

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION  
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**FACT SHEET**

FOR

**ALAMEDA COUNTYWIDE CLEAN WATER PROGRAM**  
TENTATIVE ORDER AMENDING NPDES PERMIT No. CAS0029831

and

**FAIRFIELD-SUISUN URBAN RUNOFF MANAGEMENT PROGRAM**  
TENTATIVE ORDER AMENDING NPDES PERMIT No. CAS612005

and

**SAN MATEO STORMWATER POLLUTION PREVENTION PROGRAM**  
TENTATIVE ORDER AMENDING NPDES PERMIT No. CAS0029912

**PUBLIC NOTICE:**

Written Comments

- Interested persons are invited to submit written comments concerning these Tentative Orders.
- Comments must be received by the Water Board no later than 5:00 p.m. on January 28, 2007.
- Send comments to the ATTN: Jan O'Hara, or via email to [johara@waterboards.ca.gov](mailto:johara@waterboards.ca.gov)

Public Hearing

- These Tentative Orders will be considered for adoption by the Board at a public hearing during the Board's monthly meeting at: Elihu Harris State Office Building, 1515 Clay Street, Oakland, CA; 1<sup>st</sup> floor Auditorium.
- This meeting will be held on: **March 14, 2007**, starting at **9:00 am**.

Additional Information

- For additional information about this matter, interested persons should contact Water Board staff member: Ms. Jan O'Hara, phone: (510) 622-5681; email: [johara@waterboards.ca.gov](mailto:johara@waterboards.ca.gov)

This Fact Sheet contains information regarding proposed amendments of three National Pollutant Discharge Elimination System (NPDES) permits for the three municipal stormwater programs listed above. The Fact Sheet describes the factual, legal, and methodological basis for the Tentative Orders and provides supporting documentation.

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**I. INTRODUCTION**

The Board has issued NPDES municipal stormwater permits to the following Programs: Alameda Countywide Clean Water Program (ACCWP), Fairfield-Suisun Urban Runoff Management Program (FSURMP), and San Mateo Stormwater Pollution Prevention Program (SMSTOPPP). The Permittees (municipalities and agencies) that comprise each Program are listed in the Tentative Orders. Each

Permittee has jurisdiction over and/or maintenance responsibility for its respective municipal separate storm drain systems and/or watercourses.

Each Program's permit contains the requirement, at Provision C.3.f., to submit a Hydrograph Modification Management Plan (HMP) for managing increases in peak runoff flow and increased runoff volume from certain new and redevelopment projects where such increases are likely to cause increased erosion of creek beds and banks, silt pollutant generation, or other impacts to beneficial uses. Each Program has submitted its HMP as required.<sup>1</sup> These Tentative Orders would amend each Program's permit by approving key provisions of each Program's HMP.

## II. BACKGROUND INFORMATION

During urban development important changes occur to the landscape. Natural vegetated pervious ground cover is converted to impervious surfaces such as paved highways, streets, rooftops, and parking lots. Because rain water cannot infiltrate into these impervious surfaces, the runoff leaving a developed urban area tends to be significantly greater in volume, velocity and pollutant load than pre-development runoff from the same area.

The increased flows and volumes of stormwater discharged from impervious surfaces resulting from new and redevelopment can significantly impact beneficial uses of aquatic ecosystems due to physical modifications of watercourses, such as bank erosion and widening of channels. A number of studies have demonstrated a direct correlation between the degree of imperviousness of an area and the degradation of beneficial uses of downstream watercourses. Significant declines in the biological integrity and physical habitat of streams and other receiving waters have been found to occur with as little as a 10% conversion from natural to impervious surfaces. Typical medium-density single-family home projects developed in previously unurbanized locations, range between 25 to 60% impervious.

Even at very low densities, such as 1-2 housing units per acre, some types of subdivisions built in previously unurbanized locations can result in more than a 10% increase in imperviousness.<sup>2</sup> Studies on the impacts of imperviousness on beneficial uses of waters include "Urbanization of aquatic systems: Degradation thresholds, stormwater detection, and the limits of mitigation," Derek B. Booth and C. Rhett Jackson, *Journal of the American Water Resources Association* 33(5), Oct. 1997, pp. 1077-1089; "Urbanization and Stream Quality Impairment," Richard D. Klein, *Water Resources Bulletin* 15(4), Aug. 1979, pp. 948-963; "Stream channel enlargement due to urbanization," Thomas R. Hammer, *Water Resources Research* 8(6), Dec. 1972, pp. 1530- 1540; and, summaries of work on the impacts of imperviousness, including "The Importance of Imperviousness," in *Watershed Protection Techniques* 1(3), Fall 1994, pp. 100-111, and "Impervious surface coverage: The

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<sup>1</sup> For ACCWP: *Draft Hydrograph Modification Management Plan, Parts A and B*, prepared by the Alameda County Public Works Agency, November 15, 2004. Available at

[http://www.cleanwaterprogram.org/uploads/ACCWP\\_HMP\\_PartA\\_5-15-05.pdf](http://www.cleanwaterprogram.org/uploads/ACCWP_HMP_PartA_5-15-05.pdf) .

For FSURMP: *Hydromodification Management Plan for the Fairfield-Suisun Urban Runoff Management Program*, prepared by Balance Hydrologics, Inc. and GeoSyntec Consultants, April 2006. <http://www.fssd.com>

For SMSTOPPP: *Hydromodification Management Plan*, San Mateo Countywide Stormwater Pollution Prevention Program, May 12, 2005. Available at

<http://www.flowstobay.org/pdfs/New%20Development/HMP%20Report%20Final.pdf>

<sup>2</sup>A discussion of imperviousness based on type of development and time of construction is provided in Heaney, J.B., Pitt, R, and Field, R. **Innovative Urban Wet-Weather Flow Management Systems**, 1999. USEPA Doc. No. EPA/600/R-99/029 (Chapter 2).

emergence of a key environmental indicator,” Chester L. Arnold et al., *Journal of the American Planning Association* 62(2), Spring 1996, pp. 243-259.

Increases in flows from impervious surfaces associated with urbanization can have the following effects, which are referred to hydromodification impacts:<sup>3</sup>

- Increases in the number of bankfull events and increased peak flow rates in downstream watercourses;
- Sedimentation and increased sediment transport in downstream watercourses;
- More frequent flooding;
- Stream bed scouring and habitat degradation;
- Stream channel widening and shoreline erosion, including threats to infrastructure (e.g., bridges, utility line crossings, and adjacent roads) and existing structures (e.g., homes, businesses, fences, etc.);
- Decreased stream baseflow;
- Aesthetic degradation; and,
- Changes in stream morphology.

The purpose of these Tentative Orders is to take steps to keep these hydromodification effects from getting significantly worse than their present-day condition, by requiring certain new and redevelopment projects to control runoff flows and durations to their current level.

### III. GENERAL RATIONALE

#### 1. Water Quality Control Plan, San Francisco Bay Basin, November 16, 2005 (Basin Plan).

The Urban Runoff Management, Comprehensive Control Program section of the Basin Plan requires the Permittees to address existing water quality problems and prevent new problems associated with urban runoff through the development and implementation of a comprehensive control program focused on reducing current levels of pollutant loading to storm drains to the maximum extent practicable. The Basin Plan comprehensive program requirements are designed to be consistent with federal regulations (40 CFR 122-124) and are implemented through issuance of NPDES permits to owners and operators of storm drain systems. The Permittees, having jurisdiction over and/or maintenance responsibility for municipally-owned and operated storm drains and water courses within their boundaries, have assumed responsibility for complying with the Basin Plan’s requirements. Their permits recognize submittal of the Management Plan as the

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<sup>3</sup> Selected references reviewed for this section include:

“The Importance of Imperviousness,” in *Watershed Protection Techniques* 1(3). p.100-111.

Booth, Derek B., June 1990. “Stream Channel Incision Following Drainage-Basin Urbanization,” Paper No. 89098, *Water Resources Bulletin* 26(3), p.407-417.

Brown, Kenneth B., “Housing Density and Urban Land Use as Indicators of Stream Quality,” in *Watershed Protection Techniques* 2(4). p.735-739.

Hollis, G.E., 1975. “The Effect of Urbanization on Floods of Different Recurrence Interval,” *Water Resources Research* (1975). p. 431-435.

Klein, Richard D., August 1979. “Urbanization and Stream Quality Impairment,” Paper No. 78091, *Water Resources Bulletin* 15(4), p.948-963.

U.S. Environmental Protection Agency, 1999. Preliminary Data Summary of Urban Storm Water Best Management Practices. EPA-821-R-99-012. p.4-24 to 4-26.

Washington State Department of Ecology, August 2000. Stormwater Management Manual for Western Washington (Final Draft), Publication 99-11. Volumes 1 and III.

Permittees' Comprehensive Control Program and require implementation of the Management Plan.

2. The Basin Plan identifies the beneficial uses of waters and establishes water quality objectives necessary to protect these beneficial uses which apply to certain receiving waters within the Permittees' boundaries. These water quality objectives serve as receiving water limitations for waters that receive discharges of pollutants.
3. Pursuant to the State Board's "Statement of Policy with Respect to Maintaining High Quality of Waters in California" known as the Antidegradation Policy (SWRCB Resolution 68-16), existing high quality waters must be maintained. Under the Antidegradation Policy, changes in water quality must:
  - Be consistent with maximum benefit to the people of the State;
  - Not unreasonably affect present and anticipated beneficial uses of water; and,
  - Not result in water quality less than that prescribed in water quality control plans or policies.
4. The Federal Water Pollution Control Act (Clean Water Act) as amended by the Water Quality Act of 1987 (hereinafter CWA) Section 402(p) requires municipalities of 100,000 population or greater which have discharges from municipal separate storm sewer systems to obtain NPDES permit coverage for these discharges. Permits are also required for discharges that are determined to contribute to a violation of a water quality standard (objective) or are a significant contributor of pollutants. Section 402(p) provides that permits may be issued on a system-wide basis, shall include a requirement effectively prohibiting non-stormwater discharges to storm sewers, and shall require controls to reduce the discharge of pollutants to the maximum extent practicable. The United States Environmental Protection Agency (hereinafter US EPA) promulgated regulations on November 16, 1990 on NPDES permit application requirements including the development of stormwater management programs for municipal stormwater discharges.
5. Federal Code of Regulations, Title 40 – Protection of Environment, Chapter 1, Environmental Protection Agency, Subchapter D, Water Programs, Parts 122-125 (hereinafter referred to as 40 CFR specific Part number) contain promulgated regulations pertaining to the NPDES application permit conditions and program requirements.

#### IV. SPECIFIC RATIONALE

##### 1. Hydromodification Requirements

Several sections of the CWA and implementing federal regulations pertain to requirements that Municipal Separate Storm Sewer Systems (MS4) dischargers control stormwater discharges from new development and redevelopment. Requirements in the Tentative Orders address, in part, compliance with those requirements.

**CWA 402(p)(3)(B)(iii) – Require Controls:** The CWA requires in section 402(p)(3)(B)(iii) that a stormwater program "shall require controls to reduce the discharge of pollutants to the maximum extent practicable (MEP), including management practices, control techniques and system, design and engineering methods, and such other provisions as the Administrator or the State determines appropriate for the control of such pollutants."

**CWA 402(p)(6) – Municipal Stormwater Discharges – Regulations:** The CWA requires in section 402(p)(6) that the EPA's program to regulate stormwater discharges, at a minimum, shall

establish priorities, requirements for State stormwater management programs, and expeditious deadlines, and “...may include performance standards, guidelines, guidance, and management practices and treatment controls, as appropriate.”

**40 CFR 122.26(d)(2)(iv)(A)(2) – Enforce Controls on New Development and Significant Redevelopment:** Federal NPDES regulations have required since 1990 that dischargers utilize “planning procedures including a master plan to develop, implement and enforce controls to reduce the discharge of pollutants from [MS4s] which receive discharges from areas of new development and significant redevelopment.”

The measures in the Tentative Orders are intended to comply with the Clean Water Act Section 402(p) MEP standard and the continuous improvement process for performance standards and management measures envisioned by the Clean Water Act as permit cycles progress. They are a logical continuation and improvement of effective measures in the existing Permit, based on shortcomings identified and knowledge gained from implementation of measures to date. The hydromodification control requirements are based on a sound technical base of information and designed to maximize effectiveness based on the present state of knowledge, including knowledge of implementation in other jurisdictions. Additionally, the requirements are technically and economically feasible. The measures have been implemented by municipalities in other states, and the measures have been demonstrated to help address the associated impacts.

2. Permit Amendment Provision and Limitations

The existing permits anticipated that permit amendments would be necessary from time to time to respond to changed conditions and to incorporate more effective approaches to pollutant control. These Orders are consistent with the provision entitled “Modifications to this Order” of the existing permits.

Pursuant to 40 CFR Sections 124.5(c)(2) and 122.62, only those conditions to be modified by these amendments shall be reopened with these amendments. All other aspects of the existing permits shall remain in effect and are not subject to modification by these amendments.

**V. COMPARISON OF THE THREE TENTATIVE ORDERS**

The Tentative Orders for ACCWP, FSURMP and SMSTOPPP are very similar. The Tentative Orders have essentially the same requirements for each Program and Permittee, except where local conditions allow for variation. The table below summarizes the Tentative Orders.

Tentative Order Section	ACCWP Tentative Order	FSURMP Tentative Order	SMSTOPPP Tentative Order
Revises existing Order #	R2-2003-0021	R2-2003-0034	99-059
C.3.f.i. Implementation Date	Implementation begins 90 days after adoption of the Tentative Order		
C.3.f.ii Hydromodification Management (HM) Standard	Same hydromodification standard for all		
C.3.f.iii HM Control Areas	Each Program has delineated an area on a map, with supporting text, where the HM Standard applies. Maps are shown in Attachment A of each Tentative Order.		
C.3.f.iv. Applicable Projects	Same requirement for all		
C.3.f.v. Redevelopment Projects	Same requirement for all		
C.3.f.vi. Types of HM	Each Program may use on-site control measures, regional control		

Tentative Order Section	ACCWP Tentative Order	FSURMP Tentative Order	SMSTOPPP Tentative Order
Controls	measures, in-stream measures, or a combination thereof.		
C.3.f.vii. On-site & Regional Control Design Criteria	Each Program has the same design criteria, with the exceptions described below:		
Range of Flows to Control	10% of 2 year peak flow to 10 peak flow: based on data from Santa Clara County streams	20% of 2 year peak flow to 10 peak flow: based on data from Laurel and Ledge wood Creeks	10% of 2 year peak flow to 10 peak flow: based on data from Santa Clara County streams
Allowable Low Flow Rate	10% of 2 year peak flow: based on data from Santa Clara County streams	20% of 2 year peak flow: based on data from Laurel and Ledge wood Creeks	10% of 2 year peak flow: based on data from Santa Clara County streams
Standard HM modeling	ACCWP, SMSTOPPP, and SCVURPPP <sup>4</sup> each contributed to the development of the Bay Area Hydrology Model (BAHM) for modeling and designing HM controls. Other stormwater programs may allow use of the BAHM only where the project proponent can demonstrate that site-specific data are used as model inputs.		
Sizing Charts	Not applicable	FSURMP developed sizing charts to aid in the sizing and design of HM controls. Project proponents may use these charts after the sizes are increased to properly reflect the allowable low flow rate of 20% of 2 yr. peak flow AND the increases are approved by the Executive Officer.	Not applicable
C.3.f.viii. In-stream Measures Design Criteria	Same requirement for all		
C.3.f.ix. Impracticability Provision	Same requirement for all		
C.3.f.x. Record Keeping	Same requirement for all		

<sup>4</sup> The Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) contributed to the development of the Bay Area Hydrology Model (BAHM). SCVURPPP’s permit was amended to include interim hydromodification management requirements in July, 2005. When SCVURPPP’s permit is reissued in the near future, it will contain more permanent hydromodification management requirements.