, and avoid routing rooftop runoff to the roadway or the stormwater conveyance system.

- Vegetated swales and strips (Applicability and design criteria to be determined by the local jurisdiction)

- Extended/dry detention basins (Applicability and design criteria to be determined by the local jurisdiction)

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- Foundation planting (Applicability and design criteria to be determined by the local jurisdiction)

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- Signs and prohibitive language and/or graphical icons discouraging illegal dumping must be posted along channels and creeks.

- Legibility of stencils and signs must be maintained.

5. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Improper storage of materials outdoors can allow toxic compounds, oil and grease, heavy metals, nutrients, and suspended solids to enter the stormwater conveyance system. Where proposed project plans or activities may result in outdoor areas for storage or use of materials that may contribute pollutants to the stormwater conveyance system, the following structural BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.

- The storage area must be paved and sufficiently impervious to contain leaks and spills.

- Where feasible, the storage area should have a roof or awning to minimize collection of storm water within the secondary containment area.

6. PROPERLY DESIGN TRASH STORAGE AREAS



Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

7. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS



Loading/unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

8. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS



Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow stormwater runon or contact with stormwater runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

9. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

10. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons for water quality controls to not function as designed or to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included (or will be required to include) structural BMPs in project plans, Permittee staff will require that the applicant provide verification of maintenance provisions.

For all properties, this verification will consist of having the developer sign a statement declaring responsibility for all structural BMP maintenance until the time the property is transferred. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any structural BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility.

If structural BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. The structural BMP proposed for transfer will need prior approval from the County or other appropriate public agency and will be considered on a case by case basis.

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California Regional Water Quality Control Board
Los Angeles Region

Winston H. Hickox
Secretary for Environmental Protection

320 W. 4th Street, Suite 200, Los Angeles, CA 90013
Phone (213) 576-6600 FAX (213) 576-6640

Gray Davis
Governor

TO: **Los Angeles County Municipal Storm Water and Urban Runoff NPDES Permittees**
Long Beach Municipal Storm Water and Urban Runoff NPDES Permittees
Interested Parties

FROM: **Dennis A. Dickerson**
Executive Officer

DATE: **December 7, 1999**

SUBJECT: **Proposed Standard Urban Storm Water Mitigation Plan and Supporting Regional Board Resolution**

On September 16th, at the Regional Board meeting, I advised the Regional Board that additional time to develop a revised Standard Urban Storm Water Mitigation Plan proposal would be in the best interest to ensure that the proposal were more fully documented and supported by the record. At that time, I indicated that Regional Board staff would develop a revised proposal at the earliest opportunity but probably not less than 90 days later. This proposal has been developed and is being noticed through this memorandum to Permittees and Interested Parties. The proposal is also being mailed and placed on the Regional Board's Internet website.

The proposed Standard Urban Storm Water Mitigation Plan is designed to ensure that storm water pollution is addressed in one of the most effective ways possible, i.e., by incorporating Best Management Practices (BMPs) in the design phase of new development and redevelopment. The proposal also provides for numerical design standards to ensure that storm water runoff is managed for water quality concerns in addition to flood protection and that pollutants carried by storm water are retained and not delivered to waterways.

The proposed Standard Urban Storm Water Mitigation Plan adds two additional categories for controls, parking lots and environmentally sensitive areas. The proposal also attempts to respond to various concerns by incorporating provisions that allow for flexibility thereby recognizing that a single numerical standard may not be appropriate in every case. Also, the proposed Standard Urban Storm Water Mitigation Plan has taken the original language offered by the Principal Permittee and eliminates much of the duplication allowing for a more concise and understandable document.

A Tentative Resolution is also being offered to the Regional Board for their consideration at the January 6, 2000 Board Meeting. This Tentative resolution acknowledges the structure of both the Los Angeles and Long Beach Municipal Storm Water Permits by allowing the Standard Urban Storm Water Mitigation Plan approval to be accomplished by the Executive Officer for the Los Angeles permit while the Regional Board itself would approve the Standard Urban Storm Water Mitigation Plan pursuant to the City of Long Beach permit. If adopted by the Regional Board, the Tentative resolution would approve the Long Beach Standard Urban Storm Water Mitigation Plan while encouraging the Executive Officer to approve the Los Angeles Standard Urban Storm Water Mitigation Plan. In addition, the Regional Board is being asked to adopt the numerical design standards as the minimum standards for

post-construction BMPs required by the statewide general permit for construction activity for construction projects in the Los Angeles Region.

The September 16, 1999 public hearing was lengthy with many commentors. It is understood that many interested parties will again wish to speak before the Regional Board. In an effort to ensure that the Regional Board is provided with a comprehensive understanding of the concerns associated with this proposal, special arrangements for the presentation of comments are being considered. Specific details on the presentation arrangements for the January 6th Board meeting will be provided in the regular agenda notice. Interested parties are encouraged to contact the Executive Officer to suggest consolidation of comments from many parties into a more comprehensive presentation with an extended time limit.

If you represent a Permittee or other interested party, it would be helpful that by December 20, 1999 you would coordinate with other co-interested individuals and notify this office of (1) lead designated speaker; (2) amount of time needed by the lead speaker; and (3) your request for time for additional speakers and the identity of such additional speakers. The Board will announce the amount of time available for the submission of oral comments in this matter and for discussion among the Board members in the formal notice of the Board's agenda. Upon receipt of the above information, the staff will recommend an allotment of time for all interested parties, based upon the information received. Parties who have not submitted the requested information will be provided any remaining time following allotment.

CC Regional Board Members

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit, which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

- Effectively prohibit non-storm water discharges, and
- Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. This SUSMP applies to projects that are Priority Projects (Discretionary Projects) as defined by the NPDES Permit. The Permittees are required to use this SUSMP to develop their own citywide SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve an Urban Storm Water Mitigation Plan as part of the development process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

Discretionary projects, that fall into one of seven categories are identified in the NPDES Permit

as requiring SUSMPs. These categories are:

Single-Family Hillside Residences
100,000 Square Foot Commercial Developments
Automotive Repair Shops
Retail Gasoline Outlets
Restaurants
Home Subdivisions with >10 housing units*

* (Note: this category is two separate categories in the NPDES Permit)

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements. These categories are:

Location adjacent to or discharging to an environmentally sensitive area, and
Parking lot 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

DEFINITIONS

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"100,000 Square Foot Commercial Development" means Developments based on total impermeable area, including parking areas, as opposed to lot size or building footprint.

"Retail Gasoline Outlet" means a facility primarily engaged in selling gasoline and lubricating oils. These establishments frequently sell other merchandise, such as tires, batteries, and automobile parts. Frequently, these establishments also perform minor automotive repair work. Gasoline stations combined with other activities, such as grocery stores, convenience stores, or car wash facilities, are classified according to the primary activity.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope and where grading contemplates cut or fill slopes .

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539. Exceptions do apply for SIC codes 5013, 5014, and 5541. For SIC code 5013, if the business has no outside storage of any recycled oil or other hazardous substances, it is not included. For SIC code 5014, if the business does not engage in any repair work, it is not included. For SIC code 5541, if the business does not engage in any onsite repair work, it is not included.

"Restaurant" means a facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812)

"Parking Lot" means land area or facility for the parking of commercial or business or private motor vehicles.

"Environmentally Sensitive Area" means an area designated as an Area of Special Biological Significance by the State Water Resources Control Board or an area designated as a Significant Natural Area by the California Resources Agency or an area designated as an area of Ecological Significance by the County of Los Angeles.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both treatment control BMPs and source control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Infiltration" means the downward entry of water into the surface of the soil.

"Directly Connected Impervious Area (DCIA)" means the area covered by pavement, building and other impervious surfaces which drain directly into the storm drain without first flowing across pervious areas (e.g. lawns).

"New Development" means land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision.

Redevelopment" means, on an already developed site, the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; land disturbing activities related with structural or impervious surfaces .

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

CONFLICTS WITH LOCAL PRACTICES

Where provisions of the SUSMP requirements conflict with established local codes , (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMPs contained herein to be consistent with the code, except where those practices would defeat or circumvent the intent of the SUSMP requirements.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

Post-development peak storm water runoff discharge rates shall not exceed estimated pre-development levels for developments where an increased peak storm water discharge rate may result in a foreseeable increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Every effort shall be made to concentrate or cluster development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and or drought tolerant plants. Wherever practical, promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the stormwater conveyance system. The development must be designed so as to minimize, to the maximum extent practicable , the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as

approved by the building official. Pollutants of concern, as defined by the Permit, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a level high enough to be considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* . USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question..

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

If applicable, project plans must include BMPs consistent with local codes and ordinances to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the stormwater conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and or graphical icons discouraging illegal dumping must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials.
Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the stormwater conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the stormwater conveyance system, the following *structural* BMPs are required:

- Areas where materials are to be stored must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- Where feasible, the storage area should have a roof or awning to minimize collection of stormwater within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.
Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and or creeks. All trash container areas must meet the following *structural BMP* requirements:

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).
- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included, or is required to include, treatment control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and or Conditional Use Permits.

For all properties, this verification will include the developer's signed statement, as part of its project application, accepting responsibility for all structural BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for structural BMP maintenance. This transfer of property must have conditions requiring the recipient to assume responsibility for maintenance of any treatment control BMPs to be included in the sales or lease agreement for that property, and will be the owner's responsibility. For residential properties where the treatment control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&R's). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what stormwater management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. It will also encourage the transfer of this information with subsequent sale of the property.

If treatment control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Treatment control BMPs proposed for transfer must meet design standards adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR TREATMENT CONTROL BMPS

Treatment control BMPs selected for use at any project covered by this SUSMP shall meet the design standards of this Section unless specifically exempted.

Post-construction Treatment Control BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff from either:

1. each runoff event up to and including the 85th percentile 24-hour runoff event determined as the maximized capture storm water volume for the area, from the formula recommended in *Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)*, or

2. the volume of annual runoff based on unit basin storage water quality volume, to achieve 85 percent or more volume treatment by the method recommended in *California Stormwater Best Management Practices Handbook – Industrial/ Commercial*, (1993), or

3. the volume of runoff produced from each and every storm event up to and including 0.75 inch of rainfall, prior to its discharge to a storm water conveyance system, or

4. the volume of runoff produced from each and every storm event up to and including a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event.

AND

B. control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

The area of roofing surfaces may be excluded from the total area for calculation of rainfall or runoff volume to be treated provided:

a. the roofing materials will not be a source of pollutants of concern in storm water, and

b. storm water from the roofing surfaces is diverted directly to a storm water conveyance system, and

c. roof based exhaust systems, vents, filters, and air pollution control devices will not present a significant source of pollutants of concern in storm water, and

d. the storm water conveyance system does not directly or indirectly discharge to a natural stream or unlined channel or channel segment scheduled for restoration.

Exclusions

Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the requirements of this Section.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited

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2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle equipment washing steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

Outdoor equipment accessory washing steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, include in the project plans an area for the washing steam cleaning of equipment and accessories. This area must meet the following:

- This area must be self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If this wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the

following BMPs:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- Fuel dispensing areas should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- Fuel dispensing areas must be paved with portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

Vehicle equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. To alleviate this problem, consider including in the project plans an area for washing/steam cleaning of vehicles and equipment. If such an area is included in the site design, it must meet the following:

- This area must be self-contained, covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that deposit on these surfaces from motor vehicle traffic. These pollutants are directly transported to surface waters.

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code inc incorporating the treatment requirements of the SUSMP, provide for a waiver from the requirement if impracticability for a specific property can be established. Recognized situations of impracticability include (i) extreme limitations of space for treatment on a redevelopment project, (ii) unfavorable or unstable soil conditions at a site to attempt infiltration, and (iii) risk of ground water contamination because an underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately approved by the Regional Board Executive Officer before it becomes recognized and effective. A waiver granted to any development or redevelopment project may be revoked by the Regional Board Executive Officer for cause and with proper notice upon petition.

If a waiver is granted for impracticability, the Permittee must require the project proponent to transfer the savings in cost, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.

12. LIMITATION ON USE OF INFILTRATION BMPS

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA 600 R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

A Permittee may elect to accept a signed certification that the plan meets the criteria established herein and that the plan preparer has undergone training on designing BMPs to meet the numerical mitigation criteria, in lieu of conducting detailed BMP review to verify treatment control BMP adequacy. The training must have been conducted by an organization with storm

water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, or the California Water Environment Association) with the training and curriculum accepted by the Regional Board Executive Officer. For the certification to be valid, training must have been received not more than two years prior to the signature date on the plan.

SUGGESTED RESOURCES	HOW TO GET A COPY
Start at the Source (1999) by Bay Area Stormwater Management Agencies Association Detailed discussion of permeable pavements and alternative driveway designs presented.	Bay Area Stormwater Management Agencies Association 2101 Webster Street Suite 500 Oakland, CA 510-286-1255
Design of Stormwater Filtering Systems (1996) by Richard A. Claytor and Thomas R. Schuler Presents detailed engineering guidance on ten different stormwater filtering systems.	Center for Watershed Protection 8391 Main Street Ellicott City, MD 21043 410-461-8323
Better Site Design: A Handbook for Changing Development Rules in Your Community (1998) Presents guidance for different model development alternatives	Center for Watershed Protection 8391 Main Street Ellicon City, MD 21043 410-461-8323
Design Manual for Use of Bioretention in Stormwater Management (1993) Presents guidance for designing bioretention facilities.	Prince George's County Watershed Protection Branch 9400 Peppercorn Place, Suite 600 Landover, MD 20785
Operation, Maintenance and Management of Stormwater Management (1997) Provides a thorough look at stormwater practices including, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	Watershed Management Institute, Inc. 410 White Oak Drive Crawfordville, FL 32327 850-926-5310
California Storm Water Best Management Practices Handbooks (1993) for Construction Activity, Municipal, and Industrial Commercial Presents a description of a large variety of structural and good housekeeping BMPs.	Los Angeles County Department of Public Works Cashiers Office 900 S. Fremont Avenue Alhambra, CA 91803 626-458-6959

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TABLE 1 (Continued)

SUGGESTED RESOURCES	HOW TO GET A COPY
Second Nature: Adapting LA's Landscape for Sustainable Living (1999) by Tree People Detailed discussion of BMP designs presented to conserve water, improve water quality, and achieve flood protection.	Tree People 12601 Mullholland Drive Beverly Hills, CA 90210 818-753-4600 (?)
Florida Development Manual: A Guide to Sound Land and Water Management (1988 Presents detailed guidance for designing BMPs.	Florida Department of the Environment 2600 Blairstone Road, Mail Station 3570 Tallahassee, FL 32399 850-921-9472
Stormwater Management in Washington State (1999) Vols. 1-5 Presents detailed guidance on BMP design for new development and construction.	Department of Printing State of Washington Department of Ecology P.O. Box 798 Olympia, WA 98507-0798 360-407-7529
Maryland Stormwater Design Manual (1999) Presents guidance for designing storm water BMPs.	Maryland Department of the Environment 2500 Broening Highway Baltimore, MD 21224 410-631-3000
Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (1993) Report No. EPA-840-B-92-002. Provides an overview of, planning and design considerations, programmatic and regulatory aspects, maintenance considerations, and costs.	National Technical Information Service U.S. Department of Commerce Springfield, VA 22161 800-553-6847
Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide (Best Management Practices Handbooks (1998) Presents guidance for design of storm water BMPs	California Department of Transportation P.O. Box 942874 Sacramento, CA 94274-0001 916-653-2975

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TABLE 2: Example Best Management Practices (BMPs)

The following are examples of BMPs that can be used for minimizing the introduction of pollutants of concern that may result in significant impacts. generated from site runoff to the storm water conveyance system. (See Table 1: Suggested Resources for additional sources of information):

- Provide reduced width sidewalks and incorporate landscaped buffer areas between sidewalks and streets. However. sidewalk widths must still comply with regulations for the Americans with Disabilities Act and other life safety requirements.
- Design residential streets for the minimum required pavement widths needed to comply with all zoning and applicable ordinances to support travel lanes: on-street parking: emergency. maintenance. and service vehicle access: sidewalks: and vegetated open channels.
- Comply with all zoning and applicable ordinances to minimize the number of residential street cul-de-sacs and incorporate landscaped areas to reduce their impervious cover. The radius of cul-de-sacs should be the minimum required to accommodate emergency and maintenance vehicles. Alternative turnarounds should be considered
- Use permeable materials for private sidewalks. driveways. parking lots. or interior roadway surfaces (examples: hybrid lots. parking groves. permeable overflow parking. etc.).
- Use open space development that incorporates smaller lot sizes.
- Reduce building density.
- Comply with all zoning and applicable ordinances to reduce overall lot imperviousness by promoting alternative driveway surfaces and shared driveways that connect two or more homes together.
- Comply with all zoning and applicable ordinances to reduce the overall imperviousness associated with parking lots by providing compact car spaces. minimizing stall dimensions. incorporating efficient parking lanes. and using pervious materials in spillover parking areas.
- Direct rooftop runoff to pervious areas such as yards. open channels. or vegetated areas. and avoid routing rooftop runoff to the roadway or the storm water conveyance system.
- Vegetated swales and strips
- Extended dry detention basins
- Infiltration basin
- Infiltration trenches
- Wet ponds
- Constructed wetlands
- Oil Water separators
- Catch basin inserts
- Continuous flow deflection separation systems
- Storm drain inserts
- Media filtration
- Bioretention facility
- Dry-wells
- Cisterns
- Foundation planting
- Catch basin screens
- Normal flow storage separation systems
- Clarifiers
- Filtration systems
- Primary waste water treatment systems

STANDARD URBAN STORM WATER MITIGATION PLANS

SUMMARY OF COMMENTS RECEIVED AND RESPONSE

The comments received on the Standard Urban Storm Water Mitigation Plans (SUSMPs) and Regional Board staff response is divided into two sections. The first sections. lists main issues and staff response in detail. The second section summarizes all significant comments received by the Board on SUSMP before December 6, 1999, and the staff response including any actions taken to address the comment.

A. MAIN ISSUES AND RESPONSE

1 Comment:The Regional Board lacks regulatory discretion to establish a numerical mitigation measure for storm water treatment.

Response: The municipal storm water permit for Los Angeles County and Cities requires that SUSMPs achieve specific objectives which include to (i) minimize adverse impacts to natural communities; (ii) maximize infiltration to the extent practicable; (iii) minimize parking lot pollution; (iv) provide for appropriate controls to reduce storm water pollutant loads.[1] Staff interprets this provision of the permit, underlying federal law, and the statutory standard of Maximum Extent Practicable (MEP) as requiring SUSMPs to incorporate numerical mitigation measures for development planning projects in order to achieve compliance with water quality standards. Without a numerical mitigation measure, developers will select no treatment BMPs because there will be no BMP sizing guideline. Board Resolution No. 99-03 which states that "The Permittees shall select and require implementation of the most effective BMPs,...." will then be without effect.[2]

The 1987 Clean Water Act amendments give USEPA and States considerable discretion on establishing provisions for implementation in storm water programs.[3] Further, interim USEPA policy guidelines on BMPs for storm water programs explains that the permitting authority can require more specific conditions or limitations to meet water quality

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[1] Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles (Board Order No. 96-054; NPDES No. CAS614001) Part 2. III.A.2)

[2] The Regional Board adopted Resolution No. 99-03 approving BMPs for Development Planning and Development Construction on April 22, 1999.

[3] 33 U S C Section 1342(p)(B)(iii). "require controls to reduce the discharge of pollutants to the maximim extent practicable, including management practices, control techniques and systems, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of pollutants."

standards where adequate information exists.[4] In addition, courts accord administrative agencies a high degree of deference in the areas of law they regulate.[5]

2. Comment: Anti-degradation policy prohibits new construction when water quality is already impaired.

Response: The municipal storm water permit in agreement with federal storm water regulations requires controls on new development to reduce storm water pollution. There is no prohibition on new construction.

3. Comment: The numerical mitigation criteria mandates the capture of storm water which will require expensive land acquisition cost.

Response: The numerical mitigation measure defines the definite volume of storm water that must be treated for water quality benefits. Treatment is the application of any physical, biological, or chemical method that can be used to remove pollutants in storm water. Providing storage volume for the runoff or capture is one form of treatment. It is not mandatory and other options may be considered such as reducing impervious cover and promoting infiltration.

4. Comment: The proposed numerical mitigation measure is not based on science and is an arbitrarily agreed to number in settlement of a lawsuit.

Response: The proposed numerical measures are technically defensible. The measures are based on the principle that most rainfall events are in the smaller range and higher rainfall runoff producing events are less frequent. Designing storm water treatment controls for the smaller events will reduce storm water pollutant loads significantly while optimizing BMP costs. The primary numerical method to determine BMP design criteria is the maximized water quality treatment volume method recommended by the American Society of Civil Engineers (ASCE). The 0.75-inch rainfall event method happens to be also the one that was agreed to in a lawsuit settlement agreement between the NRDC and the County of Los Angeles. The four methods proposed as choices are equivalent variants and in a technical comparison were in agreement to within 10% of one another. It is highly probable that parties that settle a litigation select a numerical criterion that is reasonable and factual.

5. Comment: The numerical mitigation measure will require implementation of BMPs that have not been proven to be effective in the region.

Response: The proposed numerical mitigation measure defines the quantity of storm water (volume) that has to be treated to remove pollutants. This criterion does not in anyway describe the effectiveness of BMPs to be used. The effectiveness of any particular BMP is dependent on design parameters and the range for its applications. Physical geography has little influence on the effectiveness of BMPs while proper

[4] 61 Fed Register 43761. "The interim permitting approach uses best management practices in first-round strom water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary, to provide for the attainment of water quality standards. In cases where adequate information exists to develop more specific conditions or limitations to meet water quality standards, these conditions or limitations are to be incorporated into storm water permits, as necessary and appropriate."

[5] See e.g. Chevron U.S.A. v. Natural Res. Def. Council, (1984) 467 U.S. 837

maintenance is a big factor. Information on BMP effectiveness can be found in research reports and national BMP databases. The numerical mitigation measure in combination with the effectiveness of a BMP determines the overall annual load of pollutant that can be removed.

6 Comment: The post-construction treatment BMPs will require costly maintenance

Response: Treatment BMPs do require proper maintenance and maintenance costs are BMP specific. Poor or non-existent maintenance will result in an ineffective BMP. Information on BMP maintenance costs can be obtained from national databases and reports. See references in the Record of Decision. A cursory review indicates that maintenance costs are reasonable.

7. Comment: The Regional Board did not perform an economic analysis required by State and Federal law.

Response: The implementation of a federal regulation does not require separate economic analysis. A relative quantitative comparison performed with similar criteria for storm water management or flood control, sediment removal from construction, combined animal feedlot operations, and State of Washington water quality criteria indicated that the numerical mitigation criteria would cost about three to ten times less. In addition, staff performed BMP cost calculations for an actual site in Los Angeles in the process of development and determined that the mitigation criteria cost is less than 0.5 percent of the project cost.

8. Comment: The Regional Board did not provide adequate public notices to interested parties

Response: Regional Board action was not contemplated at the September Regional Board meeting and thus no public notice was necessary. Nevertheless, Board staff provided a 30-day public notice and mailed a copy to all parties on file. Staff was unable to verify the claim by some that they did not receive copies of the public notice or provide an explanation. Staff will again provide 30 day-notice of the proposed action on the SUSMPs scheduled by the Regional Board for January 6, 2000.

B. SUMMARY OF ALL SIGNIFICANT COMMENTS AND RESPONSE

COMMENTER	COMMENT	RESPONSE	ACTION
General City of Los Angeles Western States Petroleum Association	1. Conduct first a quantitative review of the basis of designation of selected categories as priority-planning projects.	The categories are designated in the permit and were selected based on risk sources data compiled in the first term of permit implementation	No action necessary
Los Cerritos Channel Task Force	2. Provide level playing field for unincorporated and incorporated cities within LA County	Four methods of determining the mitigation measure are provided to ensure some flexibility. The methods are equivalent. See ROD	Four equivalent methods included as mitigation criteria in SUSMP

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	3. No other MS 4 permits in California require numerical criteria for runoff mitigation	All MS4 permits are required to have controls on new development and redevelopment that will reduce pollutants to the MEP. The USEPA has identified the lack of specific criteria as a deficiency in its Report to Congress ON Phase II (1999)	No action necessary
SCAG	4. Provide the opportunity for the development of regional BMPs instead of site by site requirements	May be considered by Board in a Resolution	Will suggest interest to Regional Board
SCAG	5. Make the numerical mitigation measure voluntary pilot program for the first two years	Federal laws and regulations require that controls on new development and redevelopment be enforceable	No action necessary
Santa Monica	6. More studies not necessary to establish mitigation criteria and evaluate BMPs	We agree that there exists sufficient information to establish numerical mitigation criteria and to design BMP for optimum performance and effectiveness	No action necessary
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	7. Numerical mitigation measure is an unfunded mandate	Implementation of a federal permit program is not an unfunded mandate as described in the State constitution. See memo from legal counsel	No action necessary
Bellflower, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Long Beach, Los Angeles, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Clarita, Santa Fe Springs, Vernon, Whittier, BIA, EAC, New Hall Land and Farming, Long Beach Chamber of Commerce	8. Numerical mitigation measure is not based on sound science	Disagree. Our review of local data and implementation programs in states such as WA, FL, and MD indicates that the approach to establishing numerical mitigation measure is scientific and reasonable. The methods have also been endorsed by national science and engineering associations	References to important documents provided in the SUSMP. A bibliography of references reviewed for the action is included in the ROD
Bellflower, Cerritos, Claremont, Commerce, Covina, Diamond Bar, Downey, Huntington Park, Industry, Irwindale, Lakewood, La Mirada, Lomita, Long Beach, Lynwood, Maywood, Montebello, Paramount, Norwalk, Rancho Palos Verdes, Santa Fe Springs, Whittier	9. Treatment controls will be required irrespective of siting factors limiting application	Site conditions will determine what BMPs are appropriate. A provision for waiver is provided where mitigation may be infeasible. Mitigation banking may be an alternative	Waiver provision has been included in the SUSMP where impract cability is established
Covina, Irwindale, La Mirada, Lomita, Norwalk, Whittier	10. Provide sufficient time for Council of Governments to review and comment	Staff will mail and e-mail copies to SCAG for distribution to COGs.	Staff will mail public notice of proposed action to SCAG and COGs
Cerritos, Diamond Bar	11. Developers will move to build in counties without numerical mitigation measures	The mitigation measure requirement for new development is based on federal law. Other Regional Boards are likely to develop and evaluate compliance using similar criteria. The USEPA considers the absence of numerical storm water BMP design criteria for new development a deficiency. See USEPA Phase II Final Rule	No action necessary

COMMENTER	COMMENT	RESPONSE	ACTION
Bellflower Cerritos Claremont. Commerce Covina Diamond Bar. Downey Huntington Park, Industry. Irwindale Lakewood. La Mirada. Lomita Long Beach Lynwood. Maywood Montebello. Paramount Glendora. . Norwalk Rancho Palos Verdes Santa Fe Springs. Whittier. Truxaw and Associates. Long Beach Chamber of Commerce	12. BMPs will require costly maintenance	Maintenance of BMPs is essential and strategies to support maintenance activities are discussed in USEPA s Phase II Final Rule	No action necessary
Azusa. Claremont. EAC	13 Perform cost benefit analysis	The implementation of federal law does not require a separate cost benefit analysis. Relative cost comparisons and BMP cost calculations performed indicate that the cost of the mitigation measure is reasonable for the water quality benefits it will bring	No action necessary
Centex Homes Desert Partners. Bill Ehrlich FORMA Engineering Contractors Association. Greystone Homes John Laing Homes Mid-cities Escrow JTL New Hall Land and Farming New Urban West. Pace Engineering Pacific bay Homes Pacific Soils Engineering. David Placek. Psomas Ramseyer. Rasmussen Shea Homes. Sikand. Southern California Contractors. Southern California Ready Mix Concrete Assoc . South Place Corp SunCal Co . Taylsor Woodrow . Tetra Tech Van Tilburg and Associates. Warmington Homes Western Pacific Housing LA County Supervisor Knabe	14 SUSMP is stringent enough without the numerical mitigation measure	Without the numerical mitigation measure the SUSMP does not provide adequate guidance on design criteria for BMPs Thus no treatment BMPs or BMPs inadequately sized may be selected with no benefit to water quality The USEPA in the preamble to Phase II Final Rule makes the same observation	No action necessary
Technical Heal the Bay American Oceans Campaign Friends of the LA River. NRDC Kubo and Daniels Fusion Films Santa Monica BayKeeper. Ballona Wetlands Foundation. AHHA H & K Interiors. Kinsella & Associates AKERS Entertainment. Ballesteros Stenstrom-UCLA. Chatten Broan & Assoc . South Bay SurfRider (13 members). Shatz	15 Establish for all municipalities in LA County the 0 75-inch mitigation measure or similar criteria for development planning currently in effect for the unincorporated areas.	The proposed criteria provide for the treatment of 0 75 inch or equivalent volume of runoff from new development for all areas of LA County within the jurisdiction of the Regional Board	Criteria is made applicable to all MS4 permittees in LA county
Heal the Bay American Oceans Campaign Friends of the LA River.	16 Require SUSMPs for development in environmentally sensitive areas	The requirement is included for the City of Long Beach but was not one of the priority categories specifically identified in the LA County MS4 permit	This category has been added to the SUSMP
Heal the Bay American Oceans Campaign Friends of the LA River.	17 Require mitigation of runoff from parking lots separately in each SUSMP	This is not one of the priority categories specifically identified in the LA County MS4 permit Commercial categories specifically included have indicated that they are no different than parking lots In addition, the Coastal Commission has often consulted the Board for appropriate BMPs and criteria	This category has been added to the SUSMP

COMMENTER	COMMENT	RESPONSE	ACTION
NRDC	18 Apply SUSMP requirement broadly rather than limit it to seven categories	A BMP checklist is already required for other priority projects Expanding the SUSMP requirement may be appropriate once TMDLs have been allocated and other significant sources need to be controlled	Two categories have been added locations in environmentally sensitive areas and parking lots
County of Ventura and cities	19 Include an alternative method based on volumetric and flow which uses capture of annual runoff and peak flow rate control	An equivalent volumetric method is provided based on annual volume capture Flow rate controls are left to the judgement of the local agency	Eight five percent treatment of annual runoff volume is provided as an equivalent mitigation criteria
Heal the Ba, American Oceans Campaign Friends of the LA River	20. Define hillside development and not defer definition to the local municipality	Will provide a general definition	Defined in SUSMP
Heal the Ba, American Oceans Campaign Friends of the LA River	21 Apply requirements for retail gasoline outlets to any facility with a fueling dispenser	This is not one of the priority categories specifically identified in the LA County MS4 permit Expansion of the applicability may be appropriate once TMDLs have been allocated and other significant sources need to be controlled	No action necessary
USEPA San Gabriel Basin Water Quality Authority	22 Requirement for infiltration will promote pathways for groundwater and soil contamination	Risks for ground water contamination exist under certain situations These are identified in a report by the USEPA (1993) Pre-treatment of storm water will reduce such risks The soil acts as a natural filter and self regenerates	A section is included in the SUSMP describing the limitations of infiltration BMPs
Thrasher and Associates	23 Promote non structural BMPs	SUSMPs already require source control BMPs in addition to structural BMPs and treatment control BMPs	No action necessary
Land Tech Engineering	24 Provide design specifications for BMPs based on criteria	Expect that BMP design specification will be developed by the municipalities based on the numerical mitigation measure Interim BMP design information may be obtained from manuals developed by other states.	No action necessary
Certain Homes Engineering Contractors Assoc John Laing Homes Land Tech Engineering Pace Engineering Pacific Soils Engineering David Placek Ramsey/ Rasmusen, Sikand, Southern California Contractors, Southern California Ready Mix Concrete Assoc Tetra Tech, South Place Corp Taylor Woodrow Western Pacific Housing LA New Car Dealers Ass	25 Staff proposal requires capture which is not the same as infiltration or treatment	Storm water capture is not mandatory The proposal only requires that a certain quantity of storm water be treated with BMPs to remove pollutants in one of several ways	No action necessary
Vernon Los Angeles	26 Require similar criteria for USEPA Phase I industrial facilities	The requirements are for new development in selected categories Expansion to other categories may be considered for the next permit term Will recommend application to construction permits in the LA Region covered by the State General Storm Water permit for construction activity	Will propose to the Board to consider in its Resolution that the same
Brash	27 Filter media is not an effective BMP	Disagree Filter media are effective BMPs if properly configured See letter to Brash from RB Executive Officer date Oct 19 1999	No action necessary

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Clarita	26. Provide criteria for flow based controls in addition to volumetric based controls	Flow based controls which are essential to maintain BMP effectiveness reduce flow velocities minimize downstream erosion potential, and prevent over bank flooding are left to the judgement of the local agency.	A statement has been included in the SUSMP that flow design criteria be determined by the local agency
Santa Clarita	29. Limit application of criteria to impervious surfaces	The criterion is applied to the whole area Credit for the pervious areas is automatically considered through the runoff coefficient Roofing areas have been excluded for commercial facilities	No action necessary
Santa Clarita EAC	30. Provide greater flexibility in application of the mitigation criteria	The four methods of selecting the numerical mitigatio through criteria and waiver procedures offer sufficient flexibility in application	Provide in the SUSMP four equivalent methods of determining the numerical mitigation measure
Los Angeles	31. The numerical mitigation measure should be a guidelines and not a requirement for land development	Federal laws and regulations require that controls on new development and redevelopment be enforceable	No action necessary
Los Angeles	32. Setting a numerical mitigation measure is a discretionary action Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA	The requirements under an NPDES permit are exempt from review under CEQA Preliminary costing estimates indicate that they are reasonable	No action necessary
Los Angeles	33. Identify the regulatory authority which authorizes the Regional Board to establish the numerical mitigation measure	Regulatory requirement is found at 40 CFR 122.26 (d)(2)(iv)(A); (2) Statutory authority is at 33 USC 342(p)(B)(iii) See also court's opinion in Defenders of Wildlife v Browner (No 98-71080) (9th Cir. 1999) and in NRDC v USEPA 966 F2d 1292 (9th Cir 1992)	No action necessary
Los Angeles	34. Setting a numerical mitigation measure is a discretionary action. Provide cost estimates of impacts and benefits and release documentation for public comment and review under CEQA	The requirements under an NPDES permit are exempt from review under CEQA Preliminary costing estimates indicate that they are reasonable	No action necessary
Western States Petroleum Association (WSPA)	35. Postpone consideration because of inadequate notice	A thirty-day notice on this action has been provided A thirty-day notice on the September 1999 Board meeting was provided even though it was not required for a Regional Board information item	No action necessary
Apartment Association, BIA	36. There is no regulatory requirement that there be a numerical measure	Disagree. See detailed explanation under main issues and response.	No action necessary
NRDC	37. Receiving water limits and anti-degradation policies apply independently from mitigation criteria	Agree that mitigation standards are separate from the numerical mitigation measure The Office of Chief Counsel confirms that MS4 programs must meet water quality standards in a memo dated October 14, 1999	No action necessary
Burke Williams & Sorenson	38. Provide broad legal authority for the SUSMP requirement	We will include legal citations that are relevant to the jurisdiction of the Regional Board	Relevant laws are cited in the SUSMP to provide legal justification
Burke Williams & Sorenson	39. Delay SUSMP requirements in light of PL 106-74 requiring USEPA to submit reports to Congress	The USEPA has already submitted the reports to Congress and thus no delay is warranted	No action necessary

COMMENTER	COMMENT	RESPONSE	ACTION
Santa Monica Baykeeper	40. New development can be prohibited under the Federal Anti-degradation policy if it degrades or adds pollutants to local waters	Disagree. See detailed explanation under main issues and response	No action necessary
EAC Downey Lakewood	41. Provide authority in the Clean Water Act to regulate flow to address water quality.	The U.S. Supreme Court has held that regulation of flow to protect beneficial uses is within the authority of the Clean Water Act PUD No. 1 v. WA Dept. of Ecology 511 U.S. 700 (1994)	No action necessary

TENTATIVE

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION

Resolution No. xx-xx

APPROVING THE RECORD FOR
STANDARD URBAN STORM WATER MITIGATION PLAN
FOR
MUNICIPAL STORM WATER AND URBAN RUNOFF MANAGEMENT PROGRAMS
IN LOS ANGELES COUNTY

WHEREAS, THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION FINDS:

1. On July 15, 1996, a municipal storm water permit was issued to the County of Los Angeles and 85 incorporated cities to control and minimize the discharge of pollutants associated with storm water and urban runoff. This permit became Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles.

2. On June 30, 1999, a municipal storm water permit was issued to the City of Long Beach which removed the City of Long Beach from Board Order No. 96-054, giving the City of Long Beach its own distinct Municipal Storm Water and Urban Runoff NPDES permit, Regional Board Order No. 99-060, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the City of Long Beach.

3. On August 19, 1999, a statewide general storm water permit for construction activity was adopted by the State Water Resources Control Board (State Board). This permit became State Board Order No. 99-08-DWQ, and applies to construction projects that disturbs five acres or more or is part of a larger common plan of sale in the Los Angeles region.

4. Many of the rivers and streams in Los Angeles County are formally designated as impaired, pursuant to Section 303 (d) of the federal Water Pollution Control Act, for specific pollutants that are commonly found in storm water and urban runoff.

5. Storm water runoff carries with it many pollutants in varying concentrations that are suspended in, and or dissolved, in the runoff. The sources of these pollutants include nearly all properties that have been developed since the pollutants originate through the many diverse activities of habitation and land use. Pollutants generated from individual property developments vary greatly in the concentration or loading of each pollutant. Generally, the relative contribution of the pollutant from runoff from any individual property development will represent only a small portion of the entire loading of a water body given the many square miles of land upon which storm water runoff is generated. When the individual contributions from tens of thousands of discrete property units are aggregated, the pollutant loading becomes significant. The resultant pollutant loads results in the impairment of that water body and the conveyance of pollutants, including sediments, metals, complex organic compounds, oil and grease, nutrients, and pesticides to the ocean and harbors within Los Angeles County. The loading of pollutants generated in the Los Angeles area are being measured through the monitoring program being conducted by the Los Angeles County Department of Public Works in conformance with its obligations as the Principal Permittee under the Los Angeles County Municipal Storm Water and Urban Runoff NPDES permit.

6. The nature of property use is related to the types and quantities of pollutants that are transported from that property during a rainfall event.

7. As property is developed or redeveloped, the utilization of Best Management Practices provide an opportunity to reduce the loading of pollutants to water bodies. This is accomplished by various techniques and can be passive (source reduction) or active (treatment). As property is developed from undisturbed lands, the project can be designed to incorporate structural BMPs that would normally not be available or practical to use on property that has been in urban use.

8. BMPs are effective means of reducing pollutants and treatment control BMPs can be "designed-into" a project in a cost effective way and in a manner that is either transparent to or which enhances the use to which the property has been placed. Some BMPs encourage the setting aside of areas as a greenbelt to allow storm water runoff to flow over areas which are permeable, thereby allowing all or a portion of the runoff to infiltrate. Other BMPs can be designed and built into structures such as catch basins that incorporate replaceable filters to absorb oily wastes or by installing screens to prevent litter from passing through the system and into the water body.

9. Arrays of treatment control BMPs are available to developers of both new and redevelopment properties. The use of BMPs is already required by the terms of the Los Angeles County and Long Beach Municipal Storm Water and Urban Runoff NPDES permits.

10. The ability of any BMP to be effective is limited by the volume of water that the BMP is exposed to in any discrete period of time. A BMP that can only be effective for a small volume of storm water runoff is inherently less effective than one sized to accommodate a larger volume of water.

11. Storm water runoff will normally convey a disproportionate loading of pollutants in the initial period runoff is generated during a storm event. Storm events generating up to 0.75 inches of precipitation, measured over a 24-hour period, constitute 85 percent of the total amount of runoff that can be expected during an average wet season. Designing a BMP to be able to accommodate this amount of runoff will result in the application of a BMP intervention to all but 15% of the total runoff during a year, and usually all of the critical runoff that occurs in the early phase of the precipitation event, commonly referred to as the "first Flush."

12. Both the Los Angeles County (Part III.A.1.c) and the Long Beach Municipal Storm Water and Urban Runoff permits contain provisions related to the adoption of Standard Urban Storm Water Mitigation Plans (SUSMPs) requiring their development and implementation.

13. Standard Urban Storm Water Mitigation Plans are required for a specified set of discretionary "Priority Projects" and the permit specifically identifies seven distinct categories for which SUSMPs are required to be prepared. The permit specifically states that the seven categories of "Priority Projects" are the minimum categories requiring SUSMPs.

14. Standard Urban Storm Water Mitigation Plans are also required for development or redevelopment of Parking Lots 5,000 square feet or greater and Locations in Environmentally Sensitive Areas. These categories have been added to advance efforts to control storm water pollution beyond the minimum in Los Angeles County.

15. Standard Urban Storm Water Mitigation Plans are required to be approved by the Regional Board Executive Officer following which they are to be implemented by the Permittees and used by the Permittees as the minimum criteria for the approval of project specific Urban Storm Water Mitigation Plans and the issuance of grading or building permits to project applicants.

16. The statewide general storm water permit for construction activity requires that Storm Water Pollution Prevention Plans (State SWPPPs) contain post-construction BMPs that will be implemented after construction is complete.

17. Section 402 (p) of the Clean Water Act requires the Administrator of the United States Environmental Protection Agency or her designated agent, in this instance, the Regional Board, to require as part of the storm water program "controls to reduce the discharge of pollutants to the maximum extent practicable, including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants." [USC Section 1342 (p)(3)(B)].

18. A recent decision of the United States 9th Circuit Court of Appeals, Defenders of Wildlife v. Browner (1999) Case No. 98-71080, provides additional support and clarification of the authority of the Administrator and the Regional Board to impose additional controls on storm water pollution. The Court in Defenders of Wildlife v. Browner said that the USEPA and the States have discretion under the law to determine what pollution controls are appropriate to achieve compliance.

19. Pursuant to the requirements of Regional Board Order No. 96-054, Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, the Regional Board Executive Officer received a proposal for Standard Urban Storm Water Mitigation Plans submitted by the Principal Permittee.

20. Upon the review of the Regional Board Executive Officer, the Standard Urban Storm Water Mitigation Plan submitted for the seven applicable categories was deemed inadequate. A revised SUSMP proposal was developed subsequent to a discussion of the proposal's conceptual foundation at a public workshop held on August 10, 1999. This workshop was well attended with over 80 municipal representatives and interested parties participating.

21. On August 16, 1999, a public notice was issued indicating that the Standard Urban Storm Water Mitigation Plans proposed by the Principal Permittee would be augmented by the addition of criteria related to specifying numerical design criteria for BMP construction. The matter was noticed for the Regional Board's September meeting to allow the issue to be discussed before the Board although no formal action of the Regional Board itself is required for SUSMP approval.

22. On September 16, 1999, the Regional Board conducted a public hearing on the Standard Urban Storm Water Mitigation Plan proposal as amended by the Executive Officer. At that hearing, the Regional Board Executive Officer suggested additional time would be necessary to develop a more comprehensive proposal incorporating the comments received at the public hearing.

23. Between September 16 and December 3, 1999, the Regional Board Executive Officer met with interested parties to discuss comments and concerns from interested parties.

24. The Southern California Council of Governments (SCAG) has indicated its interest in obtaining funding to prepare a regional plan(s) to address storm water pollution and identify regional treatment solutions for implementation.

25. On December 7, 1999, the Regional Board Executive Officer released a revised Standard Urban Storm Water Mitigation Plan document to interested parties.

THEREFORE BE IT RESOLVED THAT:

1. The Regional Board endorses the Standard Urban Storm Water Mitigation Plan prepared by the Regional Board Executive Officer and noticed to the public on December 7, 1999 and the concepts therein relating to numerical storm water mitigation standards for Best Management Practices; and

2. The Regional Board encourages the Regional Board Executive Officer to approve the Standard Urban Storm Water Mitigation Plan at the earliest opportunity incorporating any specific changes recommended and formally approved by the Regional Board at the January 6, 1999 Board Hearing.

3. The Regional Board adopts the approved requirements as provisions applicable to the SUSMP requirements for the City of Long Beach.

4. The Regional Board adopts the numerical mitigation standards for storm water, endorsed herein, as the minimum design criteria for review of post-construction BMPs in the Los Angeles Region for construction projects subject to coverage under the state storm water general permit for construction activity.

5. The Regional Board encourages the Permittees and all interested parties to work together in a spirit of cooperation to effect the implementation of the Standard Urban Storm Water Mitigation Plan at the earliest possible date, and

6. The Regional Board encourages the efforts by the Southern California Council of Governments and area Council of Governments (COGs) to develop regional plans and identify regional solutions to address storm water pollution from new development and redevelopment.

I, Dennis Dickerson, Executive officer, do hereby certify that the foregoing is a full, true and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on January 6, 2000.

DENNIS A. DICKERSON
Executive Officer

STANDARD URBAN STORM WATER MITIGATION PLAN

DEVELOPMENT PLANNING

CHANGE SHEET (Revised)

Summary

The Change Sheet lists proposed changes to the Final Tentative - Standard Urban Storm Water Mitigation Plan, (December 7, 1999). In general, the proposed changes respond to commenters' suggestions on improving clarity, format, and implementability of the Standard Urban Storm Water Mitigation Plan.

Noteworthy changes include, the addition of a definition for 'storm event' and the requirement of professional registration for certifying persons under the "Alternative Certification' option. Two new references have been added to augment implementation guidance. These are, (i) National Stormwater Best Management Practices (BMP) Database, Version 1.0, and (ii) Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices.*

In the Change Sheet, cross-reference to pages and paragraphs are for the 'Clean Version' dated December 7, 2000. New text added to a sentence is indicated by underline.

Background

1. Page 2 paragraph three, Clarify that a City has to adopt same requirements for the Citywide SUSMP

   Sentence changed to read, "The Permittees are required to adopt the requirements set herein in their own SUSMP."

2. Page 2 paragraph 3. Delete reference to Urban Storm Water Mitigation to avoid confusion

   Sentence changed to read, "Each Permittee will approve the project plan as part of the development plan approval process....

3. Page 3 paragraph 2, Clarify the environmentally sensitive area category.

   Sentence changed to read, "Location within or directly adjacent to or discharging directly to an environmentally sensitive area.

4. Page 3 paragraph 2, Make requirement applicable to stand-alone parking lots only

   Sentence changed to read, "Commercial stand-alone parking lots 5,000 square feet or more.....

Definitions

5. Order definitions alphabetically

   Definitions reordered alpha-numerically

6. Page 3, Modify definition of hillsides to add specificity.

   Definition changed to read, "property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater."

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7. Page 3, Delete exceptions in the definition of Automotive Repair Shop

   Exceptions deleted, now reads, "Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539."

8. Page 3, Modify definition of 100,000 square foot commercial development for simplicity.

   Definition changed to read, "any commercial development that creates at least 100,000 square feet of impermeable area, including parking areas".

9. Page 4 , Add references for definition of environmentally sensitive areas

   References added for Areas of Special Biological Significance and Area of Ecological Significance.

10. Page 4. . Change definition to include a threshold trigger for requirements to apply to Redevelopment

    Definition changed to read. "Redevelopment" means, on an already developed site, the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes.....

11. Page 5. . Change definition for Retail gasoline outlets to clarify 'primarily engaged'.

    Definition changed to read. ""Retail Gasoline Outlet" means a facility engaged in selling gasoline and lubricating oils, which derives more than fifty percent of its annual gross receipts from the sale of gasoline, lubricating oils tires, batteries, automobile parts and other automotive services.

12. New Definition. Define a storm event

    Defined storm event to mean, "a rainfall event that produces more than 0.1 inch of precipitation and that, which is separated from the previous storm event by at least 72 hours of dry weather."

SUSMP Provisions Applicable to All Categories

13. Page 5, paragraph 3. Change sentence for clarity

    Sentence changed to read. "....shall not exceed the estimated pre-development rate for developments where it is reasonably foreseeable that the increased peak storm water discharge rate will result in increased potential for downstream erosion."

14. Page 5, paragraph 4, Delete text that makes act dependent on effort

Sentence changed to read. "Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition."

15. Page 6, paragraph 1, Change sentence for clarity

    Sentence changed to read. "...or the detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and/or flora and fauna."

16. Page 6, paragraph 2, Add reference

    Added reference. "Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best Management Practices*"

17. Page 6, paragraph 3, Add text to enable BMP combination alternative

Added text to read, "However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants".

18. Page 6, paragraph 4, Delete text that is tentative

Text deleted to read, "Project plans must include BMPs consistent....."

19. Page 6, paragraph 4, Add text to promote use of natural drainage systems

Add text to read, "Utilize natural drainage systems to the maximum extent practicable"

19. Page 6, paragraph 4, Add text to minimize flow to natural drainage systems

Text added to read, "Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable"

20. Page 7, paragraph 2, Change sentence for clarity

Sentence changed to read, "Materials with the potential to contaminate storm water must be: (1) placed in an enclosure..."

21. Page 7, paragraph 3, Add text to exclude single family residences

Sentence added to read, " Individual single family residences are exempt from these requirements"

22. Page 8, paragraph 1, Change text for clarity

Text changed to read, "The transfer of property to a private or public owner must have conditions..."

23. Page 8, paragraph 1, Add text to require maintenance inspection and record.

Sentence added to read, "The condition of transfer may include a provision that the property owner conduct maintenance inspection of all treatment control BMPs at least once a year and retain proof of inspection."

24. Page 8, paragraph 3, Delete text for clarity

Text deleted, "~~each runoff event up to and including~~", Now reads, "the 85th percentile 24-hour runoff event...."

25. Page 8, paragraph 3, Correct based on revised chart treatment volume from 85 percent to 80 percent.

Text changed to read, "to achieve 80 percent or more volume treatment....."

26. Page 8, paragraph 3, Change text for clarity

Sentence changed to read, "....runoff produced from a 0.75 inch storm event, prior..."

27. Page 8, paragraph 3, Change text for clarity

Sentence changed to read, "....volume of runoff produced from a historical-record based reference 24-hour rainfall criterion...."

28. Page 9, paragraph 2, Change text to offer partial credit for roofing surfaces diversion

    Sentence changed to read, "A proportional area of roofing surface may be excluded..."

29. Page 9, paragraph 2, Change text for clarity.

    Sentence changed to read, "storm water conveyance system does not directly discharge to a natural stream or channel segment scheduled for restoration".

30. Page 9, paragraph 3, Change text to clarify exemption from numerical standard only.

    Sentence changed to read, "Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical BMP design standard requirement.

Provisions Applicable to Individual Priority Projects

31. Page 10, paragraph 2, and Page 12, paragraph 1, Change text to eliminate mandatory cover.

    Sentence change to read, "...area must be self-contained and/or covered, equipped with a clarifier...."

32. Page 12, paragraph 3, Change text for clarity.

    Text modified to read, "....hydrocarbons that are deposited on parking lot surfaces by motor vehicles"

33. Page 12, paragraph 3, Add introductory text.

    Sentence added to read, "To minimize the offsite transport of pollutants, the following design criteria are required".

Waiver

34. Page 13, paragraph 1, Add text for clarity

    Text added to read, "....because an existing or potential underground source of drinking water..."

35. Page 13, paragraph 1, Change text to clarify that Permittee is petitioner.

    Sentence modified to read, "Any other justification for impracticability must be separately petitioned by the Permittee and approved...."

Alternative Certification

36. Page 13, paragraph 1, Change sentences to require professional registration and recommend training verification.

    Sentences added to read "...accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria." And, "The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date."

Suggested Resources

37. Page 15, Add reference BMP database and on-line Texas Non-point Source Book

    Reference added, "National Stormwater Best Management Practices (BMP) Database, Version 1.0" ; and "Texas Non-Point Source Book".

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February 23, 2000

VIA FACSIMILE AND FIRST CLASS MAIL

Mr. Dennis A. Dickerson
Executive Officer
California Regional
Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Re: **Waste Discharge Requirements And NPDES Permit For Municipal Storm Water And Urban Run Off Discharges In The County Of Los Angeles (Order No. 96-054, NPDES No. CAS 614001) - Petition To State Board For Action Taken By Regional Board On January 26, 2000**

Dear Mr. Dickerson:

In connection with the upcoming filing of a Petition to the State Water Resources Control Board concerning the actions of the Regional Board and its Executive Officer on January 26, 2000, and their failure to act on the Permittees' SUSMP, as well as their failure to act in accordance with the Administrative Review Process under Order No. 96-054, the Clean Water Act, and the Porter-Cologne Act, this office is in the process of preparing a Petition to the State Water Resources Control Board.

Pursuant to Title 23 of the California Code of Regulations, Section 2050, please have the Regional Board's Record on this matter prepared, including a copy of the tape recording of the Regional Board's hearing on January 26, 2000, as well as a copy of the Reporter's transcript.

In addition, pursuant to the regulations and in furtherance of the Petition to the State Board, please have a list of persons that are known to the Regional Board to have an interest in the subject matter of this Petition prepared, and have copies of such list forwarded to this office and the State Board, as well as all Petitioners.

Thank you for your assistance in this matter, and please do not hesitate to contact me should you have any questions.

Sincerely,

RUTAN & TUCKER

Richard Montevideo

RM:hd

PROOF OF SERVICE BY OVERNIGHT DELIVERY

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over the age of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fourteenth Floor, Costa Mesa, California 92626-1950.

On February 24. 2000, I served on interested parties in said action the within:

PETITION FOR REVIEW OF JANUARY 26, 2000 ACTION OF THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION, AND ACTIONS AND FAILURES TO ACT BY IT AND ITS EXECUTIVE OFFICER, DENNIS DICKERSON, PURSUANT TO ORDER NO. 96-054 (NPDES NO. CAS614001)

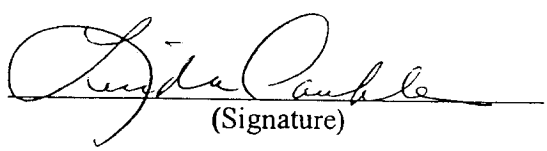
I deposited in a box or other facility regularly maintained by Overnight Express, an express service carrier, or delivered to a courier or driver authorized by said express service carrier to receive documents, a true copy of the foregoing document in sealed envelopes or packages designated by the express service carrier, addressed as stated below, with fees for overnight delivery paid or provided for.

Dennis A. Dickerson
Executive Officer
California Regional Water Quality Control Board
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Executed on February 24, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Linda Cauble
(Type or print name)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May 19, 2000

VIA FACSIMILE AND
FIRST CLASS MAIL

Ms. Parvaneh Khayat
Storm Water Division
State Water Resources Control Board
Los Angeles Region
320 W. 4th St., Suite 200
Los Angeles, California 90013

Re: Administrative Record for Standard Urban Storm Water Mitigation Plan

Dear Ms. Khayat:

You may recall that I recently inspected the Administrative Record pertaining to the Standard Urban Storm Water Mitigation Plan at the Regional Board's office. Our further review of the Administrative Record has revealed it is missing some items. The missing items are in Volume 8, identified as numbers 20 and 59. (A copy of the index is enclosed with the highlighted items.) We would appreciate you sending us copies of the two missing documents as soon as possible given the May 31, 2000 filing deadline set by the State Board.

Thank you for your assistance.

Very truly yours,

RUTAN & TUCKER, LLP

Terence J. Gallagher

TJG:jb
cc: Elizabeth Jennings, Esq.,
State Water Resources Control Board

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Administrative Record: SWRCB/OCC Files A-1280, A-1280(a), A-1280 (b)

VOLUME 08

Doc. No.	Item	Date	Documents
	1	01/13/00	AbTech
	2	12/23/99	AIR LIQUIDE
	3	11/30/99	AKERS Entertainment Marketing
	4	01/24/00	Ann Romano Associates
	5	09/16/99	Apartment Association California Southern Cities, Inc.
	6	12/28/99	ASCE- Los Angeles Section
	7	01/24/00	B & E Engineers
	8	01/25/00	BIA
	9	01/21/00	BIA
	10	01/21/00	BIA SUSMP Proposal with Change Sheet
	11	01/14/00	BIA
	12	01/12/00	BIA
	13	12/23/99	BIA
	14	12/13/99	BIA
	15	09/15/99	BIA
	16	09/08/99	BIA
	17	09/09/99	Brash Industries
	18	01/25/00	California Apartment Association, California Building Industry Association, California Business Property Association, California Chamber of Commerce, California Manufacturers Association, California Restaurant Association
	19	01/14/00	California Restaurant Association
	20	01/25/00	Cabrillo Economic Development Corporation
	21	01/14/00	California Environmental Associates
	22	12/16/99	California Environmental Associates
	23	12/15/99	California Public Interest Research Group
	24	01/05/00	CDS TECHNOLOGIES, INC.
	25	09/15/99	Centex Homes
	26	09/15/99	Centex Homes
	27	01/20/00	Citation Homes
	28	01/25/00	Daly & Associates
	29	01/24/00	Del Webb's Sun City Palm Desert
	30	09/13/99	Desert Partners, Inc.
	31	01/24/00	DeVere Anderson Enterprises
	32	01/19/00	Executive Advisory Committee Version of SUSMP
	33	12/22/99	Executive Advisory Committee
	34	12/16/99	Executive Advisory Committee
	35	08/31/99	Executive Advisory Committee Letter with Final Tentative SUSMP (12/07/99)
	36	09/14/99	Engineering Contractors: Association
	37	01/24/00	First American Title Company
	38	09/14/99	FORMA
	39	01/26/00	Greystone Homes
	40	09/15/99	Greystone Homes
	41	09/15/99	Greystone Homes

	42	10/22/99	H, O& K Inc.
	43	01/24/00	Harvey Stienberg, AICP
	44	01/15/00	John L. Hunter and Associates, Inc.
	45	01/10/00	Cruz/Krovetz: IDEAS
	46	01/05/00	JBI Process Equipment
	47	01/25/00	JCC Homes
	48	09/15/99	JTL Development Corporation
	49	01/25/00	Justice & Associates
	50	01/2400	Kaufman Broad
	51	01/20/00	John Laing Homes
	52	09/15/99	John Laing Homes
	53	09/13/99	John Laing Homes
	54	01/24/00	LANTEX
	55	09/15/99	Land Tech Engineers
	56	01/18/00	Legacy Partners
	57	01/24/00	Lennar Communities
	58	12/06/99	Liberty Hill Foundation
	59	10/14/99	Long Beach Area Chamber of Commerce
	60	01/20/00	Los Angeles County Board of REALESTATE
	61	01/18/00	Malibu Bay Company
	62	01/21/00	MIA LEHRER & Associates, Landscape Architecture
	63	09/13/99	Mid-Cities Escrow
	64	01/14/00	New Hall Land
	65	12/13/99	New Hall Land
	66	09/08/99	New Hall Land
	67	09/16/99	New Urban West, Inc.
	68	09/14/99	Pace Engineering, Inc.
	69	01/24/00	Pacific Bay Homes
	70	09/14/99	Pacific Bay Homes
	71	09/14/99	Pacific Bay Homes
	72	01/24/00	Pacific Soils Engineering, Inc.
	73	09/15/99	Pacific Soils Engineering, Inc.
	74	09/15/99	Pacific Soils Engineering, Inc.
	75	01/20/00	Pardee Construction Company
	76	01/21/00	Playa Vista
	77	09/14/99	David B. Placek, P.E.
	7 ?	09/14/99	Ramseyer and Associates, Inc.
	78	09/13/99	James S. Rasmussen
	79		Rex B. Link & Associates
	80	01/24/00	Rottman Froman Communities
	81	12/22/99	Rutan & Tucker
	82	01/25/00	Shea Homes
	83	01/24/00	Shea Homes
	84	09/13/99	Shea Homes
	7 5	09/14/99	SIKAND Engineering, Planning, Surveying
	86	09/13/99	SIKAND Engineering, Planning, Surveying
	87	01/20/00	Southern California Contractors Association, Inc.
	88	01/24/00	Southern California Ready Mixed Concrete Association
	89	09/15/99	Southern California Ready Mixed Concrete Association
	90	09/13/99	South Place Corporation
	91	01/12/00	Stainless Industrial Companies
	92	01/24/00	SunCal Companies
	93	01/21/00	SunCal Companies

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Attorneys for Petitioners

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION
00 MAY -1 PM 1:53

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BELL GARDENS, BURBANK, CERRITOS, COMMERCE, COMPTON, DIAMOND BAR, DOWNEY, HAWAIIAN GARDENS, HUNTINGTON PARK, INDUSTRY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, MONTEBELLO, PALOS VERDES ESTATES, PARAMOUNT, PICO RIVERA, POMONA, RANCHO PALOS VERDES, ROSEMEAD, SAN GABRIEL, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, Petitioners, vs. THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board, Respondents.	Case No. PETITIONERS' SUMMARY OF ARGUMENTS AND REPLY TO OPPOSITIONS FILED BY RESPONDENTS AND BY NRDC, SANTA MONICA BAY KEEPER AND HEAL THE BAY Hearing Date: June 7, 2000 Time: 10:00 a.m. Location: 3350 Civic Center Drive Torrance, CA 90503

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Petitioners herein file this Summary of Argument and Reply to the Opposition filed by Respondents, the Los Angeles Regional Water Quality Board and Dennis Dickerson, its Executive Officer (hereafter "Respondents"), and in reply to the Opposition papers filed collectively by the Natural Resource Defense Council, Inc., the Santa Monica Bay Keeper, and Heal The Bay (hereafter collectively "NRDC").

I. INTRODUCTION.

Respondents and the NRDC have skirted the fundamental deficiency with the Respondents' mandated SUSMP program. Namely, Petitioners have been granted a Permit to discharge to the Municipal Storm Sewer Systems ("MS4s"), and as the Permittees are in compliance with this Permit, they are in compliance with the Clean Water Act and State law. Nothing in the Permit authorizes Respondents to ***mandate*** a SUSMP program on the Permittees. In fact, the opposite is true, that is, the SUSMP program is to be a program submitted by the Permittees and reviewed by the Executive Officer. At worst, is to be a negotiated program through a formal meet and confer process which may include the preparation of a Storm Water Program Compliance Amendment ("SPCA"). Neither the Respondents nor the NRDC have cited any authority to the contrary,[1] and they have been unable to cite to any language which refutes the Petitioners' position in this regard or to support their claims that the Permit need ***not*** be complied with. In short, the Permittees have submitted a SUSMP program which the Respondents have failed to review and approve in accordance with the Permit itself, and the Respondents have breached the Permit by failing to comply with its terms, and with other terms of the Permit concerning the development and application of the SUSMP program.

Interestingly enough, Respondents argue that it is the Permittees that have missed the point as Respondents contend that this is "not an enforcement action in which the Regional Board must show harm or violation," (see, Respondents' Opposition, p. 4, ll. 17-18), and the question "is not

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[1] Interestingly enough the NRDC attempts to mislead the State Board into believing that the SUSMP approved by the Board was proposed and proffered by the Permittees. "Nevertheless the proposal that staff presented was still the Permittees' proposal." (Emphasis in original.) (See, NRDC Opposition Points and Authorities at p. 8, ll. 10-11.) In addition, at page 17 the NRDC continues with its misrepresentation: "Thus it [the Regional Board] was required to adopt its version of the version proffered by the Permittees." (NRDC Opposition, p. 17, l. 8.) These statements by the NRDC are simply false.

whether the Regional Board carried its burden of evidence but rather did it properly execute its legal duties." (Respondents' Opposition, p. 5, ll. 3-4.) Maybe Respondents are correct that the issue is not necessarily whether Respondents met their burden of proof, but rather whether the Respondents' actions have any legal effect on these Petitioners or any other parties, as the Respondents' actions violate the requirements of the Permit. In short, the central questions raised by this Petition are (1) whether the Respondents complied with the terms of their own Permit, and if so, (2) whether their actions are otherwise authorized by State and federal law. The evidence in the record and the evidence to be presented at the time of the hearing will show that the answer to both these questions is a resounding "no."[2]

II. RESPONDENTS' HAVE VIOLATED THE TERMS OF THEIR OWN PERMIT.

The evidence in the Administrative Record ("A.R.") and the express language of the Permit itself show that the Regional Board failed to comply with the requirements of the Permit in the development, review and approval of the SUSMP program. Specifically, Respondents failed to comply with the requirements of Part 2.III.A of the Permit concerning the preparation and application of the SUSMP, and Respondents failed to comply with the Administrative Review Process for the review and approval of the Permittees' SUSMP program in accordance with Part 2.I.G of the Permit. As a result of Respondents' failure to comply with both the development process for the SUSMP program and the Administrative Review Process, the subject Petition must be granted and the actions of the Respondents, in their entirety, must be overturned with the program submitted by the Permittees in August of 1999 being deemed approved in accordance with the terms of the Permit.

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[2] Contrary to Respondents' and NRDC's contentions regarding this Board's standard of review of the Respondents' actions in issuing the SUSMP Program, this Board must exercise its "independent judgment" (Water Code § 13330) to determine that such actions were "appropriate and proper." (Water Code § 13320), not the more deferential standard proposed by such parties. (*See, e.g., Marina County Water Dist. v. State Water Resources Control Bd.* (1984) 163 Cal.App.3d 132, 136-137; *In the Matter of the Petition of Exxon Company, USA* (1985) Order No. WQ 86-16 at p. 14; *In the Matter of Application of 22627 Henwood Associates, Inc.* (1988) Order No. WR 88-19 at pp. 8, 14, *Water Right Application 30298, Diane Stuller* (1997) Order No. WR 9704 at pp. 19-20.

A. Respondents' Action Violated The Administrative Review Process Under The Permit.

At the hearing at the time of the Permit, counsel for the Respondents candidly admitted that the Administrative Review Process applied, and that it was a clean process that should have been followed. According to the Respondents' counsel: "I think it does qualify under the provisions of the Permit Mr. Montevideo has cited." (A.R., Vol. 12, January 26, 2000, Transcript, p. 151 (hereinafter "Transcripts"), lines 3-5.) Regional Board's counsel continues and reaffirms his belief in this regard stating: "It's true, if I had my druthers, I'd rather stick to the process because it's so clean. It fits neatly into the permit requirements." (Transcripts, p. 152, lines 25-27.) Accordingly, Respondents have admitted the Administrative Review Process applies to the review and approval of the subject SUSMP program and that such procedures should have been followed.

In their opposition, Respondents make the unique argument that the Administrative Review Process only applies prior "to initiating enforcement action" against the Petitioners. (See Respondents' Opposition, p. 16.) In effect, Respondents appear to be arguing that they can impose programs that are not approved in accordance with the Administrative Review Process, but simply cannot enforce those program until they have complied with the terms of the process. The argument is nonsensical. Respondents admit that the Administrative Review Process applies to the review of the SUSMP program and further admit that the Administrative Review Process must be complied with prior to "initiating enforcement actions." Thus, in accordance with Respondents' own arguments, the Administrative Review Process applies, should have been complied with, and no enforcement action can be taken until it has complied with. In short, Respondents appear to be making the Petitioners' argument that the action taken by the Regional Board on January 26, 2000, and the subsequent action of its Executive Officer, have no legal force or effect.

Further, Respondents and the NRDC continue to ignore the fact that upon the Regional Board's issuance of the Permit in July of 1996, all of the Respondents' authority under both the Clean Water Act and State law to regulate MS4s in Los Angeles County was limited by Order

No. 96-054. Accordingly, the development, review, and approval of Respondents' mandated SUSMP program, a program developed directly contrary to the process to be followed under the Permit, are actions that were taken in excess of Respondents' authority under both the Clean Water Act and State law.

Next, Respondents make the awkward argument that the Administrative Review Process is a process that is to benefit the "Permittees," (*id.* at p. 17, ll. 10-13) and that such provisions must be considered in their full context including harm to the interests protected and the deadlines set forth in the Permit for implementation, namely, July 30, 1999. The argument is then that because this deadline of July 30, 1999 was not complied with [because of the Regional Board's inaction], that magically the Regional Board was within its right to consider the process to be "obsolete." (*Id.* at p. 17, ll. 15-20.) No citation to the Permit or State or federal law is made, and no explanation is provided as to why the Administrative Review Process suddenly became "obsolete."[3]

Finally, the Regional Board contends that, even if the process was not obsolete, the Respondents' actions did not harm the Petitioners' interest. In making this argument, Respondents overlook the fact that the entire Administrative Review Process has been ignored, that the Regional Board's SUSMP program is not scientifically supported, and that the program was not developed and otherwise applied in accordance with the express terms of the Permit (see discussion below).

The problem with each of the Respondents' arguments in connection with the

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[3] Respondents interestingly and incorrectly argue that the deadline for implementation of the SUSMP program was July 30, 1999, and that Permittees submitted a final SUSMP to the Regional Board on August 10, 1999. Respondents obviously are going out of their way to mislead the State Board on the true facts of the case. As Respondents well know, the SUSMP could not be prepared and submitted until Respondents had approved the Petitioners' BMPs which, unfortunately, did not occur until April of 1999. Moreover, the SUSMP program was in fact submitted on July 21, 1999, prior to July 30, 1999, and was submitted timely in accordance with the Respondents' approval of the Petitioners' BMPs, but was resubmitted in August of 1999 after the Respondents submitted comments to the Petitioners' initial submittal. Further, Respondents and the NRDC's arguments on the deadline of July 30, 1999 are disingenuous as both parties recognized that it is the Respondents who have completely failed to comply with any of the timelines set forth in the subject Permit, as evidenced by the NRDC's petition to the United States Environmental Protection Agency to decertify the Regional Board and withdraw its authority, and the Regional Board's failure to oppose such a Petition at this time. (See Exhibit "5" to Petitioners' summary of evidence.)

Administrative Review Process is that they are not supported by the language of the Permit or the evidence in the record. Specifically, nothing in the Permit provides that the Administrative Review Process will become "obsolete," if the Regional Board or any other party fails to meet a deadline. Nothing in the Permit gives the Respondents the authority to dispense with the meet and confer process under the Administrative Review Process simply because the Regional Board unilaterally dispensed with it. Nothing in the Permit gives the Respondents the authority to completely fail to provide review of the SUSMP program submitted by the Permittees, and to unilaterally devise their own SUSMP program and thereafter force the terms of the program they developed on the Permittees. In fact, Respondents' counsel at the time of the hearing on January 26, 2000, recognized that the whole purpose of the Administrative Review Process was to protect the Permittees from unilateral action of the Board: "I think the reason for the provisions having to do with the administrative review process was to protect the parties, the Permittees, from having to be unilaterally told [what] to do at this stage of the process." (Transcripts, p. 151, l. 26 – p. 152, l. 1.) Respondents have thwarted the entire purpose of the Administrative Review Process.

The Administrative Review Process was put into place for the very purpose of resolving differences in compliance expectations and in programs submitted for review and approval by the Executive Officer. The Administrative Review Process was put into place to require a continuing dialogue between the Permittees and the Executive Officer over the program submitted by the Permittees. The Administrative Review Process was put into place to provide the parties sufficient time to evaluate the programs submitted, and to enable the Permittees time to show the Executive Officer that their program was sufficient, which would then lead to a Notice of Program Sufficiency. The Administrative Review Process was put into place to enable the Executive Officer (if after the meet and confer process he or she believed the proposed program remained deficient), to request the submission of a Storm Water Program Compliance Amendment ("SPCA") and if that amendment was still not acceptable, to provide the Permittees an additional 60 days to remedy any deficiency in the SPCA. The Administrative Review Process was specifically put into place to provide a procedure to resolve differences over a SUSMP program and other programs, i.e., ***a due process*** requirement to be followed to resolve the exact dispute that

has arisen in this case and to avoid a Regional Board mandated program.

The Administrative Review Process was put into place to assure every step in the process was followed by the Regional Board, and to avoid a mandated SUSMP program that was not developed in accordance with the Permit.

Petitioners have been substantially prejudiced by the Regional Board's complete and absolute rejection of the Administrative Review Process required by Order No. 96-054.[4]

B. Respondents Have Failed to Comply With the Permit's Requirements for the Development of the Permittees' SUSMP Program.

In addition to the Respondents' failure to comply with the review process as required by the terms of the Permit, Respondents similarly violated the terms of the Permit by failing to comply with the procedures required for the actual development of the SUSMP program. Specifically, pursuant to Part 2.III.A.1. of the Permit, it is the "Principal Permittee, in consultation with the Permittees" that was to develop the Standard Urban Storm Water Mitigation Plans under subsection (1)(c) of the Development Planning and Construction Section of the Permit. (See Part 2.III.A.1.c.) Nowhere in the development process of the SUSMP program is there a provision that allows the ***Regional Board,*** in consultation with the Permittees, or otherwise, to develop the SUSMP program. Accordingly, Respondents have violated this principal concept of the Permit, by themselves developing the SUSMP program in violation of the terms of the Permit.

Second, the Permit states in no less than ***three (3)*** different locations that the Development Planning Programs, specifically including the SUSMP programs, are to apply only to ***"development projects requiring discretionary approval."*** (See Part 2.III.A.1.; Part 2.III.A.3.;

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[4] The NRDC's position on the application of the Administrative Review Process is no more credible than the Respondents. NRDC contends that the Regional Board substantially complied with the process. Clearly, no compliance is not substantial compliance. The NRDC next argues that the proposal that staff presented to the Regional Board was "still the Permittees' proposal." This contention is a false statement and there is no evidence anywhere in the record that the SUSMP program mandated on the Permittees is "the Permittees' proposal." (See NRDC Opposition, p. 8, ll. 10-11.) Finally, the NRDC argues that no one could expect the Regional Board to have intended strict adherence to the process set forth in the Permit as this would elevate form over substance. Not only has there not been strict compliance, there has been **no adherence to the procedures set forth in the Permit,** and the only elevation that has occurred in this case, is the elevation of the Regional Board's SUSMP program (that has never been agreed to by the Permittees) over the Permittees' rights to due process of law.

and Part 2.III.A.4.) Yet, in spite of the clear terms of the Permit and the application of SUSMP programs only to ***"discretionary"*** development projects, Respondents chose to ignore the Permit and to require the application of the SUSMP programs to "non-discretionary" as well as "discretionary" development projects.

Third, the SUSMP program, again pursuant to the terms of the Permit, was only to apply to ***"development categories"*** and specifically the development categories set forth under Part 2.III.A.1.c. The Respondents' requirement that the SUSMP program also apply to all "environmentally sensitive areas" is a direct violation of the terms of the Permit because "environmentally sensitive areas" are plainly not ***"development categories."*** In fact, the terms of the Permit itself recognize that the "model documented system," such as a checklist to be developed by the Permittees, is to consider the location of projects with respect to designated "environmentally sensitive areas," as well as the slope and erosion potential of the site and surrounding areas. Thus, "environmentally sensitive areas," according to the Permit, are to be considered in the course of the "model documented system," as is the erosion potential of the site, but not as a "development category" for purposes of the SUSMP.

The SUSMP program is only to be applied to "development categories" and nothing in the Permit allows for or requires the Permittees to apply SUSMP programs to generic locations within the County that are not "development categories." Respondents' application of the SUSMP program to environmentally sensitive areas, as well as the unsupported expansion of the seven development categories to include parking lots in excess of 5,000 square feet, represent clear violations of the Permit.

In addition, Respondents have violated the terms of the Permit with the development of their mandated SUSMP program by prohibiting post-development peak storm water runoff discharges that exceed estimated pre-development rates, where the increased peak storm water discharge rate will result in increased potential for downstream erosion. (See Regional Board SUSMP, p. 6, § 1.) This contradicts the terms of the Permit itself, specifically Part 2.III.A.1.b., which provides that:

> For developments where increased storm water discharge rates will result in an increase in downstream erosion potential, the list of recommended

BMPs shall include those BMPs which can be used to maintain peak runoff rates at pre-development levels ***to the maximum extent feasible.***

Accordingly, Respondents have violated the terms of the Permit by deleting the standard in the Permit by which development may result in downstream erosion potential, i.e. by deleting the standard to reduce these levels "to the maximum extent feasible."

In short, Respondents have ignored a number of significant elements of the Development Planning Procedures to be followed in developing a SUSMP program, and they have further changed the requirements and the scope and application of SUSMP programs so as to apply it to developments and projects not permitted or called for anywhere in the Permit.

Respondents have thus not only violated the approval process required for the review and approval of the Permittees' SUSMP program, they have, moreover, fundamentally violated the substantive requirements to be followed in developing the SUSMP program.

III. RESPONDENTS HAVE NO AUTHORITY UNDER STATE AND FEDERAL LAW TO MANDATE THEIR OWN SUSMP PROGRAM ON THE PERMITTEES.

When the Los Angeles Regional Board issued Order No. 96-054 in July of 1996, that Board exercised its discretion and set forth the requirements by which the Permittees were permitted to discharge pollutants into their MS4s, and the requirements to "reduce the discharge of pollutants to the maximum extent practicable." (See 33 U.S.C. § 1342(p)(3)(b).) With the issuance of said Permit, Permittees are authorized by state and federal law to allow discharges of storm water and non-storm water, in accordance with the Permit, into their MS4s. Neither Respondents nor the NRDC cite any authority in their voluminous opposition papers that provides authority to the Regional Board to, in midstream, impose ***new*** mandates and requirements on the Permittees ***in excess*** of the conditions and requirements set forth in the existing Permit.

Neither the Clean Water Act nor the Porter-Cologne Act authorize the Respondents to violate the terms of an NPDES Permit and to proceed outside of its requirements. In short, the Respondents have cited no authority under any state or federal law that justifies their bad faith breach of the terms of the Permit issued in July of 1996. Not only are the Respondents actions in direct violation of the terms of the Permit and thus the Clean Water Act, in addition, because there

is no authority for their actions, they are void *ab initio* and constitute meaningless actions having no legal force or effect.

IV. RESPONDENTS' PROPOSED SUSMP PROGRAM HAS NOT BEEN SHOWN TO BE COST EFFECTIVE AS REQUIRED BY THE TERMS OF THE PERMIT ITSELF AND STATE AND FEDERAL LAW.

Respondents argue that "economic analysis is not required when implementing a federal regulation" without any citation for the same, and without recognizing that the SUSMP program was to be adopted in accordance with the terms of the Permit and State and federal law, all of which require a review of the ***cost effectiveness*** of the proposed program.

The terms of the Permit itself clearly provide the Permittees with the discretion to consider the ***cost effectiveness*** of their programs in developing BMPs, which are then used in the development of the SUSMP program. Specifically, subsection (b) of Part III.A.1. on page 34 of the Permit provides that: ***"Cost effectiveness, ease of maintenance, and consistency with other environmental mandates may also be considered."*** Accordingly, the terms of the Permit itself make it very clear that "cost effectiveness" may, at the discretion of the ***Permittees***, be considered. The Permittees, throughout this process, have informed the Respondents that the cost effectiveness of the proposed BMPs is essential for a successful program. Similarly, subsection (c) of Part 2.III.4. of the Permit ***requires*** the Permittees to develop model programs to inform developers seeking "discretionary approvals" of "cost effective storm water pollution control measures." Accordingly, under the Permit, the cost effectiveness of the proposed programs must be considered in developing SUSMP programs.

State and federal law support the requirement of "cost effectiveness," as the regulations to the Clean Water Act require the "maximum extent practicable" standard to be applied "in a site-specific, flexible manner, taking into account cost considerations as well as water quality effects." (See 64 F.R. 68722, 68732.) In addition, California Water Code §§ 13165, 13225(c), and 13241 all require that before the Respondents can mandate a program similar to the SUSMP program mandated on the Permittees, such requirements are to be shown to be cost effective, with the cost bearing a reasonable relationship to the need for the program, and with the benefits of the program

outweighing the costs.

In response to these requirements for consideration of costs and a cost/benefit analysis, Respondents claim that they have in fact submitted evidence of a cost effective program, and that as such the record supports their mandating of the proposed SUSMP program on the Permittees. The evidence in the record, however, shows the contrary. First, there is no evidence in the record to show that the Respondents have performed the necessary analysis to identify the "pollutants of concern" and to identify the "sources of pollutants" in developing their SUSMP program. To the contrary, Respondents have attempted to impose a "one size fits all" program that would require the same structural/treatment BMPs to be utilized in the development of a low or moderate income housing development, in comparison to the development of a large refinery. Specifically, the same numerical mitigation standard of .75 inches of rain over a 24 hour period, must be complied with, without any recognition of the pollutants of concern from the low income housing project and the cost per unit to comply with this standard, or the benefits to be obtained therefrom. The result of the Regional Board's SUSMP program is a SUSMP program that has failed to consider the pollutants of concern, the sources of these pollutants, the cost to address the pollutants for any particular development projects, and the benefits to be obtained therefrom.

Respondents and the NRDC claim that in fact the Regional Board did present some evidence of the cost to develop and maintain a retention basin for a five acre commercial development project. Unfortunately, the costs presented show on their face that the Regional Board's numbers were deficient and bear no relationship to reality. Specifically, the Regional Board estimated that the cost to maintain a detention basin for a five acre commercial development project would equal a whopping "$33.00" per year, and that the total cost of the detention basin, as they relate to the project costs, would equate to .6%. Clearly, the maintenance costs of $33.00 per year for a detention basin for a five acre commercial development is not credible regardless of the size of the detention basin. Further, in their example, the Regional Board failed to provide any specifics as to the size of the detention basin, the quantity of water to be retained in the detention basin, and the amount of land needed for the basin.

In addition, the Regional Board's costs did not include any fencing or security costs for the

detention basin, additional liability insurance required for the maintenance of the detention basin, and the additional cost to dispose of the water from the detention basin and/or to dispose of any potentially "hazardous waste" that may arise from the accumulation of all of the unidentified pollutants in the detention basin. Nor did the Regional Board's example identify what pollutants of concern were to be addressed by its detention basin, and whether its detention basin would be effective in addressing such pollutants of concern, i.e. whether the proposed purposes and benefits of the detention basin outweighed its cost. In short, the Respondents' costs analysis contains no cost/benefit analysis and the costs actually identified were understated.

V. RESPONDENTS HAVE FAILED TO COMPLY WITH THE REQUIREMENTS OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT.

The California Environmental Quality Act requires the consideration of all potentially significant environmental impacts resulting from the proposed project to be imposed on the Permittees by the Respondents. Respondents argue that California Water Code Section 13389 exempts their mandated SUSMP program from the requirements of CEQA. The plain language of Section 13389, however, shows that it only applies to the "adoption" of waste discharge requirements. (See Cal. Water Code § 13389.) Here, the waste discharge requirements in question were "adopted" in July of 1996, and the SUSMP program in issue is not an adopted waste discharge requirement, but instead a storm water mitigation program to be developed by the Permittees, and reviewed by the Regional Board, with the purpose of reducing the discharge of pollutants to the maximum extent practicable. As the approval of the SUSMP program was not noticed as, and was not the "adoption" of, waste discharge requirements, California Water Code Section 13389 has no application.

Furthermore, the terms of the Permit itself expressly give the discretion to the ***Permittees*** to consider ***"other environmental mandates"*** in their consideration of the best management practices to be then incorporated into their SUSMP program. (See Permit, Part 2.III.1.b.)

In addition, for the Respondents and the NRDC to simply ignore the need to comply, if not with the letter of CEQA, then the spirit of CEQA, is a hypocritical position for these so-called environmental protection organizations to assume. Sound public policy dictates the consideration

of all potentially significant environmental impacts from the approval of the SUSMP program in issue, before rendering the decision (which in this case particularly includes consideration of the impact of this decision on available low and moderate income housing, the disparate environmental and economic impacts on economically disadvantaged communities throughout the County, the creation of attractive nuisances, the mosquito and rat control problems created by the mandated SUSMP program, problems created from the generation and disposal of the storm water runoff, the generation and disposal of solid and/or hazardous waste from the detention basins, and the general impact created by the development of infiltration basin/ponds, wet ponds, grassy swales and extended detention basins throughout the County, specifically including the potential significant adverse impacts on groundwater quality).

VI. RESPONDENTS' ACTIONS WILL RESULT IN THE IMPOSITION OF UNFUNDED MANDATES IN VIOLATION OF THE CALIFORNIA CONSTITUTION.

Respondents argue that Article 13 B Section 6 of the California Constitution does not apply to the mandated SUSMP program as it only applies to additional levels of "service" on local governments and not "regulatory requirements" imposed on the Permittees. The argument, however, falls on its face as the Regional Board's mandated SUSMP program is clearly not a "regulatory requirement" imposed by any state or federal law on the Permittees. Rather, it is a program that is being mandated by the Regional Board in its "discretion."

Specifically, Respondents have consistently claimed that they have the "discretion" to mandate the numerical mitigation standard, relying upon the Ninth Circuit decision of *Defenders of Wildlife v. Browner* (1999) 191 F.3d 1159. Respondents, in fact, have to make the argument that they have the "discretion" to impose their requirements since nothing in state or federal law ***requires*** the numerical mitigation standard or any of the other specific provisions of the SUSMP program to be mandated by the Respondents. In short, Respondents must make the argument that they have the "discretion" to impose the SUSMP requirements ***specifically because*** the SUSMP requirements are not "regulatory requirements" under either state or federal law. If these requirements had been "regulatory requirements" under state or federal law, Respondents would

not need to argue they have the "discretion" to impose the requirements, but could simply argue they were required to impose the requirements.

For this same reason, the exemption to the prohibition on imposing unfunded mandates under Government Code § 17556(c) does not apply, as Respondents are not requiring the implementation of a federal mandate as such a mandate only applies where the State has ***"no true choice"*** in the manner of implementing a federal program. (*Hayes v. Commission on State Mandates* (1992) 11 Cal.App.4th 1564, 1593.) As discussed in *Defenders of Wildlife v. Browner, supra*, 191 F.3d 1159, according to the Respondents, not only do they have a "true choice," they in fact have the "discretion" to mandate the SUSMP program.

Finally, Respondents rely upon Government Code § 17556(d) to argue there is an exemption from the prohibition on imposing "unfunded mandates" where the local agency "has the authority to levy service charges, fees or assessments sufficient to pay for the mandated program or increase level of service." (Respondents' Opposition, p. 36, ll. 22-25.) Under the prohibitions and requirements of Proposition 218 adopted by the voters of California in 1996, as well as Propositions 13 and 62, the Permittees in fact do not "have the authority" to impose fees to pay for the cost of carrying out the Regional Board's mandated SUSMP program.

VII. RESPONDENTS' ACTIONS EQUATE TO THE ADOPTION OF INVALID REGULATIONS IN VIOLATION OF THE CALIFORNIA ADMINISTRATIVE PROCEDURES ACT.

Respondents argue, without citation or any authority of any kind, that their actions are not "rule making" in nature. In effect, Respondents argue that their actions are not "rule making" because they say they are not "rule making." The requirements of the California Administrative Procedures Act, however, and a review of the evidence in the record shows quite the opposite, and the Respondents have failed to comply with the requirements of the Administrative Procedures Act ("APA").

Specifically, although the APA does not apply to the issuance or amendment of permits, including waste discharge requirements, if the action in question rises to the level of an "order," a "regulation" or a "standard of general application," the APA clearly applies. (Gov. Code

§ 11342(g).) In the instant case, the SUSMP program is a one size fits all program that is being imposed on all cities throughout the County of Los Angeles, including the County itself, and is being applied to all discretionary and non-discretionary projects that fall within a very broad description of "development categories," including a large undefined area known as "environmentally sensitive areas."

In addition, on May 25, 2000, Respondent Regional Board specifically determined to refrain from issuing a new NPDES MS4 permit for Ventura County until a showing could be made as to why the general standard that was being imposed on the Los Angeles County Permittees should not also be applied in Ventura County. Clearly, the Regional Board's action has risen to the level of a "standard of general application" that is being mandated on cities throughout all of Los Angeles County, and now apparently Ventura County.

Moreover, Respondents attempt to force the Permittees to regulate the contractual terms of private purchase/sale agreements for real property, and to regulate the specific language of conditions, covenants and restrictions ("CC&R's") of homeowner's associations, is nothing short of legislation by the Regional Board.

VIII. RESPONDENTS' ACTIONS VIOLATE CALIFORNIA WATER CODE § 13360.

Respondents argue that their mandated SUSMP program is not governed by Water Code Section 13360(a), claiming that their standards have "broad technical reach . . . and are not unique to any singular approach." Respondents further argue that their standards are "minimum standards and Petitioners can use stricter criteria." (Respondents' Opposition, p. 35, ll. 12-17.) A review of the mandated SUSMP program itself, however, shows the opposite. Specifically, the numerical design standard in question identified in Section 9, entitled "Design Standards for Structural or Treatment Controlled BMPs," may provide four different options for purposes of mitigating/infiltrating or treating storm water runoff, but only with respect to options on ***calculating*** the quantity of runoff to mitigate or treat. That is, the design standard gives the Permittees four different ways in which to ***calculate*** the amount of runoff that is to be treated, but still requires structural or controlled BMPs to be designed on a project-by-project basis, for both discretionary and non-discretionary projects, for runoff equating to a storm event of .75 inches of

rain over a 24 hour period.

In short, there is absolutely no flexibility for the Permittees to modify the need for the structural/treatment BMP given the use in issue, the designated pollutants of concern, or the ability of the Permittees to capture the runoff and address the pollutants of concern through a regional collection system. Rather, each project is required to include structural/treatment BMPs to address .75 inches of rain over a 24 hour period. Respondents have imposed a design standard that is prohibited by California Water Code Section 13360(a).

Interestingly enough, the NRDC argues that, on the one hand, for purposes of Section 13360 the SUSMP is "totally independent of any design standard" (NRDC Opposition, p. 21, ll. 9-11), but on the other hand, for purposes of CEQA, argues that the SUSMP is a part of a waste discharge requirement and therefore is covered by the exemption under 13389. (NRDC Opposition, p. 24, l. 16 – p. 25, l. 4.) Obviously, the NRDC is willing to make whatever argument it believes sounds reasonable, without regard to consistency in its position. Water Code Section 13360(a) applies to not only waste discharge requirements but also to other orders by the Regional Board which specify the "design, location, type of construction, or ***particular manner*** in which compliance may be had with that requirement, order or decree. . . ." (See Cal. Water Code § 13360(a).) The Regional Board's actions violate Water Code Section 13360(a).

IX. RESPONDENTS' ACTIONS HAVE DEPRIVED PETITIONERS OF THEIR PROCEDURAL AND SUBSTANTIVE RIGHTS TO DUE PROCESS OF LAW.

Respondents argue that they provided adequate due process of law to Petitioners because Respondents held workshops in August and September, and because they circulated a tentative draft of the SUSMP on December 8, 1999. Respondents thereafter argue that they provided adequate due process of law because they complied "with the federal procedural requirements for *adopting* NPDES permits under Section 124 of Title 40, Code of Federal Regulations and with Water Code § 13377." (Respondents' Opposition, p. 23, ll. 20-23.)

Respondents have missed the sum and substance of Petitioners' argument. Specifically, at no time prior to the hearing of January 26, 2000, did the Regional Board ever notify the Petitioners either in a workshop or in any written notice or draft SUSMP program, that the Regional Board

intended to apply the SUSMP program to "non-discretionary" development projects. In fact, such an application is directly contrary to the express terms of the Permit. Yet, after the close of the public testimony, the Regional Board itself, in the course of its deliberations, decided to apply their SUSMP program to all "non-discretionary" projects that fall within the nine categories specified by the Regional Board. This lack of notice did not comply with any notice provision under state or federal law. Petitioners were not given sufficient notice and an opportunity to be heard on this issue, to present their argument that the Permit only allows the application of SUSMP programs to "discretionary" projects.

Similarly, with respect to the roof top exemption, at the time of the hearing, the Respondent Executive Officer, even after all the testimony was presented, stated he simply did not believe there was any factual basis or that he had enough data to include roof top water within the application of the SUSMP program. Clearly, with the Executive Officer, the party charged with the responsibility for approving the SUSMP program, admitting that even he did not have sufficient information to include roof top water within the program, the Regional Board's adoption of the SUSMP program violated the Petitioners' rights to due process of law.

In addition, Petitioners were denied their rights to basic due process of law as the Permit specifically provides for the discretion to the ***Executive Officer*** to issue the SUSMP program, ***not the Regional Board***. The Regional Board's "direction" to the Executive Officer, who was then compelled to follow that direction, given his position on the lack of data to include roof top water, is a direct violation of the procedural requirements of the Permit, and a violation of Petitioners' rights to due process of law. Further, the last minute submittal of the change sheet of January 25, 2000, which was not given to the Petitioners until the date of the hearing, was clearly insufficient notice and an opportunity to be heard on the items set forth in the change sheet.

Finally, and most importantly, Petitioners were denied their right to due process of law as their express rights as set forth in the Administrative Review Process were completely ignored by the Respondents.

In sum, Petitioners were not provided sufficient notice and a full opportunity to be heard, and they were not provided their substantive rights as provided for in the terms of the Permit itself.

CONCLUSION.

For the foregoing reasons, Petitioners respectfully request that Respondents be required to comply with the terms of Order No. 96-054 and State and federal law, and that the actions of the Regional Board on January 26, 2000 and the Executive Officer, pursuant to his order of March 8, 2000, be overturned with direction to Respondents to comply with the terms of the Permit and applicable law.

Dated: May 30, 2000

Respectfully submitted

RUTAN & TUCKER LLP
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By: _____
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PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over the age of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fourteenth Floor, Costa Mesa, California 92626-1998.

On May 30, 2000, I served on interested parties in said action the within:

PETITIONERS' SUMMARY OF ARGUMENTS AND REPLY TO OPPOSITIONS FILED BY RESPONDENTS AND NRDC, SANTA MONICA BAY KEEPER AND HEAL THE BAY

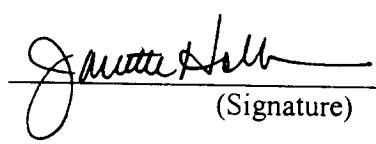
by placing a true copy thereof in sealed envelope(s) addressed as stated on the attached mailing list.

I am readily familiar with this firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. postal service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

Executed on May 30, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Janette Hollmer
(Type or print name)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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BELL GARDENS, BURBANK, CERRITOS, COMMERCE, COMPTON, DIAMOND BAR, DOWNEY, HAWAIIAN GARDENS, HUNTINGTON PARK, INDUSTRY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, MONTEBELLO, PALOS VERDES ESTATES, PARAMOUNT, PICO RIVERA, POMONA, RANCHO PALOS VERDES, ROSEMEAD, SAN GABRIEL, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation,

Petitioners,

vs.

THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board,

Respondents.

Case Nos. A-1280, A-1280(a), and A-1280(b)

PETITIONERS' POST-HEARING REPLY BRIEF TO JUNE 12, 2000 STATE BOARD INQUIRY

Hearing
Date: June 7-8, 2000
Time: 10:00 a.m.
Location: 3350 Civic Center Drive
Torrance, CA 90503

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I. IF THERE IS TO BE A NUMERIC DESIGN STANDARD FOR INFILTRATION OR TREATMENT, IS THE .75-INCH STANDARD APPROPRIATE? SHOULD IT BE SUBSTITUTED WITH A DIFFERENT NUMERIC DESIGN STANDARD INCLUDING POTENTIALLY DIFFERENT NUMBERS FOR DIFFERENT AREAS? IF THERE WERE A RANGE OF NUMBERS HOW WOULD THAT BE IMPLEMENTED?

Although a numeric design standard(s) for infiltration or treatment ***may*** be appropriate for certain developments, the .75-inch standard is not the appropriate standard. The .75" standard was not developed in accordance with the requirements of the Permit or the Clean Water Act ("Act"), nor was it based on an analysis of the pollutants of concern and the sources of those pollutants. Further, the .75" was designed without considering its impact on affordable housing, ground water quality, or single family homeowners. Rather, the evidence shows the .75" standard was extracted from the County's settlement with the NRDC, and was thereafter applied in haste, as broadly as possible, without compliance with the requirements of the Permit and State and Federal law.

Evidence of this cavalier "we must do something" approach is Respondents' last minute expansion of the SUSMP program to "non-discretionary" projects, without considering the import of this action, and without providing sufficient opportunity for Petitioners to be heard on the issue. Further evidence the SUSMP was developed cavalierly and in haste is the inclusion of admittedly overly broad and unwieldy definitions which go to the heart of the SUSMP, i.e., the definitions of "new development" and "redevelopment," and Respondents' improper application of the SUSMP to "environmentally sensitive areas," as well as their failure to give due consideration to the impact of their SUSMP on homeowners. The evidence shows the .75" standard was developed with no more scrutiny, study or deliberateness than were the other facially flawed terms of the SUSMP.

By law, the SUSMP program should have been developed pursuant to the process set forth under the express terms of the Los Angeles County NPDES Permit, Order No. 96-054. The Permit itself was developed under the auspices of the Act and the regulations thereunder. The regulations specifically envision developing a "management program" under an application process that requires the development of "quantitative data," and the development of particular information on "source identification" and "source characterization." (40 CFR 122.26(d)(1) and (2).) Accordingly, "management programs" developed under the Act are to be designed to address

pollutants of concern and their sources through "quantitative data." (Id.)

As emphasized at the hearing, Respondents failed to follow a process which would lead to a program based on the identity of pollutants and the sources of those pollutants. This process, which is effectively required under the Act and incorporated into the Permit through the provisions concerning the development of programs, was not followed either in form or in substance. Nor was Respondents' SUSMP, specifically including its .75 standard, developed in accordance with the ***Administrative Review Process*** under the Permit, i.e. the express procedural requirements of the Permit ***designed to ensure that a fair, deliberate and collaborative process*** was followed. The Administrative Process required to be followed by the Permit, i.e. the express due process to be provided to the Permittees (Permit, p. 21, § I.G.1),[1] was ignored by Respondents, and the result was a one size fits all standard that was not based on sound science.

Finally, none of the state programs Respondents relied upon to support their own program, i.e. Florida, Maryland, and Washington, when scrutinized in any detail, is applied as broadly or haphazardly as Respondents'. For example, **Maryland's** program includes three major "waiver categories," including developments that result in "***less than a ten percent increase in the pre-development 2-year storm event***" as well as those "***projects completely surrounded by an existing storm water drain system of sufficient capacity to convey the increase in discharge caused by the new development.***" In fact, according to the responses provided by Maryland, "***most redevelopment is waived under Maryland's original and current and storm water regulations.***"

Similarly, **Washington's** 1999 draft Storm Water Manual distinguishes non-pollution generating surfaces from pollution generating surfaces and exempts certain surfaces such as "residential roofs, commercial roofs that do not accumulate pollutants from vents and fugitive emissions . . . ." The Manual further allows ***local governments*** to exempt redevelopment projects if they have adopted a plan that fulfills those requirements through ***"regional facilities."***

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[1] At the hearing, Respondents' counsel argued that since the Permit was created by the Regional Board, the Board has the ability to change it including changing the Administrative Review Process. (See Transcripts of June 8th hearing , p. 52, ll. 3-11.) Clearly, the Respondents had not proposed any language changes to the terms of the Permit and never noticed a public hearing or otherwise noticed a meeting on proposed changes. Respondents cannot now be permitted to change the Permit *de facto* by an after-the-fact argument to justify their failure to follow its terms.

Last, the **Florida** program recognizes that under the Act, water pollution control programs can be either water-quality effluent based or technology based. According to Florida, ***every*** storm water treatment program is technology based and requires the conducting of an analysis, including rainfall characteristics, runoff characteristics (i.e. storm water volume, pollutant loadings, drainage area), and BMP effectiveness. (See 5/31/00 FDEP letter, p.2, Item 2.) In addition, Florida recognizes that "***[r]egional stormwater systems, which manage the stormwater from several developments or an entire drainage basin, offer many advantages over the piecemeal approach that relies upon small, individual onsite systems.***" (See FLA. BMPs § 2.2. F.)

In light of: (1) the lack of analysis conducted by Respondents in comparison to the extensive analysis conducted in other states; (2) the numerous facial deficiencies and ambiguities in Respondents' program; (3) the import of this program on the millions of citizens and visitors to the County; and (4) the significant financial and environmental costs involved in implementing such a program, as well as the impracticability of reversing direction in midstream once a program is in place, Petitioners respectfully request that any numeric criteria to be developed be scrutinized by a Statewide Stormwater Quality Technical Advisory Committee ("TAC"), to be charged with following a deliberate and collaborative process on the appropriateness of numeric criteria, and, if appropriate, the development of such criteria for Los Angeles County.

The TAC should consist of representatives of the State Board, the Regional Boards of Los Angeles and San Diego, representatives of the Counties of Los Angeles, Ventura and San Diego, as well as the Southern California Association of Governments ("SCAG"), and City Planners, Public Works Directors, the Building Industry, and environmental organizations, WSPA and other interested stakeholders. Petitioners suggest that a Chair with significant experience in storm water quality issues, be appointed to preside over the TAC, such as Mr. Douglas Harrison, Director of the Fresno County Flood Control and Water Conservation District.

To address the State Board's June 12th request for "specific language" to be included in a SUSMP program, as well as the State Board's apparent desire for the Petitioners to put forth specific numeric criteria, Petitioners are proposing that the attached SUSMP program be implemented within 90 days of State Board approval, ***except*** the numerical standards therein,

which are to be studied and utilized as a starting point for peer review by the TAC.[2]

Given the obvious errors in the hastily adopted Regional Board SUSMP, no numerical standards should be imposed until the requisite deliberative process has been adhered to, and a program is developed that is scientifically based and designed to address the storm water quality problems in Los Angeles County. ***Such a program should consider such issues as BMP effectiveness, affordable housing, groundwater quality, vector control issues, and financial constraints on cities and their constituents.*** Petitioners respectfully object to ***any*** numerical criteria, unless and until a collaborative and deliberative process is followed. As Florida has found, the development of a storm water program requires, at a minimum, conducting an analysis of rainfall characteristics, runoff characteristics (i.e. storm water volume, pollutant loadings, drainage area) and BMP effectiveness. Any numeric standard imposed without sufficient analysis could have disastrous consequences for this County and others throughout the State. Accordingly, the imposition of ***any*** numeric design standard(s), including the numeric criteria proposed in the attached, absent a sound scientific basis by the TAC or equivalent entity, is opposed by the Petitioners. The proposed revisions to Respondents' SUSMP are summarized as follows:[3]

(1) The SUSMP has been revised so that any numeric criteria do not apply to Single

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[2] As referenced in the Petition, because the Regional Board is not a state agency with state-wide jurisdiction, it and other ***Regional Boards*** do not have the authority to impose a SUSMP program or to administer the NPDES program within their jurisdictions, ***without*** appropriate and sufficient direction from the State Board. (See 40 CFR 123.1(g)(1), and 123.22(b).) Only State agencies with "statewide jurisdiction over a class of activities or discharges" are authorized to administer NPDES programs. (Id.) The lack of State direction to individual Regions has resulted in the present problem of different Regional Boards developing varying standards without statewide direction. In developing a "standard of general application," the State Board is required to comply with the rule-making requirements of the APA, Govt. Code § 11340 et seq. As support for the fact that the Respondents have adopted "regulations," Petitioners offer that at the time of the hearing on June 8, Chairman Nahai admitted that ***"After all of that consideration and all of the deliberations, we adopted a set of regulations."*** (June 8th Transcripts, p. 64, ll. 25-26.)

Govt. Code § 11340.5(a) requires the State Board to formally establish it objectives, guidelines and requirements through formal rule making. The APA expressly prohibits public agencies from issuing, utilizing and enforcing any ***order, rule***, or ***standard of general application***, unless such has been adopted as a formal regulation. (See Union of American Physicians & Dentists v. Kizer (1990) 223 Cal.App.3d 490, 496.) Clearly, Regional Boards throughout the State will be basing their direction to cities on the State Board's action on this Petition. Any action imposing specific numeric criteria by this State Board will, therefore, be equivalent to establishing state policy, and the requirements of the APA must be complied with.

[3] The attached SUSMP is the Regional Board's final March 8, 2000 SUSMP program with redlined changes to address the numerous deficiencies Petitioners contend exist with the program.

Family Residences or Units, Subdivisions of 10-99 Homes, Low or Moderate Income Housing Projects, or Redevelopment of historical buildings, sites or landmarks. Also, the addition of 5,000 sq. ft. parking lots has been limited to commercial standalone lots of 25 or more spaces;

(2) Consistent with the Permit, the SUSMP has been revised to apply only to "Discretionary Projects" and the term "project" in the SUSMP is defined as a "discretionary project." Respondents' definition of Discretionary Project is identical to the definition in the regulations to CEQA, and has therefore not been modified. (See 14 CCR § 15357.)

(3) Respondents' inappropriate adoption of "environmentally sensitive areas" to the Permit's seven designated "development" categories, has been deleted, and the term has been redefined to be consistent with its definition in the Development Planning Program, developed under the Permit, and approved by the Executive Officer on 2/11/99.

(4) The term "New Development" has been revised to mean land disturbing activities "resulting in the creation of at least 5,000 square of additional impervious surfaces" "exposed to rainfall," thereby narrowing its scope from the creation of any "impervious surface." The revision avoids the application of the SUSMP to the porch example discussed at the hearing. The term "Redevelopment" has similarly been redefined.

(5) The Section 1 prohibition on Post-Construction Peak Storm Water Runoff Discharges causing erosion has been revised to be consistent with the Permit to only apply to "the maximum extent feasible."

(6) Section 8 has been revised to eliminate language that requires Permittees to ***legislate*** required language in CC&Rs and in purchase/sale agreements between private parties.

(7) For purposes of review by the TAC, Section 9 dealing with the numeric design standard for BMPs has been revised so that these standards only apply where "new development" or "redevelopment" activity will result in additional storm water runoff, in comparison to pre-project runoff, and only where the additional runoff will not otherwise be captured or treated by proximate or regional BMPs constructed or to be constructed within 3 years. (This is consistent with Maryland's program that applies only if there is a 10 % increase in post development runoff from a two year storm event, and its exemption of projects completely surrounded by a sufficient

system, as well as Washington's program that allows local governments to exempt redevelopment projects, where the requirements are met through regional facilities.)

(8) Section 9 dealing with the design standard for BMPs, has been revised for review by the TAC so that different numeric standards, depending on the type of development, may apply.[4] Petitioners propose that the TAC consider a standard that is based on the volume of runoff produced in the 70th percentile 24-hour storm event for 100,000 Square Feet Commercial Developments, the 60th percentile 24-hour storm event for Automotive Repair Shops, Retail Gasoline Outlets ("RGOs"), and Restaurants, and the 50th percentile 24-hour storm event for Home subdivisions with 100 or more housing units. Section 9 has also been revised to include other formulas to calculate a volume of runoff for control or treatment, including a formula that considers the imperviousness of the project. RGOs are exempted where the RGO otherwise complies with the California Best Management Practice Guides for RGOs;

(9) Section 9 has been revised to only require project applicants to design structural or treatment control BMPs to address post-project runoff, consistent with the standard set forth above, unless and until a Statewide Storm Water Quality Mitigation Fund, similar to the State's Underground Storage Tank Fund for underground storage tank releases, has been created. The State Fund is to reimburse project applicants for their costs in developing BMPs necessary to address pre-project runoff only. Applying the Numerical Design Standard under the SUSMP program only to post-development runoff, unless a State Fund is in place, is again consistent with the Maryland program which exempts development categories that result in a less than 10% increase in the pre-development 2-year storm event, as well as its waiver for projects completely surrounded by a sufficient drainage system.

(10) Section 11 of the SUSMP has been revised to provide a waiver for impracticability where there is a "reasonable" risk of groundwater contamination, and to add a basis for a waiver if there is a reasonable risk to the health and safety of the public as a result of vectors, as well as to

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[4] Respondents' first numeric criteria (§ 9.A.1) is ambiguous and appears to be a misapplication of concepts in the WEF Manual. Respondents further fail to consider the WEF Manual determination that if only 70% of the otherwise maximized storm water capture volume is captured, the decrease in total suspended sediment is insignificant. (WEF Manual, p. 174.)

add a waiver for impracticability on other grounds as established by the applicant.

(11) Section 11 has been revised so that waivers need not be approved by the Regional Board, in part in light of the time constraints created by waiting for Board approval. However, the Executive Officer will have the ability, upon petition, to overturn the granting of a waiver.

(12) The Section 11 Waiver dealing with fees has been revised so that rather than simply have the project applicant pay ***precisely*** the same amount into an account otherwise expended to install an ***impracticable*** BMP, the applicant would instead pay a ***mitigation*** fee, to be applied to the cost (including the administrative costs) of developing an alternative solution, specifically including a regional solution, and to require that the Permittees establish a nexus between the fee imposed on the applicant, the pollutants of concern from such project, and the impact on the proposed alternative system. Further, the Regional Board must, within 12 months, develop a matching fund program to match the funds collected by Permittees, whereby such funds are to be utilized to administer the SUSMP program, including developing regional solutions.

In sum, the SUSMP would require the treatment or capture of runoff only from discretionary New Development or Redevelopment projects (defined as adding 5,000 square feet of impervious surface), where the proposed development will result in an increase in runoff from the project site, as compared to pre-project runoff. Any numeric criteria to be developed by the TAC would not apply to pre-project runoff (consistent with the Maryland Program) until a State Storm Water Quality Fund for urban runoff has been created. The SUSMP would also exempt from any numeric criteria individual Single Family Units, 10-99 Home Subdivisions, Historical buildings, sites and landmarks, and low/moderate income housing. It would, moreover, not apply to environmentally sensitive areas, but allows the impacts of such projects to be addressed in the normal CEQA process and the Development Planning provisions of the Permit.

Petitioners respectfully request that all aspects of the attached SUSMP program be adopted and implemented within 90 days, ***except*** the specific numeric design standards, as no such standards should be adopted and implemented unless and until they can be analyzed, reviewed and are implementable, as determined by the TAC.

II. WHAT TYPES OF DEVELOPMENT OR REMODELING PROJECTS SHOULD BE INCLUDED WITHIN THE MITIGATION REQUIREMENTS?

The development and remodeling projects to be included within the SUSMP as identified above and in the attached, should be limited to those "discretionary" projects that result in a net increase in impervious surface of at least 5,000 square feet. This 5,000 square foot restriction should be incorporated into the definitions of "New Development" and "Redevelopment." In addition, any numerical criteria should not apply to individual Single Family units, 10-99 Home Subdivisions, Low and Moderate Income Housing Projects, or to the development of historical buildings, sites or landmarks, as well as RGOs that implement applicable Task Force BMPs.

III. SHOULD LOCATION, SUCH AS ENVIRONMENTALLY SENSITIVE AREAS, BE A FACTOR IN DETERMINING THE APPLICATION OF THE SUSMP? IF SO, WHAT SPECIFIC TYPES OF PROJECTS SHOULD BE INCLUDED?

The location of a project in an "environmentally sensitive area" should be a factor in determining whether a project is a "Priority Project" for purposes of the Permit and in the development of conditions of approval for the project. Under the Permit, however, the "location" of a project is not and should not be the basis for triggering the application of a SUSMP. Rather, the location of the Project in an "environmentally sensitive area" should instead be a consideration in developing and approving the project, and should be considered a potential significant environmental impact for purposes of determining compliance with CEQA. Under Section III.A.1.c of the Permit, (p. 34), the Permit specifically provides for the application of SUSMPs to "***development categories***." Nothing in the Permit provides for the application of SUSMPs to areas or locations, and Respondents' action applying the SUSMP in such fashion is contrary to the clear terms of the Permit."[5] In short, where a project is a Priority Project because it falls within an environmental sensitive area and may have a "potentially significant effect on storm water quality," the project itself should be reviewed to consider its potential impact on storm water quality and, if appropriate, modified to mitigate any such impacts. (Permit, p. 33.)

[5] Permittees and Respondents recognized in the approved Development Planning Program devised pursuant to § III.A.1.a of the Permit, that the Permit does not define "environmentally sensitive areas," and therefore proceeded to define the term in Footnote 3 therein. This Program was approved by the Executive Officer on 2/11/99, and this same definition should accordingly be carried through in the SUSMP's definition of "environmental sensitive areas."

IV. SHOULD THE SUSMP BE APPLIED TO BOTH DISCRETIONARY PROJECTS AND MINISTERIAL PROJECTS? HOW SHOULD THE TERM "DISCRETIONARY" BE DEFINED?

The terms of the Permit make it very clear the SUSMP is only to apply to "discretionary" projects. As discussed at the hearing, the Permit specifically limits the application of SUSMPs to ***"development projects requiring discretionary approval."*** Three other provisions in the "Development Planning" Part of the Permit make it crystal clear that SUSMPs are to apply only to "discretionary" projects. (Permit, p.33, 34 & 36, §§ 1, 3, & 4 to § III.A. "Development Planning.")

The fact that the Permit only applies to "discretionary" projects was conceded by Respondents through an e-mail from their counsel, Mr. Leon, to Mr. Swamikannu dated 1/25/00. In this e-mail Mr. Swamikannu asks: "The 1996 permit talks about discretionary projects. Can SUSMPs be applied to non-discretionary projects as well as discretionary or is the Board limited in this instance." Mr. Leon replies: ***"It's my belief that, since the permit says 'discretionary,' we're stuck. It simply does not include non-discretionary activities. To include them in this proposal by the EO is beyond the scope of the Permit authority. It would take an act of the Board to amend the permit to include non-discretionary activities."*** This e-mail (Item 19 of Vol. 2 of the A.R.) confirms Respondents knew the Permit only allowed the application of SUSMPs to "discretionary projects" and that "it ***would take an act of the Board to amend the Permit to include non-discretionary activities."*** Thus, Respondents knew they were "stuck" when applying SUSMPs to "non-discretionary" projects, but chose to ignore the Permit and to adopt a program in direct violation of its terms.[6] Interestingly enough, the definition of "Discretionary Project" in Respondents' SUSMP is verbatim from the CEQA guidelines. (14 CCR § 15357.)

Respondents last minute decision to apply the SUSMP program to all "non-discretionary" projects, without notice to the Permittees, and without consideration of the impact of this decision,

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[6] Mr. Leon's interpretation is confirmed on p. 2 of Respondents' 12/7/99 Tentative Resolution, which was the draft resolution prepared for adoption at the January 26 hearing. Pursuant to Finding 13 therein, the Regional Board was to find: "13. Standard Urban Stormwater Mitigation Plans are required for a ***specified set of discretionary*** priority projects." (See A.R. p. 11-29 of Item 2 of Vol. 2.) Petitioners intended on addressing the 1/25/00 e-mail and Finding 13 through cross-examination at the hearing. Unfortunately sufficient time was not provided to address these and numerous other issues Petitioners intended to address through cross-examination.

is consistent with their over-zealous approach to hastily adopt a SUSMP, irrespective of the substantive or procedural requirements of the Permit. The belated inclusion of "nondiscretionary" projects exemplifies Respondents desire to "just do something" and its refusal to follow the deliberate and collaborative process required by the Permit and the Act, to do something right.

V. CONCLUSION

In conclusion, the Respondents' numeric standard was extracted from the County's settlement with the NRDC, and is the result of insufficient staffing, funding and inadequate study of the pollutants of concern, their sources, and the best means to mitigate such pollutants.[7] Petitioners respectfully pray that the pollutants of concern and the sources be identified, that the effectiveness of the BMPs be assessed, that a cost/benefit analysis be performed to weigh the benefits of any numeric standard(s) versus its costs, and that the environmental costs such as the impact on groundwater quality, vectors, and the impact on low/moderate income housing, be considered, as well as other more effective alternatives such as regional solutions.

Petitioners further respectfully request that any program be established in accordance with the requirements of the APA (Govt. Code § 11340 et seq.), the Constitutional Prohibition on Unfunded Mandates (Cal. Const. Art. XIII B, § 6), CEQA (Pub. Res. Code § 21000 et seq.), the Cost/Benefit requirements of State and federal law, Water Code Section 13360 on specific design standards, as well as the regulations to the Act requiring "source identification" and consideration of "quantitative data." (40 CFR § 122.26(d)(1) & (2).)

Petitioners respectfully request that all aspects of the attached SUSMP, ***except*** the numeric criteria to be referred to the TAC for comprehensive review, be approved.[8]

Dated: July 6, 2000

RUTAN & TUCKER LLP

By: _____
RICHARD MONTEVIDEO

[7] In its Petition to EPA, ***the NRDC*** contends ***its*** petition "demonstrates that the Regional Board inexplicably devotes the least amount of resources to its worst water quality problem: polluted runoff. Because of its legal inadequacy and objective ineffectiveness, EPA must withdraw the State's authority vested in the Regional Board to oversee the Storm Water Program in Los Angeles unless these deficiencies are corrected within ninety days." (Petitioners' Exh. 5, p. 2, ll. 21-26.)

[8] Petitioners hereby incorporate all of the prior arguments set forth in their Petition, their prior briefings and at the hearing, in this post-hearing brief and continue to contest that the Respondents' SUSMP program is invalid for all of the reasons set forth therein.

PETITIONERS' PROPOSED REVISIONS TO RESPONDENTS'

STANDARD URBAN STORM WATER MITIGATION PLAN

FOR LOS ANGELES COUNTY AND CITIES IN LOS ANGELES COUNTY

STANDARD URBAN STORM WATER MITIGATION PLAN

BACKGROUND

The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Los Angeles County Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects. The same requirements are applicable to the City of Long Beach under its separate municipal storm water permit (City of Long Beach MS4 Permit), which was issued on June 30, 1999.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

1. Effectively prohibit non-storm water discharges, and
2. Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable (MEP statutory standard).

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. The Permittees are required to adopt the requirements set herein in their own SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve the project plan as part of the development plan approval process and prior to issuing building and grading permits for the **discretionary** projects covered by the SUSMP requirements.

All ~~projects~~ **Discretionary Projects** that fall into one of seven categories are identified in the Los Angeles County MS4 Permit as requiring SUSMPs. These categories are:

- Single-Family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units

The ~~Regional Board Executive Officer has designated two additional categories~~ **Design Standards for Structural or Treatment Control BMPs as set forth in Section 9 below shall not apply to Single-Family Hillside Residences (or any individual single-family housing unit, including any individual condominium or apartment unit), Home Subdivisions with 10 to 99 Housing Units, Low or**

Moderate Income Housing projects, or projects involving Historical Sites, Buildings or Landmarks. In addition, the following added category is subject to SUSMP requirements for the Los Angeles County MS4 Permit. ~~These categories are:~~;

- ~~Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and~~Parking lots ~~5,000 square feet or more or~~ **Stand alone commercial parking lots** with 25 or more parking spaces ~~and potentially~~ **which are** exposed to ~~storm water runoff~~ **rainfall.**

The City of Long Beach permit requires SUSMP for the following categories only: (i) 10-99 home subdivisions; (ii) 100 or more subdivisions; (iii) 100,000 or more square foot commercial developments; and (iv) Projects located adjacent to or discharging to environmentally sensitive areas. For the remaining five categories, equivalent requirements have been included directly in or are expected to be developed shortly under the City of Long Beach Storm Water Management Plan.

Permittees shall amend codes and promulgate ordinances not later than ~~September 8, 2000~~ **six (6) months after this SUSMP is finally adopted and not otherwise subject to legal challenge**, to give legal effect to the SUSMP requirements. The SUSMP requirements for projects identified herein shall take effect ~~not later than October 8, 2000.~~ **nine (9) months after this SUSMP is finally adopted and not otherwise subject to legal challenge.**

DEFINITIONS

"100,000 Square Foot Commercial Development" means any commercial development that creates at least 100,000 square feet of impermeable area, including parking ~~areas."Automotive~~ **areas.**

"Automotive Repair Shop" means a facility that is categorized in any one of the following Standard Industrial Classification (SIC) codes: 5013, 5014, 5541, 7532-7534, or 7536-7539.

"Best Management Practice (BMP)" means any program, technology, process, siting criteria, operational methods or measures, or engineered systems, which when implemented prevent, control, remove, or reduce pollution.

"Commercial Development" means any development on private land that is not heavy industrial or residential. The category includes, but is not limited to: hospitals, laboratories and other medical facilities, educational institutions, recreational facilities, plant nurseries, multi-apartment buildings, car wash facilities, mini-malls and other business complexes, shopping malls, hotels, office buildings, public warehouses and other light industrial complexes.

"Directly Connected Impervious Area (DCIA)" means the area covered by a building, impermeable pavement, and/ or other impervious surfaces, which drains directly into the storm drain without first flowing across permeable land area (e.g. lawns).

"Discretionary Project" means a project which requires the exercise of judgement or deliberation when the public agency or public body decides to approve or disapprove a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

"Environmentally Sensitive Area" means an area designated ~~as an Area of Special Biological Significance by the State Water Resources Control Board (Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (1994) and amendments) or an area designated as an Area of Ecological Significance by the County of Los Angeles (Los Angeles County Significant Areas Study, Los Angeles County Department of Regional Planning (1976) and amendments) or an area designated as a significant natural area by the California Resources Agency. Refer to Table 3 for a listing.~~ **by the Permittees within their jurisdiction as "environmentally sensitive" utilizing criteria such as, but not limited to, the presence of the following: endangered, threatened, or rare species or their habitats; locally designated species (e.g., heritage trees); locally designated natural communities (e.g., oak forest, coastal habitat, etc.); and wildlife**

dispersal or migration corridors.

"Greater than (>) 9 unit home subdivision" means any subdivision being developed for 10 or more 10 single-family or multi-family dwelling units.

"Hillside" means property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater.

"Infiltration" means the downward entry of water into the surface of the soil.

"New Development" means land disturbing activities ~~;~~ **and** structural development~~, including~~ **(including the** construction or installation of a building or structure~~, creation of~~**), conducted through a Discretionary Project, resulting in the creation of at least 5,000 square feet of additional** impervious surfaces ~~; and land subdivision~~ **exposed to rainfall**.

"Parking Lot" means land area or facility for the temporary parking or storage of motor vehicles used personally, for business or for commerce with a lot size of 5,000 square feet or more, or with 25 or more parking spaces.

"Project" for purposes of this document shall mean a "Discretionary Project" as defined above.

"Redevelopment" means development~~"Redevelopment" means~~, on an already developed site, ~~the creation or addition of~~ **through a Discretionary Project, resulting in** at least 5,000 square feet of **additional** impervious surfaces ~~or the creation or addition of fifty percent or more of impervious surfaces or the making of improvements to fifty percent or more of the existing structure. Redevelopment includes, but is not limited to: the expansion of a building footprint or addition or replacement of a structure; structural development including an increase in gross floor area and/ or exterior construction or remodeling; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities related with structural or impervious surfaces~~ **exposed to rainfall**.

"Restaurant" means a stand-alone facility that sells prepared foods and drinks for consumption, including stationary lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. (SIC code 5812).

"Retail Gasoline Outlet" means any facility engaged in selling gasoline and lubricating oils.

"Source Control BMP" means any schedules of activities, prohibitions of practices, maintenance procedures, managerial practices or operational practices that aim to prevent storm water pollution by reducing the potential for contamination at the source of pollution.

"Storm Event" means a rainfall event that produces more than 0.1 inch of precipitation and that, which is separated from the previous storm event by at least 72 hours of dry weather.

"Structural BMP" means any structural facility designed and constructed to mitigate the adverse impacts of storm water and urban runoff pollution (e.g. canopy, structural enclosure). The category may include both Treatment Control BMPs and Source Control BMPs.

"Treatment" means the application of engineered systems that use physical, chemical, or biological processes to remove pollutants. Such processes include, but are not limited to, filtration, gravity settling, media adsorption, biodegradation, biological uptake, chemical oxidation and UV radiation.

"Treatment Control BMP" means any engineered system designed to remove pollutants by simple gravity settling of particulate pollutants, filtration, biological uptake, media adsorption or any other physical, biological, or chemical process.

CONFLICTS WITH LOCAL PRACTICES
Where provisions of the SUSMP requirements conflict with established local codes, (e.g., specific language of signage used on storm drain stenciling), the Permittee may continue the local practice and modify the SUSMP to be consistent with the code, except that to the extent that the standards in the SUSMP are more stringent than those under local codes, such more stringent standards shall apply.

SUSMP PROVISIONS APPLICABLE TO ALL CATEGORIES

REQUIREMENTS

1. PEAK STORM WATER RUNOFF DISCHARGE RATES

~~Post~~ **To the maximum extent feasible, post**-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.

2. CONSERVE NATURAL AREAS

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Concentrate or cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

3. MINIMIZE STORM WATER POLLUTANTS OF CONCERN

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system. The development must be designed so as to minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern, consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at a concentrations or loads considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, "minimization of the pollutants of concern" will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks*; *Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide*; *Manual for Storm Water Management in Washington State*; *The Maryland Stormwater Design Manual*; *Florida Development Manual: A Guide to Sound Land and Water Management*; Denver *Urban Storm Drainage Criteria Manual, Volume 3 – Best*

Management Practices and *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* , USEPA Report No. EPA-840-B-92-002, as "likely to have significant impact" beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants.

Examples of BMPs that can be used for minimizing the introduction of pollutants of concern generated from site runoff are identified in Table 2. Any BMP not specifically approved by the Regional Board in Resolution No. 99-03, "Approving Best Management Practices for Municipal Storm Water and Urban Runoff Programs in Los Angeles County", for development planning may be used if they have been recommended in one of the above references.

4. PROTECT SLOPES AND CHANNELS

Project plans must include BMPs consistent with local codes and ordinances and the SUSMP to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Utilize natural drainage systems to the maximum extent practicable
- Control or reduce or eliminate flow to natural drainage systems to the maximum extent practicable
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought tolerant vegetation.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game

5. PROVIDE STORM DRAIN SYSTEM STENCILING AND SIGNAGE

Storm drain stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets. The stencil contains a brief statement that prohibits the dumping of improper materials into the storm water conveyance system. Graphical icons, either illustrating anti-dumping symbols or images of receiving water fauna, are effective supplements to the anti-dumping message.

- All storm drain inlets and catch basins within the project area must be stenciled with prohibitive language (such as: "NO DUMPING – DRAINS TO OCEAN") and/or graphical icons to discourage illegal dumping.
- Signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, must be posted at public access points along channels and creeks within the project area.
- Legibility of stencils and signs must be maintained.

6. PROPERLY DESIGN OUTDOOR MATERIAL STORAGE AREAS

Outdoor material storage areas refer to storage areas or storage facilities solely for the storage of materials. Improper storage of materials outdoors may provide an opportunity for toxic compounds, oil and grease, heavy metals, nutrients, suspended solids, and other pollutants to enter the storm water conveyance system. Where proposed project plans include outdoor areas for storage of materials that may contribute pollutants to the storm water conveyance system, the following Structural or Treatment BMPs are required:

- Materials with the potential to contaminate storm water must be: (1) placed in an enclosure such as, but not limited to, a cabinet, shed, or similar structure that prevents contact with runoff or spillage to the storm water conveyance system; or (2) protected by secondary containment structures such as berms, dikes, or curbs.
- The storage area must be paved and sufficiently impervious to contain leaks and spills.
- The storage area must have a roof or awning to minimize collection of storm water within the secondary containment area.

7. PROPERLY DESIGN TRASH STORAGE AREAS

A trash storage area refers to an area where a trash receptacle or receptacles are located for use as a repository for solid wastes.

Loose trash and debris can be easily transported by the forces of water or wind into nearby storm drain inlets, channels, and/or creeks. All trash container areas must meet the following Structural or Treatment Control BMP requirements (individual single family residences are exempt from these requirements):

- Trash container areas must have drainage from adjoining roofs and pavement diverted around the area(s).

- Trash container areas must be screened or walled to prevent off-site transport of trash.

8. PROVIDE PROOF OF ONGOING BMP MAINTENANCE

Improper maintenance is one of the most common reasons why water quality controls will not function as designed or which may cause the system to fail entirely. It is important to consider who will be responsible for maintenance of a permanent BMP, and what equipment is required to perform the maintenance properly. As part of project review, if a project applicant has included or is required to include, Structural or Treatment Control BMPs in project plans, the Permittee shall require that the applicant provide verification of maintenance provisions through such means as may be appropriate, including, but not limited to legal agreements, covenants, CEQA mitigation requirements and/or Conditional Use Permits.

For all properties, the verification will include the developer's signed statement, as part of the project application, accepting responsibility for all structural and treatment control BMP maintenance until the time the property is transferred and, where applicable, a signed agreement from the public entity assuming responsibility for Structural or Treatment Control BMP maintenance. ~~The transfer of property to a private or public owner must have conditions requiring the recipient to assume responsibility for maintenance of any Structural or Treatment Control BMP to be included in the sales or lease agreement for that property, and will be the owner's responsibility. The condition of transfer shall include a provision that the property owners conduct maintenance inspection of all Structural or Treatment Control BMPs at least once a year and retain proof of inspection. For residential properties where the Structural or Treatment Control BMPs are located within a common area which will be maintained by a homeowner's association, language regarding the responsibility for maintenance must be included in the projects conditions, covenants and restrictions (CC&Rs). Printed educational materials will be required to accompany the first deed transfer to highlight the existence of the requirement and to provide information on what storm water management facilities are present, signs that maintenance is needed, how the necessary maintenance can be performed, and assistance that the Permittee can provide. The transfer of this information shall also be required with any subsequent sale of the property.~~

If Structural or Treatment Control BMPs are located within a public area proposed for transfer, they will be the responsibility of the developer until they are accepted for transfer by the County or other appropriate public agency. Structural or Treatment Control BMPs proposed for transfer must meet design standards

adopted by the public entity for the BMP installed and should be approved by the County or other appropriate public agency prior to its installation.

9. DESIGN STANDARDS FOR STRUCTURAL OR TREATMENT CONTROL BMPs[1]

~~Structural or Treatment~~ **Unless otherwise exempted, post-construction structural or treatment** control BMPs selected for use at any **New Development or Redevelopment** project covered by this SUSMP**, where the New Development or Redevelopment project will result in additional storm water runoff, in comparison to pre-project runoff from the project site, and where such additional runoff will not otherwise be captured or treated by proximate or regional structural or treatment control BMPs existing, or to be constructed within three (3) years from the date of completion of the project,** shall meet the design standards of this Section ~~unless specifically exempted.~~,

~~Post-construction Structural or Treatment Control~~ **The post-construction structural or treatment control** BMPs shall be designed to:

A. mitigate (infiltrate or treat) storm water runoff ~~from either:~~ **that results from:**

1. ~~the 85th percentile 24-hour runoff event determined as~~ **the volume of runoff produced from the 70th percentile 24-hour storm event for 100,000 Square Foot Commercial Developments, the 60th percentile 24-hour storm event for Automotive Repair Shops, Retail Gasoline Outlets and Restaurants, and the 50th percentile 24-hour storm event for Home Subdivisions with 100 or More Housing Units, as determined from the historical record-based cumulative occurrence probability for the referenced rain gauge in Los Angeles County as developed by the County of Los Angeles, Department of Public Works; or**

2. the maximized capture storm water volume ~~for the area, from the formula recommended~~ **determined through the application of formulas 5.1 and 5.2** in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998)~~,~~ **where i = the imperviousness ratio for the project as determined by the project engineer or derived from the list of imperviousness ratio developed by the County of Los Angeles Department of Public Works for the land use(s) proposed for the New Development or Redevelopment project, a = the event capture ratio for a 24-hour drain time from Table 5.4, and P_6 = .60 from Figure 5.3;** or

3. the volume of annual runoff based on unit basin storage water quality volume, to achieve ~~80~~ **70** percent or more volume treatment ~~by the method recommended in~~ **for 100,000 Square Foot Commercial Developments by the method set forth in Appendix D to the** *California Stormwater Best Management Practices Handbook – ~~Industrial/ Commercial, (1993), or~~* ***Municipal,*** **(1993), 60 percent or more for Automotive Repair Shops, Retail Gasoline Outlets and Restaurants, and 50 percent or more for Home Subdivisions with 100 or more housing units; or**

4. ~~the volume of runoff produced from a 0.75 inch storm event, prior to its discharge to a storm water conveyance system, or~~ **the water quality capture volume for the Los Angeles region as determined by the formulas for water quality capture outside the Denver region contained in Section 4.4.2 of the *Urban Storm Drainage Criteria Manual, Volume 3,* update, published by the Urban Drainage and Flood Control District, Denver, Colorado, September 1, 1999;**

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1 The numeric criteria set forth herein are included ***only*** for purposes of analysis as a starting point for review by the proposed State-wide Storm Water Quality Technical Advisory Committee.

~~the volume of runoff produced from a historical-record based reference 24-hour rainfall criterion for "treatment" (0.75 inch average for the Los Angeles County area) that achieves approximately the same reduction in pollutant loads achieved by the 85th percentile 24-hour runoff event,~~ AND

~~AND~~

~~B. control~~ B. Control peak flow discharge to provide stream channel and over bank flood protection, based on flow design criteria selected by the local agency.

~~Limited Exclusion~~ C. Exclusions

1. ~~Restaurants, where the land area for development or redevelopment is less than 5,000 square feet, are excluded from the numerical Structural or Treatment Control BMP design standard requirement only.~~ All pre-project storm water runoff shall be excluded from the calculations referenced in Subsection 9(A) above, until such time as a State-Wide Urban Storm Water Mitigation Fund has been created that enables project applicants to seek reimbursement for all costs and fees incurred in addressing pre-project storm water runoff, as well as costs and fees paid to Permittees in the form of permit fees and oversight and administrative review costs.

2. Retail Gasoline Outlets which implement all applicable requirements of the California Storm Water Quality Task Force Best Management Practice Guide for Retail Gasoline Outlets (March 1997) shall be excluded from the Numerical Design Standards set forth in Subsection 9(A) above.

10. PROVISIONS APPLICABLE TO INDIVIDUAL PRIORITY PROJECT CATEGORIES

REQUIREMENTS

A. 100,000 SQUARE FOOT COMMERCIAL DEVELOPMENTS

1. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water runon or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all washwater, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the

storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. The area in the site design must be:

- Self-contained and/ or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer.

B. RESTAURANTS

1. PROPERLY DESIGN EQUIPMENT/ACCESSORY WASH AREAS

The activity of outdoor equipment/accessory washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for the washing/steam cleaning of equipment and accessories. This area must be:

- Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
- If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer.

C. RETAIL GASOLINE OUTLETS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. The project plans must include the following BMPs:

- The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
- The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water to the extent practicable.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

D. AUTOMOTIVE REPAIR SHOPS

1. PROPERLY DESIGN FUELING AREA

Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the storm water conveyance system. Therefore, design plans, which include fueling areas, must contain the following:

- The fuel dispensing area should be covered with an overhanging roof structure or canopy. The cover's minimum dimensions must be equal to or greater than the area within the grade break. The cover must not drain onto the fuel dispensing area and the downspouts must be routed to prevent drainage across the fueling area.
- The fuel dispensing areas must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
- The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of storm water.
- At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.
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2. PROPERLY DESIGN REPAIR/MAINTENANCE BAYS

Oil and grease, solvents, car battery acid, coolant and gasoline from the repair/maintenance bays can negatively impact storm water if allowed to come into contact with storm water runoff. Therefore, design plans for repair bays must include the following:

- Repair/maintenance bays must be indoors or designed in such a way that doesn't allow storm water run-on or contact with storm water runoff.
- Design a repair/maintenance bay drainage system to capture all wash-water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair/maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.

3. PROPERLY DESIGN VEHICLE/EQUIPMENT WASH AREAS

The activity of vehicle/equipment washing/steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the storm water conveyance system. Include in the project plans an area for washing/steam cleaning of vehicles and equipment. This area must be:

- Self-contained and/or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or to a permitted disposal facility.

4. PROPERLY DESIGN LOADING/UNLOADING DOCK AREAS

Loading/unloading dock areas have the potential for material spills to be quickly transported to the storm water conveyance system. To minimize this potential, the following design criteria are required:

- Cover loading dock areas or design drainage to minimize run-on and runoff of storm water.
- Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

E. PARKING LOTS

1. PROPERLY DESIGN PARKING AREA

Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor-vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:

- Reduce impervious land coverage of parking areas
- Infiltrate runoff before it reaches storm drain system.
- Treat runoff before it reaches storm drain system

2. PROPERLY DESIGN TO LIMIT OIL CONTAMINATION AND PERFORM MAINTENANCE

Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks.

- Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces , sports event parking lots, shopping malls, grocery stores, discount warehouse stores)
- Ensure adequate operation and maintenance of treatment systems particularly sludge and oil removal, and system fouling and plugging prevention control

11. WAIVER

A Permittee may, through adoption of an ordinance or code incorporating the treatment requirements of the SUSMP, provide for a waiver from the ~~requirement~~ **Numerical Design Standards under Section 9 above,** if impracticability for a specific ~~property~~ **project** can be established. A waiver of impracticability shall be granted only when all ~~other~~ **reasonable** Structural or Treatment Control BMPs have been considered and rejected as infeasible **or impracticable**. Recognized ~~situations~~ **circumstances** of impracticability include~~,~~**;** (i) ~~extreme~~ limitations of space ~~for treatment on a redevelopment project,~~ **at a Redevelopment project;** (ii) unfavorable or unstable soil conditions at a site to attempt infiltration~~, and~~**;** (iii) **a reasonable** risk of ground water contamination ~~because a known unconfined aquifer lies beneath the land surface or an existing or potential underground source of drinking water is less than 10 feet from the soil surface. Any other justification for impracticability must be separately petitioned by the Permittee and submitted to the Regional Board for consideration. The Regional Board may consider approval of the waiver justification or may delegate the authority to approve a class of waiver justifications to~~ **that cannot otherwise be reasonably mitigated; (iv) a reasonable risk of harm to the health and safety of the public as a result of potential vectors that cannot reasonably be mitigated; and (v) such other grounds for impracticably as may be established by the Project Applicant as reviewed and approved by the Permittee. A waiver granted by a Permittee for any New Development or Redevelopment project may be revoked by** the Regional Board Executive Officer~~. The supplementary waiver justification becomes recognized and effective only after approval by the Regional Board or the Regional Board Executive Officer. A waiver granted by a Permittee to any development or redevelopment project may be revoked by the Regional Board Executive Officer~~ for cause and with proper notice upon petition **within thirty (30) days**.

If a waiver is granted for impracticability, the Permittee ~~must~~ **shall** require the project ~~proponent to transfer the savings in cost~~ **applicant to pay a mitigation fee**, as determined by the Permittee, to a

~~storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity.~~ **be applied by the Permittee towards the cost, including administrative costs, of developing an alternative solution, specifically including but not limited to, a regional solution to storm water runoff pollutants created from the proposed project. The Permittee shall establish a nexus between the amount of the fees imposed on the project applicant, the volume of storm water runoff, and the pollutants of concern from the proposed project, and the proposed alternative solution.**

Within twelve (12) months from the effective date of this SUSMP, the Regional Board shall, develop a matching fund program to match each dollar collected by the Permittees under this Waiver provision, whereby such funds received from the Regional Board shall be used by the Permittees to implement, administer and develop alternative and other regional solutions to urban storm water runoff, and to otherwise administer the Standard Urban Storm Water Mitigation Plan.

12. LIMITATION ON USE OF INFILTRATION BMPs

Three factors significantly influence the potential for storm water to contaminate ground water. They are (i) pollutant mobility, (ii) pollutant abundance in storm water, (iii) and soluble fraction of pollutant. The risk of contamination of groundwater may be reduced by pretreatment of storm water. A discussion of limitations and guidance for infiltration practices is contained in, *Potential Groundwater Contamination from Intentional and Non-Intentional Stormwater Infiltration, Report No. EPA/600/R-94/051, USEPA (1994).*

In addition, the distance of the groundwater table from the infiltration BMP may also be a factor determining the risk of contamination. A water table distance separation of ten feet depth in California presumptively poses negligible risk for storm water not associated with industrial activity or high vehicular traffic.

Infiltration BMPs are not recommended for areas of industrial activity or areas subject to high vehicular traffic (25,000 or greater average daily traffic (ADT) on main roadway or 15,000 or more ADT on any intersecting roadway) unless appropriate pretreatment is provided to ensure groundwater is protected and the infiltration BMP is not rendered ineffective by overload.
12.

13. ALTERNATIVE CERTIFICATION FOR STORM WATER TREATMENT MITIGATION

In lieu of conducting detailed BMP review to verify Structural or Treatment Control BMPs adequacy, a Permittee may elect to accept a signed certification from a Civil Engineer or a Licensed Architect registered in the State of California, that the plan meets the criteria established herein. The Permittee is encouraged to verify that certifying person(s) have been trained on BMP design for water quality, not more than two years prior to the signature date. Training conducted by an organization with storm water BMP design expertise (e.g., a University, American Society of Civil Engineers, American Society of Landscape Architects, American Public Works Association, or the California Water Environment Association) may be considered qualifying.

14. RESOURCES AND REFERENCE

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over the age of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fourteenth Floor, Costa Mesa, California 92626-1998.

On July 6, 2000, I served on interested parties in said action the within:

PETITIONERS' POST-HEARING REPLY BRIEF TO JUNE 12, 2000 STATE BOARD INQUIRY

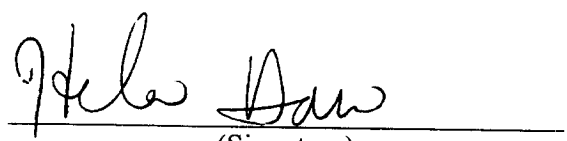
by placing a true copy thereof in sealed envelope(s) addressed as stated on the attached mailing list.

I am readily familiar with this firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. postal service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

Executed on July 6, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Helen Davis
(Type or print name)


(Signature)

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Attorneys for Petitioners

RECEIVED
00 JUL 31 PM 2:13
CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BELL GARDENS, BURBANK, CERRITOS, COMMERCE, COMPTON, DIAMOND BAR, DOWNEY, HAWAIIAN GARDENS, HUNTINGTON PARK, INDUSTRY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, MONTEBELLO, PALOS VERDES ESTATES, PARAMOUNT, PICO RIVERA, POMONA, RANCHO PALOS VERDES, ROSEMEAD, SAN GABRIEL, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation,

Petitioners,

vs.

THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board,

Respondents.

Case Nos. A-1280, A-1280(a), and A-1280(b)

PETITIONERS' RESPONSE TO NRDC'S OBJECTIONS TO PETITIONERS' POST-HEARING BRIEF

Hearing
Date: June 7-8, 2000
Time: 10:00 a.m.
Location: 3350 Civic Center Drive
Torrance, CA 90503

Petitioners Bellflower, et al. respectfully reply to the objections of the NRDC to said Petitioners' Post-Hearing Brief as follows:

I. PETITIONERS' POST HEARING BRIEF WAS SPECIFICALLY RESPONSIVE TO THE STATE BOARD'S JUNE 12, 2000 REQUEST AND COMPLIED WITH THE REQUIREMENTS OF SUCH REQUEST.

The NRDC objects to Petitioners' Post-Hearing Brief because of the attached proposed revisions to the Regional Board's SUSMP Program.[1] The short answer to the NRDC's objection is that the Petitioners' Post-Hearing Brief complies with the State Board's June 12 directive. First, the attached proposed SUSMP language is ***summarized in the text of the Brief*** itself and each of the proposed revisions to the Regional Board's SUSMP are explained within the 10-page Post-Hearing Brief. Second, the attached redlined SUSMP was not an additional exhibit, but is an existing document in the Record that has been modified to show changes in light of the June 12, 2000 State Board letter specifically requesting that ***"specific language that you believe should be included in the Standard Urban Storm Water Mitigation Plan (SUSMP)"*** be provided. Accordingly, the Post-Hearing Brief in addition to providing an explanation of the proposed changes, complies with this specific request of the State Board for ***"specific language" to be included*** in the SUSMP.

In addition, showing the actual revisions to the Regional Board's proposed SUSMP in a redlined fashion was necessary for the benefit of all the parties so that the context of the numerous changes to the SUSMP were readable and easily understood. Reviewing the ***"specific language"*** and deletions and changes to the SUSMP, without the benefit of their context, would have been virtually impossible given the numerous changes that were necessary. The original Regional Board's SUSMP itself contained some 15 pages of text and is already a part of the Record in these proceedings. The proposed changes to the SUSMP, as shown by the redlining, merely puts the specific language requested by the State Board in context. The NRDC may not agree with the changes, but given the State Board's request for ***"specific language"*** to be "included in the SUSMP," the NRDC's disagreement does not change either the specific request for the language,

[1] It is worth noting that the NRDC has filed objections to the Petitioners' Post-Hearing Brief, but has said nothing about the Regional Board's Brief, which is 10 pages of what appears to be six point print with even smaller print in the footnotes.

nor the relevance and importance of showing the changes in context on a document that is already in the Record. Given the length of the SUSMP and the numerous revisions and ***"specific language"*** added or modified, providing a redlined version of the SUSMP was not only consistent with the State Board's request, it was necessary so that the ***"specific language" to be included in the SUSMP*** could be understood and properly considered.

For the foregoing reasons, the Post-Hearing Brief is consistent with and in compliance with the State Board's June 12, 2000 Order, and Petitioners respectfully request that the NRDC's objections in this regard be overruled.

II. THE NRDC DOES NOT HAVE STANDING TO ASSERT THE ATTORNEY-CLIENT PRIVILEGE, AND THE DISCLOSURE AND INCLUSION OF THE COMMUNICATION IN THE ADMINISTRATIVE RECORD CONSTITUTES A WAIVER OF SUCH PRIVILEGE.

Interestingly, the NRDC attempts to assert the attorney-client privilege on behalf of the Regional Board, where the NRDC is not the client and thus is not the holder of the attorney-client privilege. California law is very clear that only the holder of the privilege, or a representative of the holder, is authorized to assert the privilege. (Evid. Code § 954.) There has been no showing by the NRDC that they are either the holder of the privilege, i.e., that they are Mr. Leon's client, or that they are "a person" authorized on behalf of the Regional Board to assert the privilege. Accordingly, ***the NRDC has no standing to assert the privilege***. (See Evid. Code § 954.)

Second, it is evident from the Regional Board's inclusion of this e-mail (Item 19 of Volume 2 of the Administrative Record) and other communications from counsel in the Record, that Respondents ***purposely*** included the information as a part of the Administrative Record, a Record that was made available to all of the parties in this Petition. Under California law, pursuant to Evidence Code Section 912, any privilege that would have attached to the communication in question, was clearly waived as a result of its inclusion in the Administrative Record and the making of the communication and all aspects of the Administrative Record available for public review. (See Evid. Code § 912(a).) Respondents apparently made the decision to include this and other documents in the Administrative Record to support their decision to impose the SUSMP on the Petitioners; Respondents cannot now hide behind the

NRDC and seek to exclude a document that confirms they acted improperly and in violation of the terms of the NPDES Permit in doing so. A***ccordingly, the initial inclusion of the document as a part of the Administrative Record constitutes a waiver under Evidence Code 912(a).***

In addition, the failure of the Regional Board, ***since the preparation of the Record***, to subsequently claim the privilege or to assert that the inclusion of the document was in any way inadvertent (specifically including its failure to assert the privilege months after the Administrative Record had been prepared and three (3) weeks after Petitioners have submitted their Post-Hearing Brief) is a ***"failure to claim the privilege in any proceeding in which the holder has a legal standing and opportunity to claim the privilege,"*** and is thus a second basis for waiver under Evidence Code Section 912(a). Respondent's failure to claim the privilege throughout these proceedings, and even now, constitutes a waiver of the privilege. (See, e.g., Calvert v. State Bar (1991) 54 Cal. 3d 765, 780; Scottsdale Insurance Co. v. Superior Court (1997) 59 Cal.App.4th 263, 274.)

Finally, the NRDC's mischaracterization of the communication does not change the printed words of the e-mail and the conclusions of the Regional Board's counsel that ***"it would take an act of the Board to amend the Permit to include non-discretionary activities"*** since to include non-discretionary activities ***"is beyond the scope of the Permit authority."*** Clearly, the Regional Board, and its counsel, knew that the plain language of the Permit did not provide for the application of SUSMPs to "non-discretionary activities," and further knew that their decision to apply the SUSMP to non-discretionary activities was directly contrary to the express terms of the Permit. The relevance of the e-mail, a copy of which is attached as Exhibit "A" hereto for the State Board's convenience, is apparent from its face.

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III. CONCLUSION.

Petitioners respectfully request that the objections of the NRDC to the Petitioners' Post-Hearing Brief be overruled in their entirety.

DATED: July 28 2000

RUTAN & TUCKER

By: _____
RICHARD MONTEVIDEO
Attorneys for Petitioners

From: Jorge Leon
To: Xavier Swamikannu
Date: 1/25/00 2:58PM
Subject: Re: SUSMP

1. It's my belief that, since the Permit says "discretionary," we're stuck. It simply does not include nondiscretionary activities. To include them in this proposal by the EO is beyond the scope of the Permit authority. It would take an act of the Board to amend the Permit to include non-discretionary activities.

2. I would recommend reading this liberally. I.e., the enumerated categories are inclusive of all types of development, including nondiscretionary activities. The enumerated categories are included are the list because there is sound evidence showing the need to control those discharges. These are within the EO's authority to control regardless of whether they are discretionary or not.

3, 4 and 5. I don't know enough about the remaining three issues yet, but will try to be conversant by tomorrow a.m.
>>> Dennis Dickerson 01/24/00 06:19PM >>>
Need a quick check on three issues:

1) The 1996 permit talks about discretionary projects. Can SUSMPs be applied to non-discretionary projects as well as discretionary or is the board limited in this instance. See Page 4 of the NRDC letter.

2) Are the enumerated categories comprehensive of all types of development?
Or are non-discretionary projects in a specified category included?

3) We are concerned about a single family home on a hillside but not, apparently, if the runoff is to an ESA. Is this distinction appropriate.

4) Xavier: is the change sheet definition for an ESA clear or what we discussed?

5) Xavier, there are some glitches with the change sheet that must be fixed tomorrow, i.e., references to pages in the change sheet don't match the Dec 7th version.

CC: Dennis Dickerson

EXHIBIT "A"

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over the age of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fourteenth Floor, Costa Mesa, California 92626-1998.

On July 28, 2000, I served on interested parties in said action the within:

PETITIONERS' RESPONSE TO NRDC'S OBJECTIONS TO PETITIONERS' POST-HEARING BRIEF

by placing a true copy thereof in sealed envelope(s) addressed as stated on the attached mailing list.

I am readily familiar with this firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. postal service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

Executed on July 28, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Helen Davis
(Type or print name)

Helen Davis
(Signature)

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74689.01 a07/28/00

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Attorneys for Petitioner
WESTERN STATES PETROLEUM ASSOCIATION

STATE OF CALIFORNIA

STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Petitions of the Cities of Bellflower, et al., the City of Arcadia, and Western States Petroleum Association, Petitioners, For Review of January 26, 2000 Action of the Regional Board, and Actions and Failures to Act by Both the Regional Board and its Executive Officer Pursuant to Order No. 96-054, Permit for Municipal Storm Water and Urban Run-Off Discharges within Los Angeles County [NPDES No. CAS614001]	FILE NOS. A-1280, A-1280(a) and A-1280(b) **WESTERN STATES PETROLEUM ASSOCIATION'S COMMENTS ON THE BOARD'S TENTATIVE ORDER**

Pursuant to the Board's August 28, 2000 Order, the Western States Petroleum Association ("WSPA") submits these comments on the Board's tentative order in this matter.

SUMMARY

WSPA fully supports the Board's tentative order that retail gasoline outlets be excluded from the numeric design standards of the Standard Urban Stormwater Mitigation Plan ("SUSMP"). Retail gasoline outlets are already heavily regulated under federal, state and local requirements and the SUSMP numeric design standards are neither feasible nor proven effective for retail gasoline outlets. In lieu of the SUSMP numeric design standards, WSPA urges the Board to encourage the statewide

adoption of the best management practices developed and published by the California Stormwater Task Force in their March 1997 Best Management Practice Guide for Retail Gasoline Outlets (the "Task Force BMPs").

COMMENTS

I. WSPA Fully Supports the Exclusion of Retail Gasoline Outlets From the SUSMP Numeric Design Standards.

WSPA applauds the Board's recognition that retail gasoline outlets should not be subject to the numeric design standards of the SUSMP. Due to the plethora of regulations which already apply to retail gasoline outlets and the practical problems of implementing stormwater infiltration or treatment systems at retail gasoline outlets, the SUSMP numeric design requirements are neither necessary nor are they a practical option.

Retail gasoline outlets are heavily regulated at the federal, state and local level. For example, retail gasoline outlets are subject to USEPA regulation of underground storage tanks; federal spill prevention, containment and control requirements; OSHA requirements; state and local fire codes; state and local requirements for hazardous materials and emergency response plans; state and local underground storage tank requirements; state and local building codes; national, state, and local air regulations; and numerous other requirements. Indeed, additional regulations on underground storage tanks are expected to take effect in California in the near future.

As shown during the hearing and detailed in WSPA's prior filings, retail gasoline outlets are limited in their ability to construct treatment/infiltration facilities. Requiring infiltration at retail gasoline outlets would likely cause subsurface contamination as accidental spillage of gasoline is directed into the soil. Further, there is no evidence that the other potential treatment devices allowed by the SUSMP would be effective at controlling any pollutants from retail gasoline outlets. Moreover, several types of treatment devices (such as oil/water separators, sand filters, and compost filters) would require that an additional subterranean structure be built beneath the retail gasoline outlet and could result in a potentially hazardous situation.

For these reasons, WSPA strongly supports the Board's decision to exclude retail gasoline outlets from the numeric design standards of the SUSMP.

II. WSPA Supports the Implementation of the Task Force BMPs Throughout California.

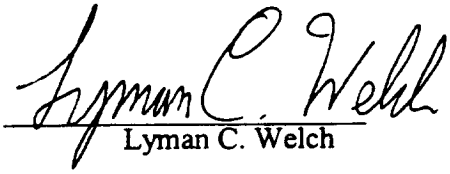
The tentative order's statement that the Task Force BMPs "should be considered for inclusion" in the SUSMPs (Board Tentative Order, p. 22, footnote 49) is laudable and should provide direction to other regional boards. WSPA asks that the tentative order be expanded to encourage other regional boards to specify use of the Task Force BMPs in stormwater permits in their regions. The question of what BMPs should apply to retail gasoline outlets is likely to arise in connection with permit applications or renewals other than the SUSMP. Indeed, the Los Angeles Regional Board has implemented provisions almost identical to the SUSMP in the NPDES permit for the County of Ventura. (The Ventura permit is the subject of WSPA's petition for review in SWRCB/OCC File A-1320(a)). Moreover, San Diego's Regional Board has recently postponed consideration of numeric sizing criteria for permits pending ongoing efforts to develop statewide standards.

As shown at the hearing, the Task Force BMPs are appropriate for use throughout California as a means to prevent and/or reduce stormwater pollution from retail gasoline outlets. Since the Task Force BMPs were developed and published by the California Stormwater Quality Task Force, WSPA has encouraged the implementation of the Task Force BMPs throughout California by both existing retail gasoline outlets and new facilities. Support for implementation of the Task Force BMPs throughout California in the tentative order would improve control of stormwater runoff and avoid future piecemeal appeals of individual permits which do not follow the Task Force BMPs or the Board's tentative order in this matter.

DATED: September 27, 2000

Respectfully submitted,

MAYER, BROWN & PLATT
GREGORY R. McCLINTOCK
LYMAN C. WELCH

By: 
Lyman C. Welch

R0072999

Attorneys for Petitioner
WESTERN STATES PETROLEUM ASSOCIATION

PROOF OF SERVICE

The undersigned certifies that a copy of the Western States Petroleum Association's Comments on The Board's Tentative Order was served upon the following by enclosing a true and correct copy of the same in an envelope addressed to them and sent by U.S. mail on the 27th day of September, 2000.

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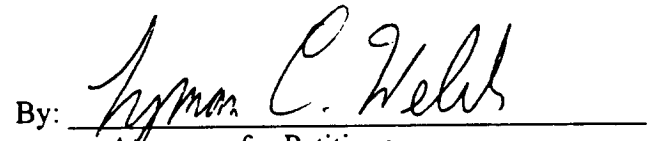
By: 

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September 27, 2000

VIA OVERNIGHT DELIVERY

Craig M. Wilson, Esq.
State Water Resources Control Board
901 "P" Street
Sacramento, California 95814

Re: In Re SWRCB/OCC Files A-1280, A-1280(a) and A-1280(b)

Dear Mr. Wilson:

Pursuant to the State Board's letter of August 28, 2000 in connection with the above-referenced Petitions, enclosed please find written comments on behalf of the Petitioners, Cities of Bellflower, et al. to the State Board's proposed Draft Order dated August 24, 2000 and its attached Amendments to SUSMPs dated August 10, 2000.

Thank you for the opportunity to present these comments. Please do not hesitate to contact the undersigned should you have any questions with respect to the enclosed.

Sincerely,

RUTAN & TUCKER, LLP

Richard Montevideo

RM:jb
Enclosure
cc: Attached Service List

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PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BELL GARDENS, BURBANK, CERRITOS, COMMERCE, COMPTON, DIAMOND BAR, DOWNEY, HAWAIIAN GARDENS, HUNTINGTON PARK, INDUSTRY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, MONTEBELLO, PALOS VERDES ESTATES, PARAMOUNT, PICO RIVERA, POMONA, RANCHO PALOS VERDES, ROSEMEAD, SAN GABRIEL, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, Petitioners, vs. THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board, Respondents.	Case No. A-1280, A-1280(a) and A-1280(b) PETITIONERS' WRITTEN COMMENTS TO AUGUST 24, 2000 DRAFT ORDER OF THE STATE WATER RESOURCES CONTROL BOARD

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Petitioners herein respectfully submit the following comments on the State Board's August 24, 2000 Draft Order ("Order"), inclusive of Attachment A which sets forth additional proposed changes to Respondents' SUSMP and which are incorporated herein and made a part of these written comments.

I. INTRODUCTION.

With these comments, Petitioners seek clarification of the findings of the Order and/or revisions to the Order to resolve internal inconsistencies within the Order, as well as to resolve inconsistencies between the Order and the evidence presented through the Petition process. Petitioners do not seek to reargue the issues raised by the Petition with these comments, but continue to maintain that each and every argument in the Petition, and in the supporting briefs and submissions, are correct and appropriate, and contend that the Respondents' actions, both procedurally and substantively, were inconsistent with the Permit and State and federal law. Petitioners further contend that the Respondents' SUSMP should have been invalidated in its entirety by the State Board. Accordingly, the comments herein are submitted without prejudice to Petitioners' prior arguments in these proceedings or in any subsequent proceeding.[1]

II. THE DRAFT ORDER SHOULD BE MODIFIED TO ALLOW FOR THE DEVELOPMENT OF REGIONAL SOLUTIONS AS TRUE ALTERNATIVES TO THE SITE-BY-SITE OR PROJECT-BY-PROJECT MANDATE.

Throughout the course of these proceedings, Petitioners have consistently contended that

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[1] For example, Petitioners continue to contend the .75 numerical design standard is a one-size-fits-all standard that was not developed based on sound science considering the pollutants of concern and the sources of those pollutants. The .75 standard also does not account for the differences in the development categories and the need for different SUSMPs and/or different design standards. If the SUSMP was to apply the same inflexible numerical design standard to all development categories, then what purpose did the Respondents have in creating in the NPDES Permit two different residential development categories, one category for subdivisions with 10 or more homes, and a second category for subdivisions with 100 or more units. (Permit, p. 34, Part III.A.1.c.) If identical standards and SUSMPS were to apply to both categories, then only one category, the 10+ home subdivision category, was necessary. Clearly the former category would include the latter, and this distinction would have no meaning unless different SUSMP standards were to apply to different development categories. Petitioners continue to maintain that the Administrative Review Process was the appropriate and only process to address such concerns with the SUSMP, and that this process was blatantly violated, both procedurally and substantively by the Respondents' refusal to administratively process the Permittees' SUSMP, and thereafter by their actions in mandating a SUSMP that was not agreed to by the Permittees.

Respondents should have allowed for ***regional alternatives*** in the SUSMP to the site-by-site or project-by-project mandated programs. The development of regional facilities must be recognized as providing the best solution to this State's urban runoff problems. Yet, as written, the Respondents' SUSMP provides no flexibility or allowance for regional solutions, and even the State Board's Draft Order, although ***encouraging*** the development of regional solutions, does not provide for such solutions as ***alternatives*** to the site-by-site, project-by-project programs in Respondents' SUSMP. (Draft Order, p. 21.)

In at least two separate sections of the Draft Order, the State Board recommends that the Permittees and other interested agencies "***work to develop regional solutions so that individual dischargers are not forced to create numerous small-scale projects. While the SUSMPs are an appropriate means of requiring mitigation of storm water discharges, we also encourage innovative regional approaches.***" (Draft Order, p. 21.) The State Board further finds that "cost savings" could be achieved "if the Permittees developed a ***regional solution*** for the problem," (Draft Order, p. 21) and that ***"[a]s a long-term strategy, municipal storm water dischargers should work to establish regional mitigation facilities, which may be more cost-effective and more technically effective than mitigation structures at individual developments."*** (Draft Order, p. 26.)

In spite of the above findings, no specific language was incorporated by the State Board into the SUSMP to effectuate this objective, and ***no incentive*** was provided to "the cities and the County, along with other interested agencies, [to] work to develop regional solutions." In short, without the incorporation of additional modifications to the Regional Board's SUSMP, the development of a "regional solution" will not avoid the creation of "numerous small-scale projects," since under the Draft Order, irrespective of whether a regional solution is appropriate and more technically and economically effective, individual SUSMPs for the "numerous small-scale projects" still appear to be required.

In reality, the only way "innovative regional approaches" can truly be encouraged is to incorporate "regional solutions" as true alternatives to the numerous small-scale projects within the SUSMP itself. Unless the development of regional approaches are true alternatives to the site-

by-site or project-by-project mandate, no "regional solutions" will be developed as they would serve no purpose.

As discussed in Petitioners' Post Hearing Brief, the State of Washington's 1999 Draft Storm Water Manual expressly allows local governments to exempt redevelopment projects if they have adopted a plan that fulfills the requirements in issue through "regional facilities." Furthermore, the State of Florida expressly recognizes in their BMPs that "***[r]egional stormwater systems, which manage the stormwater from several developments or the entire drainage basin, offer many advantages over the piecemeal approach that relies upon small, individual onsite systems.***" (See FLA. BMPs § 2.2F.)

In addition, the concept of a regional approach as an "alternative" to individual site-by-site systems, is by no means a new or novel concept. From individual water wells as compared to the intricate water delivery system presently utilized by the Metropolitan Water District and other water purveyors, to the use of regional sewage treatment facilities in comparison to individual septic tanks, to the delivery of any public utility including, for example, electricity, in comparison to an individual generator on particular projects sites, it is apparent that regional solutions to urban storm water runoff problems must be developed before any SUSMP program can be successful.

The Clean Water Act ("Act"), in sections 208 and 319, recognizes the utility of region-based solutions to non-point source water pollution. (33 U.S.C. §§ 1288-1289; 33 U.S.C. § 1329 & § 1329(b)(4) [requiring states "to the maximum extent practicable implement a management program . . . on a **watershed-by-watershed basis** . . . . "].) In implementing the Act, U.S. EPA has **strongly** encouraged and relied upon regional options for water quality regulations. (See, e.g., U.S. EPA & Dept. of Agriculture, EPA-840-R-98-001 Clean Water Action Plan: Restoring and Protecting America's Waters 81 (1998); Notice of Availability of Clean Water Action Plan 63 Fed.Reg. 14109 (summarizing Action Plan); Office of Water, U.S. EPA, EPA-841-R-97-011, Statewide watershed management facilitation (1997); Office of Water, U.S. EPA, EPA-840-S-96-001, Watershed Approach Framework (1996); Assessment and Watershed Protection Division, U.S. EPA, EPA-841-R-95-003, Watershed Protection: A Project Focus (1995).)

Failing to expressly allow "regional solutions" within the final SUSMP would be a step

backwards in time to the use of septic tanks on individual sites to process sewage, and is a limitation that will only delay implementation of a successful SUSMP Program. The attached proposed additional amendments to the final SUSMP (Attachment "A") are ***in addition*** to those changes proposed by the State Board in its Draft Order. Specifically, as to the incorporation of the principle of "regional alternatives," Petitioners would suggest that a second paragraph be added to the Limited Exclusion section of Section 9 "Design Standards for Structural or Treatment Control BMPs," to read as follows:

Limited Exclusions

The project applicant may comply with the numerical Structural or Treatment Control BMP design standard by utilizing proximate or regional Structural or Treatment Control BMPs as alternatives to site-by-site or project-by-project BMPs.

Petitioners respectfully request that the Draft Order be revised to incorporate the above-proposed revisions to Respondents' SUSMP in order to truly utilize "regional alternatives" to the creation of "numerous small-scale projects."[2]

III. LOW/MODERATE INCOME HOUSING PROJECTS AND SINGLE FAMILY HILLSIDE HOMES SHOULD BE EXEMPT FROM THE SUSMP'S .75 STANDARD.

A. Low/Moderate Income Housing Should be Exempt from the .75 Standard.

Petitioners submitted substantial evidence at the time of the hearing on the Petition showing that compliance with the .75 standard for low/moderate income homes would both increase the unit cost of such homes, and decrease the number of available units. (See, e.g., Testimony of Ms. Dee Zinke, June 7, 2000 Transcripts, p. 189, lines 9-18, and p. 190, lines 3-11.)

Evidence was further presented that the application of the .75 standard as a one-size fits all standard to all covered projects, would result in disparate treatment of residents of low/moderate income units, as the cost per unit to comply would be greater on a per unit basis (given the limited

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[2] To the extent the existing language in Respondents' SUSMP can be interpreted to provide for the flexibility of using a regional alternative in accordance with the above proposed language, Petitioners respectfully request that the State Board's Draft Order be amended to clarify the State Board's interpretation in this regard.

open space as compared to other single family developments). (See Testimony of Ms. Dee Zinke June 7, 2000 Transcripts, p. 190, line 12 through p. 191, line 22.) Accordingly, the actual and percentage cost per unit to comply with the .75 numerical design mandate on low/moderate income housing would be higher than the same cost for other single family housing units. Additional concerns were expressed over the environmental injustice created by such disproportionate impacts and the general discriminatory impact on low-income communities. (*Id.* at 190, lines 12-22; also see testimony of Mayor Margaret Clark, June 7, 2000 Transcript, p. 25 lines 11-19.)

Further, no evidence was submitted by the Respondents (or any other party) to refute the Petitioners' evidence and its arguments on the disparate impact, and the record remains uncontroverted that low/moderate income housing projects will be adversely and disparately impacted by the application of the .75 standard. (Id.)

Finally, neither Respondents nor any other party submitted any evidence to show that the "new development" or redevelopment" of low/moderate income units as a whole will have any material adverse impact on the region's urban runoff. Yet, clearly the reverse is true and is unrefuted, i.e., the .75 standard, if imposed on low/moderate income housing projects, will have a material adverse impact on the development of such necessary housing. Petitioners therefore propose that an exception to the application of the .75 numerical standard to 10+ and 100+ home subdivisions be added for low/moderate income housing projects. (See Attachment "A" hereto.)

During the course of these proceedings, Petitioners have argued strenuously that a "one-size-fits-all standard" was inappropriate and that different standards, depending on the type of development and pollutants of concern and the sources of those pollutants, should have been developed. In particular, in its post hearing brief, Petitioners proposed exempting ***all*** single family 10-99 units subdivisions, single family hillside homes and low/moderate income housing projects from the .75 standard. Understanding the State Board has not been persuaded to apply such a broad exemption, Petitioners respectfully request that, at a minimum, low/moderate income housing units and single family hillside homes be excluded from the application of the .75 standard.

B. **Single Family Hillside Homes Should be Exempt from the .75 Standard.**

The Draft Order, at page 18, provides that: "[t]he evidence shows that each listed category can be a significant source of pollutants and/or runoff following development. It is appropriate that the design standards apply so that BMPs for these categories of development result in the infiltration or treatment of a significant about [amount] of the runoff." (Draft Order, p. 18.)

Yet, with respect to "single family hillside homes," no evidence was submitted at the hearing or otherwise to support the application of a .75 numerical standard (or any other numerical standard) to such developments. Nor did Respondents provide any justification for distinguishing a single family hillside home from a single family non-hillside home, and no argument was made by the Respondents (in spite of various arguments by Petitioners concerning the impact of the SUSMP on individual homeowners and the concern over a one-size fits all standard), that the .75 standard should be discriminately applied to single family ***hillside*** units.

Although Petitioners do not oppose applying the ***other*** aspects of the SUSMP to hillside homes, applying the .75 numerical design standard will result in an unreasonable, and in many instances, an unworkable standard without any benefit to the quality of our urban runoff. Most single family homes slope towards the street, with small front yards and two or three car driveways. Requiring compliance with the .75 standard for individual homes will in most all cases be economically and/or physically impossible. Unlike larger developments, where a designated amount of open space (at significant cost) can be planned and carved out of otherwise developable space, complying with the .75 design standard for most individual single family homes, will be impracticable, if not impossible, as there will be insufficient space on individual lots to capture .75 inches of rainfall over a 24 hour period.

Further, the distinction between a hillside home in comparison to a non-hillside home, ***after*** grading, is insignificant and/or non-existent, as most homes are built on level graded pads.[3] To impose the .75 standing on individual ***hillside*** homes will truly result in a one-size fits all standard without giving any meaningful consideration to the impact of the requirement on

[3] The March 8, 2000, Regional Board SUSMP defines "hillside" to mean "property located in an area with known erosive soil conditions, where the development contemplates grading on any natural slope that is twenty-five percent or greater."

individual homeowners, or the limited, if any, benefits to be obtained from such a requirement.

In light of the lack of any evidence on the need to apply the .75 design standard to single family hillside homes, and the impracticability of applying the standard, both economically and practicably, Petitioners respectfully request that the .75 standard not apply to the development of individual single family hillside homes.

IV. A STATE WIDE STORMWATER QUALITY TASK FORCE SHOULD BE CREATED.

As is apparent from the evidence submitted at the time of the hearing on the storm water programs of other states throughout the Country, the development of an efficient and effective storm water program, specifically including appropriate numerical limitations, is an evolving process, requiring significant deliberation and collaboration among all interested stakeholders.

The lessons learned from programs in other states such as Florida, Maryland and Washington show that not only is the constitution of an effective storm water program an evolving process, it is a process that should be handled state-wide through a collective and collaborative task force, whose primary purpose is to assist in developing a storm water runoff program that meets the needs of the citizens of the state, while at the same time remaining flexible enough to address the varying urban runoff problems. Programs may differ from region to region, depending on the level of rainfall, the type of development, the existing and proposed landscape, the pollutants of concern and sources of those pollutants, the proximity to ground water and the impacts on the quality of the ground water, vector concerns, and various other variables.

Admittedly, California has a long road to travel before it can be satisfied with the quality of its urban runoff, and a successful storm water program will only be achieved after due consideration is provided to interested stakeholders, specifically including representatives of the parties who will be implementing the programs, i.e., the various Permittees, as well as the Southern California Association of Governments, city planners, public works directors, the building industry, and the representative environmental organizations and other interested stakeholders. Necessary issues to be addressed by a Statewide Task Force include the application of the .75 standard to the various types of developments, whether a single standard should be

applied to all developments or whether various design standards should be derived, whether the .75 standard is the appropriate standard and whether it should be modified on a watershed basis, whether the costs of implementing the .75 standard are justified in light of the expected benefits, and whether the benefits to surface water quality outweigh the potential adverse impacts from this standard or any other standard on the quality of our groundwater. The Task Force should be given specific target dates to complete specific studies, and should be asked to provide input on regional solutions, funding mechanisms, and alternative BMPs. The Task Force should also evaluate the likely costs and benefits of implementing a numerical design standard, including the economic impacts on lower income communities throughout the State.

Accordingly, Petitioners respectfully request that the Draft Order be revised to form a State-Wide Task Force as outlined above, and to include a recommendation to the State Legislature to make funds available to further the work of the Task Force, so that our existing storm water quality problems are not addressed in a microcosm, but are addressed statewide and resolved through a deliberative and collaborative process.

V. THE TERM "NEW DEVELOPMENT" SHOULD BE REVISED TO BE CONSISTENT WITH THE STATE BOARD'S REVISION OF THE DEFINITION OF "REDEVELOPMENT".

In the Draft Order, the State Board recognizes the need for changes to the definition of "Redevelopment" given the over breadth and ambiguity with Respondents' definition. That the term "Redevelopment" was in need of revision was apparent from the evidence submitted at the time of the hearing, as well as the various post-hearing submissions, ***all*** requesting that the term be revised. The State Board's revisions to the definition of "Redevelopment" are thus necessary and appropriate modifications and should remain without revision.

However, many of the same ambiguities and concerns created by the overbroad and ambiguous definition of "Redevelopment" also exist with Respondents' definition of "New Development." Specifically, the term "New Development" is broadly defined to include ***"land disturbing activities; structural development, including construction or installation of a building or structure, creation of impervious surfaces; and land subdivision."*** (Final SUSMP, p. 4.) As

discussed in Petitioners' post-hearing brief, it was, in part, this broad and ambiguous definition of "New Development" that led to some of the concerns expressed by the Petitioners at the time of the hearing that the Regional Board's SUSMP would lead to absurd results. One example provided at the hearing was development in an existing SUSMP category (such as a single family "hillside" home or a home located in an environmental sensitive area), where a new porch or some other "impervious surface" was to be added. Under the Respondents' SUSMP, where a new porch is added to a single family hillside home, this "New Development" non-discretionary project could have been read as triggering a SUSMP for the entire site.

Clearly, "New Development" must mean something other than "land disturbing activities or the creation of impervious surfaces," and the term should be revised to be consistent with the eight development categories set forth in the State Board's Draft Order. Petitioners purpose that the term "New Development" be revised to read as follows:

> **"New Development" means land disturbing activities, structural development and/or land subdivision resulting in the development of one of the eight project categories listed above, i.e., a single-family hillside residence, a 100,000 square foot commercial development, an automotive repair shop, a retail gasoline outlet, a restaurant, a home subdivision with 10-99 units, a home subdivision with 100 or more housing units or a Parking Lot."**[4]

Petitioners respectfully request that the term "New Development" be revised as set forth above and in Attachment A hereto, to give meaning to the revised definition of "Redevelopment" and to be consistent with the other provisions of the Final SUSMP, as well as to avoid the over breadth and ambiguity discussed above and at the time of the hearing.

VI. THE FINDINGS IN THE STATE BOARD'S DRAFT ORDER HIGHLIGHT THE NEED FOR FURTHER MODIFICATIONS TO THE SUSMP TO COMPLY WITH THE REQUIREMENTS OF WATER CODE SECTION 13360.

In finding that the .75 numerical standard was appropriate, the State Board, in the Draft Order, found that the numerical standards were "design standards" to be utilized as "objective

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[4] It should be recognized that although Petitioners have identified a "single family hillside residence" as being included within a definition of new development, Petitioners do not believe that the .75 numerical standard should be applied to such a development category. Rather, only the remaining portions of the SUSMP and the BMPs set forth therein should be applicable.

criteria that developers must achieve in ***designing*** their BMPs." (Draft Order, p. 12.) The State Board further determined that "the only significant difference between the two versions of the SUSMPs is that the Regional Board established numerical criteria for ***designing*** the BMPs." (Id.)[5]

Pursuant to California Water Code Section 13360(a), "[n]o waste discharge requirement or other order of a regional board or the state board or decree of a court issued under this division shall specify the ***design,*** location, type of construction, or ***particular manner*** in which compliance may be had with that requirement, order, or decree, and the person so ordered shall be permitted to comply with the order in any lawful manner." (Cal. Water Code § 13360(a).)

The State Board's recognition that the .75 design standard is a ***design*** standard that "developers must achieve in developing their BMPs" is a finding which proves the Regional Board was specifying the "***design***" or "***particular manner***" in which "compliance" was to be had in order to comply with the SUSMP. The Regional Board's imposition of the .75 standard, combined with the State Board's finding that this numerical design standard was in fact a standard that project proponents "***must achieve in designing their BMPs***" flies directly in the face of the prohibition set forth under Water Code Section 13360(a).

Instead of a specific .75 standard for the ***design*** of BMPs, to comply with the requirements of Section 13360 of the California Water Code, the Regional Board and State Board should set forth a general standard in accordance with the "maximum extent practicable" guideline provided by the Clean Water Act. (33 U.S.C. § 1342(p)(3).) Specifying a design standard by which BMPs are to be constructed, rather than requiring compliance with a general standard clearly violates the basic principle of Section 13360 that Permittees are permitted to comply with the Order in any lawful manner and cannot be required to "***design***" their systems in a "***particular manner.***" In short, it is appropriate for the State Board or a Regional Board to identify "the disease and command that it be cured," but under Water Code Section 13360(a), it is inappropriate for the State Board or a Regional Board to "dictate the cure." (*Tahoe Sierra Preservation Council v. State Water Resources Control Board* (1989) 210 Cal.App.3d 1421, 1438.)

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[5] Obviously, there are a number of other differences that exists between the Permitees' SUSMP and Respondents, including the addition of "environmentally sensitive areas," "redevelopment," "non-discretionary projects," and the waiver fee.

Beyond the general "maximum extent practicable" standard set forth in the Clean Water Act, presumably the Respondents could have identified the pollutants of concern and the source of those pollutants along with a list of suggested BMPs. However, imposing a specific numerical "***design***" standard for the BMPs is "dictating the cure" to the Permittees, and is something that the California Legislature has expressly prohibited. (Cal. Water Code § 13360(a).)

In light of the finding of the State Board that the .75 numerical standard is in fact a "design" standard for the BMPs in question, the .75 standard should be deleted from the Final SUSMP, and a general standard, in accordance with the requirements of the Clean Water Act and State law should be devised.

VII. THE STATE BOARD PROPERLY CORRECTED VARIOUS DEFECTS AND DEFICIENCIES WITHIN THE RESPONDENTS' FINAL SUSMP.

A. The State Board's Deletion Of "Environmentally Sensitive Areas" From The SUSMP's "Development Categories" Was Required.

The plain language of the NPDES Permit shows that SUSMPs were only to apply to "development ***categories***" as opposed to "development ***locations***." Further, the Permit expressly envisions the need for Permittees to consider whether a project falls within "environmental sensitive areas and the slope and erosion potential of the site and Part 2, III, surrounding areas," and, if so, the project itself should be reviewed and its potential impact on storm water quality evaluated. (Permit, p. 33) Where a project falls within an "environmentally sensitive area," if urban runoff will adversely impact the environmentally sensitive area (or the environment in general), obviously the project itself will then have to be modified and/or mitigation measures implemented, before the project can be approved. (See California Environmental Quality Act ("CEQA"), Pub. Res. Code § 21000 *et seq.*)

As recognized by the State Board in the Draft Order (see Draft Order, p. 24), developments within "environmentally sensitive areas" are already subject to extensive regulation through other environmental laws, statutes and regulations, and thus imposing additional regulatory requirements pursuant to the SUSMP generally on all developments in such areas, particularly where there is no nexus between what caused the area to be environmentally sensitive and the

stormwater run off, would be arbitrary and capricious.

Whether a development covered by the SUSMP or otherwise falls within an environmentally sensitive area, the impact of the project, under existing California law, pursuant to the California Environmental Quality Act and other environmental statutes, must be evaluated. Accordingly, it would be arbitrary and capricious to include a "location" such as an "environmentally sensitive area" into the "development categories" in which to apply the subject SUSMP.

B. The State Board's Deletion Of "Non-Discretionary" Projects From The SUSMP Was Required In Light Of The Express Language Of The Permit And The Unworkable Application Of The SUSMPs Without Such A Correction.

As set forth in the Draft Order itself, the language of the Permit is very clear that SUSMPs are only to apply to "discretionary" projects. (See Permit, Part 2. III, p. 33, 34 and 36.) Further, as supported by the Administrative Record, it is apparent that even the Respondents did not believe they had the authority to apply the SUSMP to "non-discretionary" approvals. (See 1/25/00 e-mail of Mr. Leon, A.R. Vol 2, Item 19; and Respondents' 12/7/99 Tentative Resolution, Finding 13, stating the SUSMPs were required for "discretionary Priority Project." A.R., Vol 2, Item 2, p. 11-29.)

It is also apparent that Respondents failed to provide adequate notice and an opportunity for the Petitioners to be heard on the issue of applying the SUSMP to "non-discretionary" projects, given that such "non-discretionary" projects were not added until the day of the hearing, and given the confusion expressed even by Respondents on what was meant by "non-discretionary." (See June 8, 2000 Transcripts, p. 47, line 13 - p. 51, line 9.) Moreover, the inclusion of "non-discretionary" projects would have expanded the application of the SUSMP to projects far beyond those envisioned by the Respondents in drafting the SUSMP, and would have led to a number of absurd and unattended applications of the program.[6]

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[6] Examples discussed at the time of the hearing included application of the .75 standard to an entire site as a result of merely installing a new roof at a covered development category, or the construction of a new porch at a single family hillside home or at a home within an environmentally sensitive area.

Respondents' eleventh hour inclusion of "non-discretionary" projects into the SUSMP further highlights the need for a collaborative and deliberative process ***with the Permittees***. It was apparent from the hearing before the State Board that Respondents did not fully appreciate or comprehend the import of applying the SUSMP to "non-discretionary" projects, or what would constitute a "non-discretionary" versus a "discretionary" approval (an issue that is specifically within the expertise of the Permittees and thus an issue in which the Permittees could have and would have willingly provided input and information to the Respondents had the Permittees been given the opportunity). Leaving the Permittees out of this part of the decision-making process, when it is the Permittees that must administer the programs and apply and enforce the SUSMPs throughout their respective jurisdictions, illustrates the importance of following a collaborative process and conferring with the Permittees on all aspects of the SUSMP ***before*** attempting to mandate its terms. Petitioners were denied due process through the inclusion of "non-discretionary" projects into the SUSMP at the eleventh hour, and the State Board's deletion of such "non-discretionary" projects was required as a result of such denial of due process, and as a result of the specific language of the NPDES Permit in issue.

C. The Waiver Fee Proposed By Respondents Was Unworkable And Premature.

As proposed in Respondents' Final SUSMP, a waiver could only be granted upon a finding of "impracticability." Where "impracticability" was found, a Permittee was then ***mandated*** to ***"require the project proponent to transfer the savings in costs, as determined by the Permittee, to a storm water mitigation fund to be used to promote regional or alternative solutions for storm water pollution in the storm watershed and operated by a public agency or a non-profit entity."*** (Final SUSMP, p. 15.) No other guidance was provided on the application, administration or assessment of such a fee.

The requirement that a Permittee collect from the project proponent the same amount of ***"savings in costs"*** would render the waiver provision meaningless in all cases where impracticability was created by economics. Obviously, requiring the same amount in "***savings in costs***" to be paid into a fund, where there has been a finding of impracticability, again illustrates the results of the Respondents' failure to follow a collaborative and deliberative process.

In addition, the waiver fee as written by Respondents, was incomprehensible, as the Regional Board failed to recognize "regional solutions" as alternatives to site-by-site or project-by-project programs, apparently except in cases of impracticability. Thus, under the Respondents' waiver fee provision, "regional solutions" could never be realized unless a ***series of projects*** in the region were found to be impracticable. Otherwise, the so-called "regional solution" would be meaningless, as it would be nothing other than a single off-site detention basin for the particular project determined to be "impracticable." Thus, Respondents' waiver fee, at best, would have lead to an inefficient and underutilized regional alternative, and, at worst, would have resulted in an insurmountable roadblock to the proposed development in issue.

The State Board's deletion of the "waiver funding requirement" was necessary given the poor drafting of the requirement and the lack of thoughtful evaluation by the Regional Board. Petitioners herein, however, would support the creation of a waiver fund, created at the Permittee's individual discretion within the respective jurisdictions, and working with the County and other cities within the respective watersheds, to develop sensible regional alternatives to the existing proposed site-by-site .75 numerical standard.

D. <u>The Exclusion Of "Retail Gasoline Outlets" From The .75 Numerical Standard Was Appropriate.</u>

Significant health and safety concerns were created by the inclusion of Retail Gasoline Outlets within the SUSMP, and particularly the required application of the .75 numerical standard to such developments. At the time of the hearing on June 7 and June 8, Petitioner the Western States Petroleum Association, submitted detailed evidence that Retail Gasoline Outlets are already heavily regulated and that the California Best Practices Management Guide for Retail Gasoline Outlets (March 1997) does not recommend or impose numerical standards on such facilities.

Respondents failed to submit substantial evidence to refute the evidence submitted by WSPA, and nor did Respondents submit sufficient evidence to show that the health and safety concerns created by the imposition of the .75 standard were outweighed by any marginal benefit to be obtained by application of the .75 standard to Retail Gasoline Outlets.

VIII. CONCLUSION.

The Respondents' SUSMP was adopted and imposed on the Permittees through a flawed Administrative Process. Particularly, Respondents failed to follow the deliberative and collaborative process envisioned under the NPDES Permit through the Permit's meet and confer process and through the Permit's requirement that the Permittees, rather than the Respondents, prepare the final SUSMP. Accordingly, Respondents acted contrary to the terms of the Permit and State and federal law by imposing the SUSMP on the Permittees, and by failing to consider sound science and the pollutants of concern and the sources of those pollutants from particular development categories.

In addition, both the Regional Board and the State Board failed to properly consider and apply the requirements of the Administrative Procedures Act (Gov. Code § 11340 *et seq.*), the California Constitutional Prohibition on Unfounded Mandates (Cal. Const. Art. XIII B § 6), the requirements of the California Environmental Quality Act (Pub. Res. Code § 21000 *et seq.*), the entirety of the cost/benefit requirements provided for under both State and federal law, as well as the requirements of Cal. Water Code Section 13360 on specific design standards. In short, the proposed SUSMP, even with the revisions proposed by the State Board, is both scientifically and legally deficient and should have been overturned in its entirety.

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Petitioners respectfully request that, at a minimum, the State Board's Draft Order be modified in accordance with the above discussion and Attachment A hereto, including the incorporation of regional solutions as an express alternative to the site-by-site project-by-project programs, the exemption of low/moderate income housing projects and single family hillside homes, the creation of a State Wide Task Force to further study and address the issues in question, and the revision of the definition of "New Development" to be consistent with the covered projects in the SUSMP. Petitioners respectfully reserve their rights to further challenge any aspect of the State Board's Order and/or the Respondents' proposed SUSMP that remain in violation of the Clean Water Act, the Porter Cologne Act, and other applicable provisions of State and federal law.

Dated: September 27, 2000

Respectfully submitted

RUTAN & TUCKER LLP
RICHARD MONTEVIDEO
TERENCE J. GALLAGHER

By: _____
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Attorneys for Petitioners

ATTACHMENT A

ADDITIONAL PROPOSED AMENDMENTS TO SUSMPS

[These amendments are to the final SUSMP, as published March 8, 2000, and are being proposed **in addition** to the State Board's Proposed Amendments dated August 10, 2000]

Page 4 of 25

Revise definition of "New Development":

"New Development" means land disturbing activities, structural development and/or land subdivision resulting in the development of one of the eight project categories listed above, i.e., a single-family hillside residence, a 100,000 square foot commercial development, an automotive repair shop, a retail gasoline outlet, a restaurant, a home subdivision with 10-99 units, a home subdivision with 100 or more units, or a Parking Lot.

Page 10 of 25

Add to "Limited Exclusion": Single family hillside homes and Low/Moderate Income Housing Projects.

Page 10 of 25

Add a second paragraph to the "Limited Exclusion Section" to read as follows:

The project applicant may comply with the numerical Structural or Treatment Control BMP design standard by utilizing proximate or regional Structural or Treatment Control BMPs as alternatives to site-by-site or project-by-project BMPs.

PROOF OF SERVICE BY MAIL

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over the age of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fourteenth Floor, Costa Mesa, California 92626-1998.

On September 27, 2000, I served on interested parties in said action the within:

PETITIONERS' WRITTEN COMMENTS TO AUGUST 24, 2000 DRAFT ORDER OF THE STATE WATER RESOURCES CONTROL BOARD

by placing a true copy thereof in sealed envelope(s) addressed as stated on the attached mailing list.

I am readily familiar with this firm's practice of collection and processing correspondence for mailing. Under that practice it would be deposited with the U.S. postal service on that same day in the ordinary course of business. I am aware that on motion of party served, service is presumed invalid if postal cancellation date or postage meter date is more than 1 day after date of deposit for mailing in affidavit.

Executed on September 27, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Janet Bechtel
(Type or print name)

Janet Bechtel
(Signature)

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74689.01 a09/19/00

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Attorneys for Petitioners

Fax to Jorge
cc: KS
pls rtn

PETITION BEFORE THE

STATE WATER RESOURCES CONTROL BOARD

THE CITIES OF BELLFLOWER, BELL GARDENS, BURBANK, CERRITOS, COMMERCE, COMPTON, DIAMOND BAR, DOWNEY, HAWAIIAN GARDENS, HUNTINGTON PARK, INDUSTRY, IRWINDALE, LA CANADA-FLINTRIDGE, LA MIRADA, LA VERNE, LAKEWOOD, LAWNDALE, MONROVIA, MONTEBELLO, PALOS VERDES ESTATES, PARAMOUNT, PICO RIVERA, POMONA, RANCHO PALOS VERDES, ROSEMEAD, SAN GABRIEL, SANTA FE SPRINGS, SIGNAL HILL, SOUTH GATE, VERNON, WALNUT, AND WHITTIER, municipal corporations; and THE BUILDING INDUSTRY ASSOCIATION OF SOUTHERN CALIFORNIA, a Non-Profit Mutual Benefit Corporation, and THE BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION, a Non-Profit Mutual Benefit Corporation, Petitioners, vs. THE CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD, LOS ANGELES REGION; and DENNIS DICKERSON, Executive Director of the Los Angeles Regional Water Quality Control Board, Respondents.	Case No. A-1280, A-1280(a) a[illegible]1280(b) PETITIONERS' OBJECTION[illegible] REGIONAL BOARD'S REFERENCE TO [illegible]A RECORD EVIDENCE IN REGIONAL [illegible]D'S SEPTEMBER 27, 2000 WRIT[illegible] COMMENTS

I. INTRODUCTION.

Petitioners respectfully object to extra record evidence referred to by the [illegible]nal Board in its written comments of September 27, 2000 on the State Board's Draft Order. B[illegible]r dated August 28, 2000, the State Board provided all parties, including the Regional Bo[illegible]n opportunity to comment on the Draft Order. However, in this same letter, the Sta[illegible]ard indicated it had already conducted a hearing on the matter and that ***"evidence rel[illegible]to this matter will not be heard at the meeting or accepted before the meeting."*** In va[illegible]ocations throughout its written comments on the Draft Order, the Regional Board improp[illegible]ted evidence ***not in the record*** in an attempt to convince the State Board to change it[illegible]rminations in the Draft Order.

As the State Board indicated that additional evidence would not be heard [illegible] meeting or ***"accepted before the meeting,"*** Petitioners respectfully request that such extra r[illegible]evidence cited by the Regional Board, not be considered and that all such comments by th[illegible]ional Board be stricken.

II. THE REGIONAL BOARD'S EXTRA RECORD EVIDENCE REGA[illegible]NG RETAIL GASOLINE OUTLETS SHOULD BE STRICKEN.

For reasons that are unclear, the Regional Board, on line 21 of page 5 of t[illegible]EGIONAL BOARD COMMENT ON PROPOSED ORDER" (hereafter "Regional Board's C[illegible]ents") contended that there are "3,500 operating RGOs in Los Angeles County." Simil[illegible]n page 5, footnote 11, the Regional Board referred to a database it maintains on leaking un[illegible]ound storage tanks. While ignoring the potential problems and risks to our groundwater quali[illegible]ated by its SUSMP and its goal of having less impervious space (apparently even for RGOs[illegible] Regional Board refers to its records on leaking underground tanks and the number of gaso[illegible]cations currently operational in Los Angeles County, all of which is evidence not in the [illegible]nistrative Record. ***Petitioners respectfully request that such reference to evidence not in[illegible]ecord be stricken.***

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III. THE REGIONAL BOARD CITES SEVERAL REFERENCES TO E NCE CONCERNING ENVIRONMENTALLY SENSITIVE AREAS THA ST BE STRICKEN, AS SUCH EVIDENCE IS NOT IDENTIFIED ANYWH IN THE RECORD.

The Regional Board starts its argument by admitting that Environmentall sitive Areas ("ESAs") are "locational" rather than "developmental" and that the inclusion of E n the SUSMP present "some difficulty in application." (Regional Board Comments p. es 16-18.) Unfortunately, the Regional Board's argument continues with references to the C Long Beach MS4 Permit without any reference to the record as to where this documen introduced into evidence during these proceedings.[1] It also references the inclusion of the V a County MS4 Permit, which it claims was adopted on ***July 27, 2000***, a document plainly evidence in these proceedings. (Regional Board Comments, p. 7, lines 1-4, and p. 8, lines 7-

Similarly, while attempting to make the argument that other agencies dea ESAs differently, referring specifically to the California Coastal Commission admini he California Coastal Act, and referring to an MOU apparently entered into betwee State Board and the Coastal Commission, as well as Coastal Commission determinations in J y 2000 and August 2000, the Regional Board in effect makes the State Board's argument tha s are already highly regulated in California. Unfortunately, all of these statements sh e stricken since in making its arguments, the Regional Board relies upon extra record evid ot permitted to be introduced in such written comments and thus inappropriately included as of the record that is before the State Board. (See Regional Board Comments, page 7, l through page 8, line 1, where the Regional Board improperly refers to the MOU with the tal Commission, as well as the January 2000 and August 2000 meetings of the Coa ommission.)

Similarly, the references to the Long Beach Permit and the Ventura Cou mit should be stricken from the record in issue unless the Regional Board can identify whe e Record

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[1] The Regional Board contends the Long Beach Permit was introduced into e e at the June 8 hearing, but the parties were not provided copies of the Permit at the time, and egional Board has failed to identify where in the Record the Long Beach Permit itself w itted into evidence, and if so, through whose testimony.

these documents were introduced into evidence. (See Regional Board Comments [redacted] lines 1-4 and p. 8, lines 7-11.)

IV. THE REGIONAL BOARD REFERS TO EVIDENCE IN THE COU[redacted]OF ITS ARGUMENT ON 'NONDISRETIONARY PROJECTS' THAT MUS[redacted] STRICKEN.

Finally, in making its argument that "nondiscretionary" projects should b[redacted]uded within the subject SUSMP (irrespective of the express language in the NPDES Permit t[redacted]ontrary and its prior admissions to the contrary), the Regional Board argues it recently "adop[redacted]e Ventura County MS4 Permit (Board Order No. 00-108) without any reference to the term[redacted]etionary' therein." (Regional Board Comments, p. 9, lines 19-20). The Regional Board ap[redacted]tly included "nondiscretionary projects" in the SUSMP in Ventura County and seeks to convi[redacted]e State Board that because it did so in connection with the Ventura County Permit, that [redacted]ate Board should rest assured it will do so again with respect to the Los Angeles County Pe[redacted] The Regional Board is apparently intent on applying the SUSMP in Los Angeles Cou[redacted]o "nondiscretionary projects," irrespective of what the evidence may show in the c[redacted] of the hearing process on the new permit, and the propriety or impropriety of doing the[redacted]. The argument does not change the lack of opportunity provided to the Petitioners to [redacted]ss this issue at the hearing on January 26, 2000, and nor does it change the express language [redacted] Permit itself, which does not allow for the inclusion of "nondiscretionary" projects with[redacted] SUSMP. More importantly, the argument is inappropriate, as the Regional Board is referr[redacted] extra record evidence; i.e., the adoption of the Ventura County Permit, which must be stricke[redacted]n the Regional Board's written comments. (See Regional Board Comments, p. 9, line[redacted]0.)

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V. CONCLUSION.

For the foregoing reasons, Petitioners herein respectfully request that the record evidence referenced and relied upon by the Regional Board in its written comme[illegible]n the State Board's Draft Order be stricken in its entirety, as it violates the admonishment p[illegible]d by the State Board in its August 28, 2000 directive.

Dated: October 4, 2000

Respectfully submitted

RUTAN & TUCKER LLP
RICHARD MONTEVIDEO
TERENCE J. GALLAGHER

By: [signature]
RICHARD MONTEVIDE[illegible]
Attorneys for Petitioners

PROOF OF SERVICE VIA TELECOPY

STATE OF CALIFORNIA)
) ss.:
COUNTY OF ORANGE)

I am employed in the County of Orange, State of California. I am over th[redacted] of 18 and not a party to the within action. My business address is 611 Anton Boulevard, Fo[redacted]nth Floor, Costa Mesa, California 92626-1998.

On October 4, 2000, I served on interested parties in said action the withi[redacted]

PETITIONERS' OBJECTIONS TO REGIONAL BOARD'S REFERENC[redacted] EXTRA RECORD EVIDENCE IN REGIONAL BOARD'S SEPTEMBER 27, 2000 WRI[redacted]N COMMENTS

by transmitting a true copy of said document from facsimile machine whc[redacted]ephone number is 714-546-9035, pursuant to California Rules of Court, Rule 2005. The[redacted]mile machine I used complied with Rule 2003(3) and no error was reported by the ma[redacted] Pursuant to Rule 2008(e), I caused the machine to print a record of the transmission, a cop[redacted]hich is attached to this declaration. Said fax transmission occurred as stated in the trans[redacted]n record attached hereto. Said fax transmission was directed as stated below.

Executed on October 4, 2000, at Costa Mesa, California.

I declare under penalty of perjury under the laws of the State of Californi[redacted] the foregoing is true and correct.

Helen Davis
(Type or print name)

Helen Dall[redacted]
(Signature[redacted])

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March 8, 2000

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John Robertus, Executive Officer
California Regional Water Quality Control Board
San Diego Region
9771 Clairemont Mesa Blvd.
San Diego, CA 92124

Dear Mr. Robertus:

PROPOSED NUMERIC SIZING CRITERIA FOR POST-CONSTRUCTION BMPS

The following comments are submitted for public testimony at the Regional Board's March 8, 2000 *Public Workshop on Numeric Sizing Criteria for Post-Construction BMPs for New and Re-Development.*

The County of San Diego has reviewed the Regional Board's February 25, 2000 Staff Report and March 6, 2000 Supplemental Staff Report regarding the proposed requirement of numeric sizing criteria for post-construction Best Management Practices (BMPs). Like other municipal stormwater co-permittees, we strongly support the reasonable application of appropriate stormwater quality controls, which are consistent with federal NPDES stormwater permitting regulations and the State Water Code. As such, we are conceptually open to the use of numeric sizing criteria for specified categories of development and redevelopment activities, but believe that the establishment of these or other specific criteria by the Regional Board would constitute an intrusion into local government authority and responsibility. Furthermore, we have a number of concerns about these criteria as they are currently proposed by Regional Board staff.

A. Legal and Regulatory Basis for SUSMP and Numeric Sizing Criteria

The County questions, and after further analysis may contest in an appropriate forum, the assertion in the Staff Report that "[t]he Regional Board has the authority to require the proposed Standard Urban Storm Water Mitigation Plan (SUSMP) and numerical sizing criteria for new construction and significant redevelopment post-construction BMPs." The County's concerns and objections in this area are related to the specificity of the requirements staff proposes to impose. Therefore, a decision to mandate specific numeric criteria would increase the seriousness of the County's concern.

1. Mandating Municipal Imposition of SUSMPs and Numeric Criteria

Staff's analysis claims authority for the Regional Board that is so broad and unguided that the specific provisions of 40 CFR 122.26(d)(2)(iv)(2) would lose any importance as limitations on the Regional Board's power over municipal governments. This is not what Congress or the state legislature intended, and it is not what the Courts have ratified in the cases cited by staff.

The Regional Board may well have the regulatory authority to directly require selected dischargers to capture stormwater to the degree staff suggests.[1] But that authority does not imply that the Regional Board also has the authority to force municipalities, as political and regulatory entities, to impose those requirements on others by ordinance or in permits.

The clearest and most directly applicable statement of the Regional Board's (delegated) power in this area is that contained in 40 CFR 122.26(d)(2)(iv)(2). That language (subject to requirements concerning unfunded mandates, discussed below) empowers the Regional Board to require municipal dischargers to utilize planning procedures including a master plan to develop controls. It requires that such plans address post-construction controls to reduce pollutants in discharges from storm sewers.

Staff's proposal contrasts sharply. Staff has not proposed a requirement concerning planning procedures or master plans, but a requirement to include specific numerical requirements in a municipal ordinance or municipal permits. Staff has not proposed a requirement concerning pollutants coming from municipal storm drains, but a requirement that would (purportedly) make municipalities accountable for specific industrial, commercial and residential discharges to those drains. The Regional Board lacks authority to force municipalities to impose such requirements. It also lacks authority to make municipalities liable under the Clean Water Act or the State Water Code for discharges by other entities to its storm drains.

The Board should also be mindful that staff's proposal would effectively impose important new requirements on dischargers without an environmental review process, without an appropriate rulemaking process and without consideration of the actual costs and benefits of the proposed requirements for any specific project. Foregoing these disciplines has emboldened staff to propose requirements that are far more stringent than those contained in the state's own general stormwater permits, which are applicable to industrial facilities and construction projects.

Staff's proposal is also so specific that it violates the prohibition in State Water Code section 13360 against specifying the manner of compliance with a waste discharge requirement.

The Regional Board has authority over the County as a discharger of stormwater, but that is a limited regulatory authority. The Regional Board should be guided in the exercise of that authority by 40 CFR 122.26(d)(2)(iv)(2), and should issue a revised municipal permit that requires and allows the County to address post construction controls in its planning process and

[1] If the Board has this authority, it comes with responsibilities. (Cf., Supplemental Information report at page 8, second bullet.) If acting directly, the Regional Board would confront its legal responsibilities to support findings with evidence, to follow mandated procedures when issuing rules, to determine and consider a full range of environmental impacts and alternatives and to provide due process when issuing permits. The Board would also, to an attenuated degree, confront some basic political and regulatory responsibilities (e.g., to accept responsibility for the requirements it mandated and to find the resources and fortitude to enforce those requirements).

general plan. It should not attempt to dictate the shape of County regulatory programs with the degree of specificity staff has proposed.

The case law discussed by staff does not establish that the Regional Board has authority to require municipalities to conduct themselves as staff has proposed.

NRDC v. *U.S. EPA* (1992) 966 F.2d 1292, 1308 ("NRDC II") was a challenge to an EPA rulemaking. There was no issue in that case of state authority to impose requirements on municipalities as political and governmental entities. Moreover, the principal holding in that case was that EPA was required to conform its regulations to the statute Congress had enacted. Thus, EPA could not limit the scope of the statutory program, or defer statutory deadlines. EPA's decision not to set specific minimum standards or numerical criteria in its regulations was upheld, however.

Staff would use this case, which upheld and preserved flexibility, as a justification for staff recommendations that would destroy municipalities' land use planning and stormwater management flexibility.

Nor does *Defenders of Wildlife* v. *Browner* (1999) 191 F.3d 1159 provide the mandate for SUSMPs and numeric sizing criteria that staff suggests. The question the court addressed in depth in its opinion was whether the court could compel EPA to require municipal stormwater dischargers to comply with state water quality standards, after EPA had chosen not to impose that requirement. The court refused to compel such requirements, finding that Congress drew a clear distinction between mandatory requirements for industrial dischargers and for municipal stormwater dischargers. "[T]he statute unambiguously demonstrates that Congress did not require municipal storm-sewer dischargers to comply strictly with 33 U.S.C. sec. 1311(b)(1)(C) [i.e., state water quality standards]." (*Id.* at 1165.) While the court also stated that EPA could impose such requirements if it determined they were necessary (*Id.* at 1166), the holding in the case and the thrust of the opinion was that permits which imposed only BMP requirements were legally adequate.

Significantly, there was no discussion in this case of the scope of EPA or state authority to dictate to municipalities the specific scope and terms of municipal stormwater regulatory programs. Absent a discussion of this issue, the case is not authority on the issue of what the Regional Board can compel the County to do. Staff, nevertheless, cite the case as a mandate for their proposed intrusions on municipal prerogatives.

2. Unfunded Mandates

Article 13B, Sec. 6 of the California Constitution provides that no state agency may mandate a new program or a higher level of service by a local government unless the state provides a subvention of funds to reimburse that local government for the costs of such program or higher level of service. The purpose of this provision is to prevent the state from forcing programs on local government. (*City of Richmond* v. *Commission on State Mandates* (1998) 64 Cal.App.4th 1190.) A Regional Board decision to require municipalities to implement a new and specific regulatory program, for the categories of sources identified in staff's proposal, would clearly be a state mandate, despite the arguable nexus to the Clean Water Act. (*Hayes* v. *Commission on State Mandates* (1992) 11 Cal.App.4th 1564.)

Staff's proposed impositions upon the County are an unfunded mandate prohibited by the state constitution, which the County will not accept.

3. Other Requirements of Doubtful Legality

The County is also concerned that the Regional Board lacks authority to require the County to impose other specific requirements proposed by staff.

First, the Regional Board lacks authority to require the County to regulate peak flow discharges of stormwater to protect stream banks and prevent flooding. These are important goals but they are not issues of stormwater pollution over which the Regional Board has jurisdiction, much less authority that supersedes County authority. *PUD No. 1* v. *Washington Department of Ecology* (1994) 511 U.S. 700, cited by staff, does not give the Regional Board this authority. Instead, that case held that under section 401 of the Clean Water Act (not 402) the state could establish minimum flows (not maximum flows) when approving a dam (not a municipal stormwater discharge) in order to protect formally established beneficial uses of the dammed stream. Moreover, the case held that even in these circumstances state authority was circumscribed: it could only impose requirements to ensure compliance with "applicable effluent limitations and other appropriate state law requirements." No such nexus exists to support the flow limitation requirement staff proposes to impose.

Second, the County believes the Regional Board lacks authority, at least on this record, to require the County to require dischargers to identify an entity with perpetual responsibility for BMP maintenance and an assured source of funding. No authority is offered for this proposed imposition, and the staff materials make no serious attempt to demonstrate the proposed imposition is necessary to keep pollutants out of stormwater. This suggested requirement is also presumptively unreasonable, given the low costs staff attributes to BMP maintenance, the high cost of entity formation and formal financial assurance mechanisms and the availability of other means to ensure that BMPs are maintained. It is unlikely staff would be proposing this requirement if they were the ones who would be required to explain it, impose it and enforce it in the real world.

Third, the County believes the Regional Board lacks authority to limit the County's discretion concerning stormwater capture only to cases in which the Regional Board determines that such capture is impracticable. If authority and responsibility are linked, the County should have the authority to manage and implement programs for which it is responsible. Staff's suggestion that the Regional Board retain a veto over flexibility and discretion in a program that staff proposes be forced onto municipalities, is unacceptable to the County.

Finally, the County is not aware of any Regional Board authority to require in lieu fees as proposed by staff. Staff identifies no authority for this proposal.

4. Failure To Perform Proper CEQA Analysis

The County asserts that the Regional Board cannot take the actions proposed by staff because no environmental review has been conducted to support such action as required by the California Environmental Quality Act ("CEQA"). (Pub. Resources Code, § 21000 et seq.) The County anticipates that the proposed actions would cause significant environmental impacts, some of which are noted below. Moving forward without even identifying those impacts would be irresponsible.

a. The Regional Board Will Be Asked To Approve a Project

CEQA requires that a public agency perform environmental review prior to determining whether or not to approve a project that may have significant impacts on the environment. (Pub. Resources Code, § 21080.) CEQA Guidelines (Cal. Code Regs., tit. 14, § 15000 et seq.) define an approval as a decision that commits the public to a definite course of action on its project. (Cal. Code Regs., tit. 14, § 15352.) Staff states on page 3 of the Supplemental Information for Public Workshop:

> "At the conclusion of the Workshop, the SDRWQCB will vote to include, or not to include, numeric sizing criteria in the upcoming municipal storm water permit."

If the Regional Board votes to include numeric sizing criteria in the upcoming municipal permit, it will constitute an "approval" under CEQA and will trigger the requirement to have the necessary environmental review to support the approval. No environmental review has been performed to support this action.

b. The Regional Board Must Comply With CEQA

The reports prepared by staff make no mention of CEQA or the need to satisfy its requirements prior to taking the staff's proposed action. The County can only speculate that staff has either failed to recognize that CEQA compliance is required or is relying upon Water Code section 13389 (Regional Board not required to comply with CEQA when adopting waste discharge requirements, except requirements for new sources, as defined by federal law). Such reliance would be misplaced for two reasons. First, the actions being proposed by staff are not required by federal law and, therefore, Water Code section 13389 is not applicable to the proposed actions. (Water Code, § 13372; *Committee for a Progressive Gilroy* v. *State Water Resources Control Bd.* (1987) 192 Cal.App.3d 847.) Second, even if federal law required the proposed actions, the waste discharge requirements that would be proposed for adoption would be requirements for new sources. Therefore, the Regional Board would be required by the specific terms of Water Code section 13389, to comply with CEQA.

c. Public Policy Demands That The Regional Board Satisfy CEQA

Legal arguments aside, the Regional Board must not move forward with staff's proposed actions until staff has studied all of the environmental impacts that may be forthcoming.

Also, the Regional Board must complete the CEQA process prior to deciding to implement numeric sizing criteria in order to assure that the co-permittees will be able to comply with the requirements. The co-permittees will be required to comply with CEQA prior to imposing the type of restrictions contemplated by staff. If the Regional Board has not completed the CEQA process and considered all of the potential impacts of the proposed actions prior to their adoption, the co-permittees are likely to find that CEQA demands some modifications of the proposed actions that will be inconsistent with the Regional Board's requirements. However, once the Regional Board has completed the CEQA process and addressed the environmental concerns, the co-permittees will be able to rely upon this documentation when they are forced to implement the program.

B. Implementation Issues

In addition to the legal and regulatory issues already cited, Regional Board staff have failed to adequately consider the full range of potential issues and problems associated with implementation of the proposed criteria.

1. Costs

It is the County's belief, without having had an opportunity to fully study this item, that the costs presented by Board staff are inadequately explored and may be significantly underestimated. Staff have cited a figure of 0.7% of total project cost as a typical high-end implementation cost. However, it is unclear whether this analysis incorporates stormwater treatment costs, entity formation and financial assurance mechanism costs, or all relevant maintenance costs. Moreover, even if this figure is accurate for this scenario, it is misleading since it relies on the assumption that the total project and land costs for a 5.51 acre, $6.5 million warehouse project will be typical of the projects that would be subject to the proposed criteria. Many urban projects will present different ratios of project value, land value and stormwater capture costs. In particular, the last minute inclusion by staff of two additional project categories ("locations adjacent to or discharging to an environmentally sensitive area" and "exposed parking lots > 5,000 square feet or with > 25 spaces") virtually assures that numerous smaller projects would be subject to these requirements. These projects would likely bear proportionally greater costs.

To accurately assess the financial impacts of BMP installation and maintenance, it is necessary to carefully consider a wide range of factors. Staff's analysis appears to have only partially addressed such costs. These should be fully explored in a public forum prior to the consideration of numeric sizing criteria, even conceptually, by the Regional Board.

2. Flexibility

Flexibility in the application of permit requirements is key to program success since the blanket requirement of rigid performance criteria over broad and inflexible categories of development could effectively prohibit development in many areas (e.g., sites where percolation is poor and large areas are not available to infiltrate, filter, or treat runoff). Additionally, the retention of water in open areas or catchment basins is likely to result in other problems, such as mosquito-breeding or the creation of artificial wetlands, an issue of serious concern since it could result in requirements to comply with additional environmental regulations. It is incumbent on Regional Board staff to provide adequate flexibility in its permitting process to allow local municipalities to avoid these and other potential problems.

The Supplemental Staff Report states that "[a] provision is included to allow affected parties to develop their own sizing or performance criteria using alternative approaches" and that, "upon approval by the SDRWQCB," these would replace the interim proposed criteria. Yet no such provision is contained in any of the materials provided. However, the report does go on to state that if alternative criteria are not proposed and approved, the interim criteria will become permanent. This raises serious concerns about Board intrusion into local decision making, an intrusion which would eliminate the flexibility needed by municipalities to implement effective development planning programs. While staff are very careful to state that the issue before the Board is not the consideration of specific numeric criteria, it is abundantly clear that upon conceptual approval, they intend to establish such criteria and to retain complete control over their application. It is of little comfort that they intend to do so in a public forum.

3. Effectiveness and Cost-Effectiveness

Ultimately, the practices implemented under this permit should enhance the co-permittees' ability to meet existing discharge requirements and to improve the quality of local receiving waters. It is currently unclear whether the proposed criteria would accomplish this. Staff's proposal relies on the critical assumption that increased retention of stormwater flows will reduce pollutant loadings, and therefore improve water quality. Yet, no data substantiating these assumptions are provided in either of the reports.

Staff assertion that this proposal would be "cost effective" is not supported by analysis. Staff characterize their initial[2] selection of the 85th percentile, 24-hour runoff event as "the point of diminishing returns, i.e., the BMP capacity beyond which, insignificant increase in pollutant removal (and hence water quality protection) will occur, relative to the additional costs." However, while this proposed criterion would likely ensure the capture of the majority of runoff, it in no way establishes a relationship to pollutant reduction or, more importantly, to the achievement of specific water quality objectives. It only states an assumption that such a relationship exists. It is incumbent on Regional Board staff both to provide an effectiveness analysis which demonstrates such a nexus and to determine how changes in stormwater capture requirements would affect both the costs of capture and the discharge of pollutants.

In conclusion, the County is extremely concerned about the lack of opportunity provided to review these reports prior to the RWQCB's March 8 Workshop. The March 2, 2000 release of the RWQCB's original Staff Report and subsequent March 6, 2000 release of the Supplemental Report have allowed County staff four and two working days, respectively, to review and respond to these documents. Additionally, this has occurred in a period during which Board Staff were fully aware that nearly identical criteria proposed by the Los Angeles Regional Board were under appeal.

We urge the Regional Board to reject staff's current proposal to include numeric sizing criteria in its revised municipal stormwater permit. The establishment of such criteria is most appropriately left to local jurisdictions. Further, it is recommended that Board staff work cooperatively with affected parties to determine an approach which allows municipalities to retain an appropriate level of local control and does not unfairly burden the development industry. Given the potential significance of the proposed requirements, any other approach would be irresponsible and would likely be subject to appeal.

Sincerely,

ROBERT R. COPPER
Deputy Chief Administrative Officer

RRC/jp

[2] This 85th percentile figure is misleading because staff subsequently apply a safety factor of 2. The effective percentile for this proposal is therefore substantially higher than 85.