



Jeremy  
Harris

NATURAL RESOURCES DEFENSE COUNCIL

January 24, 2008

Via electronic mail and U.S. mail

Executive Officer and Members of the Board  
California Regional Water Quality Control Board, San Diego Region  
9174 Sky Park Court, Suite 100  
San Diego, CA 92123

**Re: Revised Tentative Order No. R9-2008-0001, NPDES Order No. CAS0108740**

Dear Mr. Robertus and Members of the Board:

The Natural Resources Defense Council (NRDC) is a national environmental organization with over 675,000 members, more than 124,000 of whom are California residents. Defend the Bay is a not-for-profit public interest organization dedicated to protecting Newport Bay and regional waters as well as the health of the people that live in and enjoy the irreplaceable natural resources of the region. NRDC and Defend the Bay have reviewed the second revised draft NDPES Municipal Regional Stormwater Permit (Draft Permit) for the South Orange County region, released on December 12, 2007, and submit the following comments regarding the critical issue of controlling polluted runoff.

As a general matter, protecting the abundant and exceptional water resources in South Orange County requires, first, a municipal storm water permit that actually imposes specific controls to the maximum extent practicable (MEP) and assures compliance with water quality standards. Second, more specifically, protection of the area's beneficial uses requires adequate, ascertainable controls on runoff rate, volume, and quality from new and redevelopment projects. This Draft Permit accomplishes neither requirement. Instead, a majority of the provisions of the Draft Permit are vague and general prescriptions that offer the Regional Board and the public no assurance that controls that meet the MEP standard and water quality standards will be implemented. In fact, there is in critical respects a complete absence of specific controls in the Draft Permit. Because of this overriding flaw, the Draft Permit should be substantially revised before it is issued.

**I. Introduction and Summary**

**A. South Orange County Contains Exceptional Natural Resources and is Quickly Developing.**

The inadequacies of the Draft Permit threaten to degrade some of the highest quality natural watersheds left in California. According to Dr. Paul Beier of Northern Arizona University:

Doc Scanned On: 1/24/08  
S. Bourche Time: 1:207

It has long been my opinion that this area [South Orange County] stands in a class by itself as our ONLY opportunity to conserve a large, unfragmented, ecologically intact portion of southern California's coastal ecosystems. The regional and global significance of this area cannot be overstated.

(Friends of the Foothills, "A Global Diversity Hotspot.")<sup>1</sup> South Orange County includes some of the "world's rarest habitat." (*Id.*) "Numerous scientific studies have identified south-coastal California as a hotspot for species diversity, endemism, endangerment, and conservation priority." (*Id.*) Orange County "retains an impressive flora and fauna, . . . significant populations of rare and endangered species of plants, birds, and mammals, . . . over half the remaining population of coastal cactus wrens, and [] over 15% of the remaining population of the California gnatcatcher." (Bryant, P., *Natural History of Orange County, California.*)<sup>2</sup> Moreover, the "southern part of the County still includes large, relatively undeveloped sections of coastal sage scrub habitat," (*id.*), and more than 50,000 acres of open space near the Irvine Ranch. (Craig Reem, *Irvine Ranch Gift: The Irvine Co. sets aside another 11,000 acres of open space*, OC METRO.)<sup>3</sup>

South Orange County also includes the Heisler Park Ecological Reserve Area of Special Biological Significance (ASBS), and the southern portion of the Irvine Coast Marine Life Refuge ASBS. (See SWRCB, *Areas of Special Biological Significance.*)<sup>4</sup> The concept of "special biological significance" recognizes that "certain biological communities, because of their value or fragility, deserve very special protection that consists of preservation and maintenance of natural water quality conditions." (SWRCB, ASBS Status Report (Aug. 2006), at 10.)<sup>5</sup> Both ASBSs in South Orange County are negatively affected by urban runoff. (*Id.* at 65-66.) In fact, the "source of inputs to the Irvine Coast ASBS is largely from the newly developed urban watershed." (*Id.* at 66.) But the southern portion of the ASBS drains a region of still "largely undeveloped natural habitat." (*Id.*) This experience clearly demonstrates the importance of regulatory measures that anticipate and try to prevent negative effects of urban development on sensitive water bodies. Finally, in addition to the ASBSs, the San Juan Hydrologic Unit includes water bodies that support the Rare, Threatened, or Endangered Species (RARE) and Spawning, Reproduction, and/or Early Development (SPWN) beneficial uses. (Water Quality Control Plan for the San Diego Basin

---

<sup>1</sup> Available at [http://taskforce.sierraclub.org/friendsofthefoothills/issues/issues\\_05.html](http://taskforce.sierraclub.org/friendsofthefoothills/issues/issues_05.html). All articles and reports, except for those produced by the Regional Board or State Water Board, cited to in this comment letter have been submitted to the Board either in hard copy or on a compact disk. Where also available on the internet, we have provided the link.

<sup>2</sup> Available at <http://mamba.bio.uci.edu/~pjbryant/biodiv/index.htm>.

<sup>3</sup> Available at [http://www.irvinecompany.com/aboutus/in\\_the\\_news/gift\\_article/index.asp](http://www.irvinecompany.com/aboutus/in_the_news/gift_article/index.asp).

<sup>4</sup> Available at [http://www.swrcb.ca.gov/plnspols/docs/asbs\\_info/asbs\\_swqpa\\_publication03.doc](http://www.swrcb.ca.gov/plnspols/docs/asbs_info/asbs_swqpa_publication03.doc).

<sup>5</sup> Available at [http://www.swrcb.ca.gov/plnspols/docs/asbs/status\\_report\\_aug06.pdf](http://www.swrcb.ca.gov/plnspols/docs/asbs/status_report_aug06.pdf).

9 (Basin Plan), at 2-17 - 2- 21.)<sup>6</sup> The RARE beneficial use “includes uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.” (*Id.* at 2-7.) The SPWN beneficial use “includes uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.” (*Id.*) The existence of these beneficial uses, among others, further highlights the importance of protecting South Orange County’s water resources.

Due to the “availability of large tracts of vacant land for development in the South Orange County submarket,” the region experiences a “more rapid rate of increase [in housing inventory].” (U.S. Dept. of Housing and Urban Development, *Analysis of the Orange County, California, Housing Market* (Jan. 1, 2004), at 7.)<sup>7</sup> 14,000 new housing units are planned for construction on 23,000 acres of previously undeveloped land (the Rancho Mission Viejo project), and a 4,000 home subdivision is planned near Irvine Ranch.<sup>8</sup> It is also projected that more than 35,000 housing units will be added in Orange County between 2005 and 2035. (Center for Demographic Research, Orange County Profiles, *Orange County Projections 2006: Population, Housing and Employment Through 2035* (March 2007).)<sup>9</sup>

This development threatens the region’s unique natural and water resources. The natural communities that are subject to potential development pressure include, but are not limited to, coastal sage and other sage scrub communities, chaparral, woodland and forest, riparian, wetlands, and native and annual grasslands. (County of Orange, Draft NCCP/MSA/HCP Joint Programmatic EIR/EIS (July 2006), at ES-4.)<sup>10</sup> “In view of the huge rate of destruction of natural habitats in the County, we are probably losing countless species of less conspicuous animals and plants before they are even documented.” (Bryant, P., *Natural History of Orange County, California*.) Thus, the region’s unique natural resources and growth rate patterns highlight the importance of minimizing hydrological impacts via a better development planning section of the Draft Permit.

---

<sup>6</sup> Available at <http://www.waterboards.ca.gov/sandiego/programs/basinplan.html>.

<sup>7</sup> Available at <http://www.huduser.org/Publications/PDF/OrangeCtyCACComp-2.pdf>.

<sup>8</sup> Rancho Mission Viejo, “The Ranch Plan,” available at <http://www.ranchomissionviejo.com/ranchplan/faqs.php>; The Irvine Company, “East of Orange,” available at <http://www.eastoforange.com/news/faqs.asp>.

<sup>9</sup> Available at <http://www.fullerton.edu/cdr/profilesv12n1.pdf>.

<sup>10</sup> Available at [http://www.ocplanning.net/docs/ssnccp/EIR-EIS/nccp\\_eir\\_executive\\_summary.pdf](http://www.ocplanning.net/docs/ssnccp/EIR-EIS/nccp_eir_executive_summary.pdf).

**B. The Failure of the Draft Permit to Contain Specific Controls Generally, and Specifically with Respect to New and Redevelopment, Will Not Protect Water Resources.**

Most stormwater runoff is the result of man-made hydrologic modifications that typically accompany development. (EPA, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices* (Dec. 2007), at 1.)<sup>11</sup> When natural pervious ground cover is converted to impervious surfaces such as paved highways, streets, and rooftops, the natural infiltration capabilities of the land are lost. (Fact Sheet/Technical Report for Tentative Order No. R9-2008-0001 (Fact Sheet), at 30.) Therefore, runoff leaving a developed area is significantly greater in volume, velocity, and peak flow than pre-development runoff leaving the same area. (*Id.*) For example, increases in watershed imperviousness of only 9-22% can result in peak flow rate increases for a two-year storm event of up to 100%. (*Id.* at 99.) These effects of hydromodification are already evident in South Orange County. (*Id.*)

Increased runoff flow picks up proportionally higher levels of car wastes, pesticides, pet wastes, and trash, and carries them to receiving waters, resulting in significant water quality problems. (Fact Sheet, at 30.) This runoff continues to present a significant hurdle to attainment of water quality standards. Indeed, Board staff recognizes that, “[U]rban runoff discharges are causing or contributing to water quality impairments, and are a leading cause of such impairments in Orange County.” (Fact Sheet, at 28; *see also id.* at 10, 29.) Specifically, discharges from MS4s routinely exceed water quality objectives. (*Id.* at 28.) Persistent exceedances of water quality objectives exist in “most” watersheds and conditions are “frequently toxic to aquatic life.” (*Id.* at 10.)

While the overriding vagueness of the Draft Permit infects many of its provisions, the lack of conditions to control runoff rate and volume is particularly glaring. Achieving these goals “will require the use of site design approaches and LID that will limit stormwater generation and maximize natural hydrologic processes for treatment.” (Low Impact Development Center, *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption* (Dec. 2007), at 22.) While the Draft Permit contains some of these concepts, it does not translate the concepts into objective performance standards or actual controls that meet the MEP standard and that otherwise will assure compliance with water quality standards. Specifically, the following objective criteria represent the MEP standard and must be included in the Permit:

- A standard of 3% maximum allowable Effective Impervious Area (EIA) in all Priority Development Projects;

---

<sup>11</sup> Available at <http://www.epa.gov/owow/nps/lid/costs07/documents/reducingstormwatercosts.pdf>.

- A hydromodification standard that post-development peak flow rates and volumes shall not exceed the modeled peak flow rates and volumes with pre-European settlement native land cover for all storms from the channel-forming event to the 100-year frequency stream flow.

## **II. The Draft Permit's Site Design and Low Impact Development Provisions are Vague and Indefinite.**

Taken as a whole, the Draft Permit's provisions regarding site design sets forth general concepts that do not specify the level of control required, contrary to law. Provisions applicable to development generally are set forth in conceptual terms and do not make clear when, if, or how they must be implemented. For example, the Draft Permit requires "site design BMPs where feasible . . . ." (Draft Permit ¶ D.1.c.(2); *see also id.* at ¶ D.1.c.(3) ("buffer zones for natural water bodies, where feasible").) Even with respect to what the Draft Permit describes as "Priority Development Categories," provisions are likewise vaguely stated: "collectively minimize directly connected impervious areas, limit loss of infiltration capacity, and protect areas that provide important water quality benefits." (Draft Permit ¶ D.1.d.(4)(a).) Other provisions list site design BMPs for Priority Development Categories, such as to minimize disturbance of natural drainages, conserve natural areas, protect slopes and channels, and minimize the impervious footprint of the project. (Draft Permit ¶ D.1.d.(4)(c).) However, these BMPs are also only required "where applicable and feasible." (*Id.*)

As explained below, this language cannot ensure that the MEP standard or water quality standards are met and does not constitute the "control" measures required by law.

### **A. The Draft Permit's Site Design Requirements Cannot Be Considered "Best Management Practices" Under the Clean Water Act.**

40 C.F.R. § 122.2 defines the term best management practice as:

Schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States."

The words "practice" and "procedure" both connote a specific method or means of action, rather than an indefinite act. By contrast, the list of site design requirements in Section D.1.d.(4) fail to describe specific actions or procedures. For example, the Draft Permit states that site design requirements must be implemented which "collectively minimize directly connected impervious areas, limit loss of infiltration capacity, and protect areas that provide important water quality benefits." (Draft Permit ¶ D.1.d.(4)(a).) And, for instance, Priority Development Projects must infiltrate "at least a portion" of impervious areas prior to discharge to the MS4. (Draft Permit ¶ D.1.d.(4)(b)(ii).) This language fails to adequately articulate the act required by each Copermitttee to prevent or reduce pollution to waters of the

United States. As such, the requirements set forth in the Draft Permit do not meet the definition of a "BMP" pursuant to federal regulations. Rather, as is often the case, the Draft Permit, at most, sets forth ideas around which a proposed management program, and articulated BMPs, could be developed, as is required in the *application* for an MS4 permit required by federal regulations. (See 40 C.F.R. § 122.26.) Missing are the actual BMPs required in a NPDES permit.

EPA guidance unambiguously reinforces the conclusion that BMP design under the NPDES permit program requires that measurable goals "that quantify the progress of program implementation and the performance of your BMPs," be included for each BMP to be implemented. (EPA, *Measurable Goals Guidance for Phase II Small MS4s: Part 2. Process for Developing Measurable Goals Under a General Permit.*)<sup>12</sup> Generally "considerable deference" must be extended "to an administrative agency's interpretation of its own regulations," and so the EPA guidance interpreting the requirements of NPDES permits "is entitled to great weight unless unauthorized or clearly erroneous." (*Communities for a Better Environment v. State Water Resources Control Board*, 109 Cal.App.4th 1089, 1107 (2003).) EPA "strongly recommends" that, among other components, measurable goals include "a quantifiable target to measure progress toward achieving the activity or BMP." (EPA, *Measurable Goals Guidance for Phase II Small MS4s: Part 2. Process for Developing Measurable Goals Under a General Permit.*) This requirement for quantifiable BMP targets is further clarified in the examples of BMPs and associated measurable goals given by EPA. These examples clearly demonstrate that the development provisions in the Draft Permit are impermissibly vague:

**BMP:** Reduce directly connected impervious surfaces in new developments and redevelopment projects by requiring that grassed swales or filter strips be installed along roadsides in lieu of curbs and gutters.

**Measurable Goal:** Directly connected impervious road surfaces in new developments and redevelopment areas will be reduced by 30 percent (relative to the traditional scenario in which curbs and gutters are used) over the course of the first permit term.

**BMP:** Incorporate the use of road salt alternatives for roadway deicing

**Measurable Goals:** During the 1st year, reduce the amount of road salt applied to roadways by 50% through the use of less-toxic alternatives, such as liquid calcium magnesium acetate (CMA).

(EPA, *Phase II BMP & Measurable Goal Examples.*)<sup>13</sup>

<sup>12</sup> Available at <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/part2.cfm>.

<sup>13</sup> Available at <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/ex5.cfm>; <http://cfpub.epa.gov/npdes/stormwater/measurablegoals/ex6.cfm>.

In each of these cases, EPA requires that a clear performance standard be linked with an activity to constitute an adequately described BMP.<sup>14</sup> However, in the case of the site design requirements, there is no measurable goal, no means of assessing BMP performance or progress, and no means of determining whether the BMP has achieved its purpose. As a result, the vaguely worded provisions in the Draft Permit fail to meet BMP regulations and requirements and are invalid under the Clean Water Act.

**B. Site Design Requirements Do Not Meet the Federally-Required Maximum Extent Practicable (MEP) Standard.**

**I. As a Matter of Law, the Site Design Requirements Do Not and Cannot Meet the MEP Standard.**

Substituting vagaries for BMPs in the Draft Permit itself runs directly contrary to the regulatory requirement that the Regional Board, after reviewing the permit application, actually set forth the “develop[ed] permit conditions to reduce pollutants in discharges to the maximum extent practicable.” (40 C.F.R. § 122.26(d)(iv).) Because the Draft Permit fails to do so in most cases, it consequently does not comply with a mandatory statutory obligation that every permit issued to a municipal discharger “shall require *controls* to reduce the discharge of pollutant to the maximum extent practicable. . . .” (33 U.S.C. § 1342(p)(3)(B)(iii) (emphasis added).) Findings to the contrary are not supported by evidence, and therefore are erroneous and contrary to law.

Indeed, even if it were presumed for the sake of argument that the Draft Permit’s provisions did constitute best management practices, these indefinite, conceptual provisions preclude a determination that the “BMPs” at issue further constitute actual “controls” calibrated to the MEP standard. The open-ended provisions in the Draft Permit’s development planning section escape assessment by Regional Board members entirely, as neither the Draft Permit nor the underlying record make reasonably clear what actions are required and to what end. They further disprove any assertion that Regional Board staff has carefully reviewed the provisions to ensure compliance with MEP, since no amount of expertise can interpret and evaluate the meaning and impact of open-ended provisions.

The need for specificity is not only made clear by applicable regulatory and statutory provisions but is also underscored in the legislative history of the Clean Water Act:

---

<sup>14</sup> In addition, the Director of the Water Division of EPA Region IX has recently indicated that clear performance standards in MS4 permits are critically important. (See Section III(E), *infra*.) Moreover, the State Water Board has agreed that such specific requirements are appropriate, stating that, “[t]he addition of measurable standards for designing the BMPs provides additional guidance to developers and establishes a clear target for the development of the BMPs.” (SWRCB, Water Quality Order No. 2000-11, at 17.)

These are not permits in the normal sense we expect them to be. *These are actual programs.* These are permits that go far beyond the normal permits we would issue for an industry.

(Remarks of Sen. Stafford, 132 Cong.Rec. S32381 (Oct. 16, 1986) (emphasis added); see also 55 Fed. Reg. 47,990, at 48,038.)

2. The Facts in the Record Demonstrate that Staff Recognize that the Draft Permit's Vagueness is a Fatal Flaw.

Not only does the law require a different approach, but so too does the administrative record, which reflects staff's perspective that vague permit terms such as those in the Draft Permit are flawed and ineffective. Even if the Regional Board possessed the discretion to structure the Draft Permit as it is currently drafted, which it does not (for the reasons set forth *supra* and *infra*), this approach would constitute a gross abuse of discretion and is contrary to the evidence in the record. The Fact Sheet acknowledges that the lack of specificity in earlier permits resulted in "frequently unenforceable permit requirements," and "provided the Copermittees with ample reasons to take few substantive steps towards permit compliance." (Fact Sheet, at 8.) Yet the Draft Permit fails to rectify this problem; it still lacks clarity necessary to ensure MEP.

For example, Priority Development Projects must receive and infiltrate or treat runoff from "at least a portion of impervious areas prior to discharge to the MS4," with the amount to be "based on the total size, soil conditions, slopes, and other pertinent factors of the project." (Draft Permit ¶ D.1.d.(4)(b)(ii).) "At least a portion" only means that each Priority Development Project must filter some part of storm water discharge less than the whole— theoretically, any number from 1% to 99% can meet the standard. As little as one drop of runoff can be treated on-site, while the remaining entirety of runoff at the site is discharged through the MS4 system. The Draft Permit similarly requires that "a portion" of walkways, trails, overflow parking lots, alleys, or other low-traffic areas be constructed with permeable surfaces, again meaning that even if only 1% of low-traffic areas are constructed using permeable surfaces, the Copermittee has achieved Permit compliance. (Draft Permit ¶ D.1.d.(4)(b)(iii).) Similarly, Copermittees are required to "minimize" disturbances to natural drainages, "conserve" natural areas, "protect" slopes and channels, "minimize" soil compaction of permeable soils," and "minimize" the impervious footprint of the project, all without reference to any level of implementation. (Draft Permit ¶ D.1.d.(4)(c).) In short, there is nothing preventing a Copermittee from adopting a *de minimis* reduction that fails to reduce pollutants to the *maximum* extent practicable.

The Draft Permit's finding that it specifies the requirements necessary to reduce the discharge of pollutants to the MEP (Draft Permit Findings, at 7) is further contradicted by other statements and evidence in the record. The Fact Sheet states that the Draft Permit provides the "*minimum* framework to guide the Copermittees in meeting the MEP standard." (Fact Sheet, at 38 (emphasis added).) The Fact Sheet also states that it prescribes "*minimum*

measurable outcomes, while providing the Copermittees with flexibility in the approaches they use to meet those outcomes.” (*Id.* at 12 (emphasis added).) Clearly, this admission that the Draft Permit contains only a *minimum* framework for meeting MEP belies the finding that it sets out controls to reduce pollutants to the *maximum* extent. Moreover, the assertion that the Draft Permit in most instances actually specifies required “measurable outcomes” is wholly unsupported by the record, which proves the opposite is true.

Moreover, evidence does not support the finding stated above that providing Copermittees with “flexibility” will result in achievement of the MEP standard. The first and second term permits, which the Fact Sheet characterizes as having provided Copermittees with the “maximum amount of flexibility” in developing their stormwater programs, resulted in only limited progress toward permit compliance. (*Id.* at 8.) Thus, the current approach of drafting a permit with only minimal guidance, and instead to give Copermittees “flexibility” to meet the MEP standard, is not supported by past experience. This is true generally and specifically with regard to the development portion of the Draft Permit. The Fact Sheet states that the previous permit’s approach, requiring site design BMPs “where applicable and feasible,” did not work. (*Id.* at 91.) The approach proved to be “ineffective in integrating site design BMPs in project designs.” (*Id.*) Yet, the current approach is not much different. While it requires some site design BMPs to be implemented, (Draft Permit ¶ D.1.d.(4)(a-b)), most site design BMPs only need be implemented “where applicable and feasible.” (Draft Permit ¶ D.1.d.(4)(c).)<sup>15</sup>

In sum, the approach in the Draft Permit to site design (and more generally, as set forth in Section IV, *infra*), which is comprised of vague conceptual provisions and the lack of actual controls specified to the maximum extent practicable, mimics the approach that was previously proven ineffective. This approach defers to individual Copermittees the extent to which they must implement BMPs. In this way, the Draft Permit itself does not include a set of controls reflecting the *maximum extent practicable*. (See *Defenders of Wildlife v. Babbitt*, 130 F.Supp.2d 121, 131 (D.D.C. 2001) (phrase “maximum extent practicable” “imposes a clear duty on the agency to fulfill the statutory command to the extent that it is feasible or possible”); *Rybachek v. U.S. EPA*, 904 F.2d 1276, 1289 (9th Cir. 1990) (term “practicable” in CWA has been defined as meaning that technology is required unless the costs are “wholly disproportionate” to pollution reduction benefits).) The Draft Permit’s failure in this regard is particularly egregious given the Fact Sheet’s discussion of how critical site design BMPs are. (See, e.g., Fact Sheet, at 92-93.)

---

<sup>15</sup> The 2002 permit’s description of site design BMPs was also similar for its lack of specificity, requiring project proponent to implement site design/landscape characteristics where feasible which maximize infiltration, provide retention, slow runoff, and minimize impervious land coverage for all development projects. (Order No. R9-2002-R1, at 14.)

**C. Site Design Requirements Will Not Ensure Compliance with Water Quality Standards.**

Pursuant to federal regulations, “no permit may be issued” when “the imposition of conditions cannot *ensure* compliance with the applicable water quality requirements of all affected States.” (40 C.F.R. § 122.4(d) (italics added).) The word “ensure” is defined as “to make certain or sure of.” (Webster’s II New College Dictionary (Houghton Mifflin Co. 1995).) “Certain” is further defined as “definite”; “sure to happen”; and “established beyond question or doubt.” (*Id.*) In other words, permit conditions must make sure, or establish beyond question, that applicable water quality standards will be met.

This requirement applies to the issuance of MS4 permits; the State Water Resources Control Board in a precedential order has determined that municipal storm water permits must prohibit discharges of pollution that cause or contribute to the violation of water quality standards. (*See e.g.*, State Water Resources Control Board WQ Order 2000-11.) As a result, the Draft Permit purports to contain requirements that will “achieve water quality standards” and mandates that “[d]ischarges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.” (Draft Permit ¶ A.3; *Id.* at 7; *see also* Fact Sheet, at 39.)

However, the Draft Permit’s site design requirements (and many other provisions, as further discussed in Section IV, *infra*) are too vague to ensure such compliance, individually or collectively. The administrative record contains no evidence to the contrary. And simple common sense show that the site design requirements fail to ensure or establish beyond a question of doubt that water quality standards will be achieved. For example, given the evidence of widespread water quality standard violations contained in the record, a Copermittee that infiltrates a tiny portion of runoff from impervious areas prior to discharge to the MS4 will still exceed applicable water quality standards—and yet has still complied with the Draft Permit’s requirement to infiltrate a “portion” of runoff. (Draft Permit ¶ D.1.d.(4)(b)(ii).) Other provisions, such as those that condition action based on “feasibility” or employ open-ended terms like “minimize” similarly fail to “make certain of” the fact that water quality standards will be met. (Draft Permit ¶ D.1.d.(4).) In these ways, the Draft Permit’s development-related conditions have not been calculated to protect water quality, nor do they come close to guaranteeing that water quality standards will be satisfied. This deficiency, which extends to many other sections of the Draft Permit, as discussed below, independently violates the CWA. (*See In Re Government of the District of Columbia Municipal Separate Storm Sewer System*, 10 E.A.D. 323, 341-342 (BMPs that are “reasonably capable” of attaining water quality standards do not “appear to be entirely comparable to the concept of *ensuring* compliance”).)

Moreover, the fact that the Draft Permit does not include numeric effluent limitations means that best management practices must meet a higher threshold. (*See Communities for a Better Environment v. State Water Resources Control Board*, 109 Cal.App.4th 1089, 1105

(2003).) Vague provisions cannot be a proper substitute for numerical effluent limits. (*See Arizona Cattle Growers' Ass'n v. U.S. Fish and Wildlife*, 273 F.3d 1229, 1250 (9th Cir. 2001) (“This vague analysis, however, cannot be what Congress contemplated when it anticipated that surrogate indices might be used in place of specific numbers.”).)

**D. To Meet the MEP Standard and Water Quality Standards, the Draft Permit Should Adopt a 3% Maximum Allowable Effective Impervious Area.**

In our August 22, 2007 comment letter to this Board, NRDC and Defend the Bay urged the Board to adopt a standard of 3% maximum allowable Effective Impervious Area (EIA) in all new development and redevelopment projects. Scientific literature demonstrates that significant adverse impacts to the physical habitat and biological integrity of receiving waters occur with the conversion of as little as three percent of natural areas to impervious surfaces. Thus, “[t]o protect biological productivity, physical habitat, and other beneficial uses, effective impervious area should be capped at *no more than three percent*.” (R. Horner, *Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (“LID”) for Ventura County*, Attachment A, at A-1 (emphasis added); see Letter from R. Horner to J. Robertus (Jan. 24, 2008), at 2.) The failure to require this standard means the Draft Permit fails to meet the MEP standard.

A numeric threshold of 3% impervious cover has been noted in studies all over the country as the threshold above which hydromodification and water quality impacts occur. Indeed, adverse effects are already pronounced by the point that impervious cover reaches 5%.<sup>16</sup> (*Id.* at A-2.) For example, studies in the mid-Atlantic area show that changes in the biotic community in streams emerge when impervious surface is greater than about 3% of the watershed area. (Marshall, E. et. al., *Urban development impacts on ecosystems* (2005), at 66.)<sup>17</sup> In Connecticut, it is believed that a fairly low impervious cover level of approximately 3% is “a key reason” why the Eightmile River Watershed is still an intact and functioning watershed ecosystem. (Eight Mile River Watershed Management Plan, at Appendix 9(i) (also noting that other studies find that impervious cover levels as low as 4-5% in a watershed can cause aquatic ecosystems to begin to degrade) (citing U.S. Geological Survey, *The Effects of Urbanization on the Biological, Physical and Chemical Characteristics of*

---

<sup>16</sup> Thus, because other studies may note that degradation of biological integrity has already occurred at higher thresholds, the 3% threshold should be adopted to ensure protection against any such degradation, particularly given the large-scale developments slated to occur in South Orange County’s open spaces. Dr. Horner confirms this point: “Given the unique resources in South Orange County and plans to develop currently open land areas in the region, adoption of an EIA standard that is the most protective of streams in southern California is crucial.” (Letter from R. Horner to J. Robertus (Jan. 24, 2008), at 2-3.)

<sup>17</sup> Available at [http://www.asc.psu.edu/public/pubs/Articles/marshall\\_Chapter%207.pdf](http://www.asc.psu.edu/public/pubs/Articles/marshall_Chapter%207.pdf).

*Coastal New England Streams* (2004)).<sup>18</sup> A study from the Northwest demonstrates that as impervious cover exceeds 3.5%, there is a “significant increase in water level fluctuation, conductivity, fecal coliform bacteria, and total phosphorus in urban wetlands.” (Taylor, B., K. Ludwa, and R. Horner, *Urbanization Effects on Wetland Hydrology and Water Quality: Proceedings of the Third Puget Sound Research Meeting*, Puget Sound Water Quality Authority, Olympia, WA (1995).) A study in the Northeast United States revealed a “threshold potentially existing between 2.4% and 5.1% impervious surface cover.” (Conway, T., *Impervious surface as an indicator of pH and specific conductance in the urbanizing coastal zone of New Jersey, USA*, 85 *Journal of Environmental Management*, 308-316, at 314 (2007).) An Ohio study recorded declining biological integrity at levels of total urban land use as low as 4%, and noted that this result is similar to other studies in North America. (Miltner, R. et al., *Fish Community Response in a Rapidly Suburbanizing Landscape*, at 253-54, presented at EPA conference titled *Urban StormWater: Enhancing Programs at the Local Level* (2003).)<sup>19</sup> Fish and Wildlife studies revealed that drainage areas with impervious cover of greater than 5% may be “detrimental to salamander habitats.” (72 Fed. Reg. 71,040 at 71,045 (Dec. 13, 2007).) In another study, “four species [of aquatic salamanders] were never found in watersheds with more than 3 percent impervious surface.” (Karl Blankenship, *Findings of the Maryland Biological Stream Survey*, Alliance for the Chesapeake Bay, *Bay Journal* (2000).)<sup>20</sup> The Fact Sheet acknowledges this research, stating that, “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 3-5 percent conversion from natural to impervious surfaces.” (Fact Sheet, at 30.)

In addition to studies that demonstrate that the 3% threshold is relevant all over the United States, one study ties a 2-3% threshold specifically to the Draft Permit region.<sup>21</sup> A recent southern California study, acknowledged by the Fact Sheet, “estimated a threshold of response at a two to three percent change in impervious cover in a watershed.” (Coleman, D. et. al., *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams*, SCCWRP Technical Report #450 (2005), at iv; Fact Sheet, at 32.) The threshold is lower for the semi-arid region of southern California than for comparably-sized sites in more humid climates, (*id.*), because southern California streams “appear to be more sensitive to changes in TIMP [total basin impervious cover] than streams in other areas.”<sup>22</sup>

<sup>18</sup> Available at [http://www.eightmileriver.org/resources/digital\\_library/appendicies/09e1\\_mgmt\\_issue\\_3\\_imperv.pdf](http://www.eightmileriver.org/resources/digital_library/appendicies/09e1_mgmt_issue_3_imperv.pdf); <http://pubs.usgs.gov/pp/pp1695/>.

<sup>19</sup> Available at <http://www.epa.gov/owow/nps/natistormwater03/24Miltner.pdf>.

<sup>20</sup> Available at <http://www.bayjournal.com/article.cfm?article=1856>.

<sup>21</sup> In fact, the study anticipates that its results will be useful for future stormwater regulations or management strategies. (Coleman (2005), at ii.)

<sup>22</sup> While more sensitive than other regions’ streams, the data for southern California streams “forms a relationship very similar in shape to the enlargement curves developed for other North American streams.” (Coleman (2005), at iv.)

(*Id.* at iv.) The study was based on stream sites in Ventura to Orange Counties. (*Id.* at iii.) There are 984 miles of ephemeral and intermittent streams in the San Juan Creek Watershed, the same type of stream sites that the study is based upon. (U.S. Army Corp of Engineers, *Draft EIR for San Juan Creek and Western San Mateo Creek Watersheds Special Area Management Plan (SAMP)* (2005), at 4.1-50; see also San Diego Basin Plan, at Table 2-2 (stating that Orange County watersheds include numerous small tributaries and “intermittent coastal streams”).)<sup>23</sup> Indeed, the study makes a point that “most” of the smaller streams in arid or semi-arid climates are ephemeral or intermittent, because of the lack of rainfall events. (Coleman (2005), at 1.) The Basin Plan echoes this point, stating that, “Most of the streams of the San Diego Region are interrupted in character having both perennial and ephemeral components due to the rainfall pattern and the development of surface water impoundments.” (San Diego Basin Plan, at 1-11). In light of the clear relevancy of the 3% threshold to the Draft Permit region, the failure to include a 3% maximum allowable EIA is an illegal omission.

It is important to note that a 3% maximum allowable EIA protects against two effects stemming from increasing impervious cover: (1) even relatively small elevated flows, as well as large ones, erode stream channels, adding sediment load and destroying habitat and riparian vegetation; and (2) adding volume adds pollutant loading, since loading is the multiple of pollutant concentration and water volume. (Letter from R. Horner to J. Robertus (Jan. 24, 2008), at 1-2.) In other words, increased runoff picks up potentially harmful pollutants and carries them into receiving waters, resulting in degraded water quality. (Michael Mallin, *Wading in Waste*, *Scientific American* (June 2006), at 54-56; NRDC, *Rooftops to Rivers: Green Strategies for Controlling Stormwater and Combined Sewer Overflows* (2006) at 2.2-2.5; GAO, *Better Data and Evaluation of Urban Runoff Programs Needed to Assess Effectiveness* (June 2001), at 4, 12-13; U.S. EPA *Preliminary Data Summary of Urban Storm Water Best Management Strategies* (Aug. 1999), at 85; NRDC, *Stormwater Strategies: Community Responses to Runoff Pollution* (1999).) So, even if hydromodification were not a concern—which is not the case—increase in impervious cover is a crucial concept to the control of pollutants to water bodies. Because the Draft Permit must impose “controls to reduce the discharge of *pollutants* to the maximum extent practicable” (33 U.S.C. § 1342(p)(3)(B)(iii) (emphasis added)), evidence indicating LID’s ability to reduce pollutant loads, as well as effects of hydromodification, is particularly relevant to its applicability.

Evidence in the record demonstrates that a maximum allowable EIA of 3% results in superior pollutant limitation compared to the provisions in the Draft Permit. As discussed in our August 22, 2007 letter, a technical report by Dr. Horner shows that in five out of six case studies, the 3% maximum EIA approach results in *all* storm water discharges being eliminated under expected meteorological conditions. (Horner, R., *Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (“LID”) for Ventura County* (2007), at 15.) “Therefore pollutant additions to receiving waters would also be eliminated.”

<sup>23</sup> Available at <http://www.swrcb.ca.gov/rwgcb9/programs/basinplan.html>.

(*Id.*) In another example, in Prince George's County, Maryland, a development using LID techniques resulted in less runoff, that contained 36% less copper, 21% less lead, and 37% less zinc than conventional watershed runoff. (EPA, *Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices* (2007), at 24.) By contrast, the Draft Permit allows for nearly all pollutant loading to be discharged through conventional "treat and release" BMPs which, Dr. Horner has demonstrated, do not even approximate the technical performance of an EIA approach.

The technical report by Dr. Horner shows that the 3% maximum EIA approach is feasible, practicable, and cost-effective, and can result in as much as 100% runoff capture on-site. Moreover, the approach was taken by the Los Angeles Regional Water Board in the draft municipal stormwater permit for Ventura County. (Draft NPDES Permit No. CAS004002 (Aug. 28, 2007), at 51 (requiring all New Development and Redevelopment Projects to reduce the percentage of Effective Impervious Area (EIA) to less than 5 % of total project area).) This information, as well as the myriad of articles and reports demonstrating the superiority of LID submitted into the record by NRDC and Defend the Bay, supports the finding that limiting EIA to 3% in Priority Development Projects is the most effective, feasible BMP. Yet the Draft Permit, instead of aiming for success, is an example of the "prevailing problem [] that the current construct of many stormwater regulations do not require the use of the best available technologies." (Low Impact Development Center, *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption* (2007), at 10.) Making matters worse, staff have offered no substantive response in the Fact Sheet and Response to Comments as to why this approach was not taken in the Draft Permit. Because MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive, the rejection of this approach without explanation means the Draft Permit is not MEP.

**E. At a Minimum, the Drat Permit Must Include an Objective Performance Standard.**

Even assuming, contrary to the evidence in the record, that the Regional Board could lawfully omit a 3% limitation on directly connected impervious surface in new and redevelopment projects, the wholesale omission of *any* articulated standard is unlawful and inconsistent with MEP. Indeed, in addition to the legal flaws vagueness introduces, as discussed above, with respect to site design the Draft Permit follows an approach that has been criticized in a recent publication released by the State Water Resources Control Board on this very subject. The December 2007 report, titled "A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption," emphasizes the role of performance standards and observes that language quite similar to that used in the Draft Permit does not specify a "level of compliance." (*Id.* at 4.) Also, the Director of the Water Division of EPA Region IX has recently indicated that clear performance standards in MS4 permits is critically important. (Letter from A. Strauss to R. Briggs (Feb. 8, 2006) (criticizing failure of Monterey Region SWMP to "target identified priorities or establish

measurable goals”).) Stormwater expert Dr. Richard Horner similarly has stated that the failure to include an objective performance standard means he is “unable to discern what level of performance, and concomitant beneficial water resources impact, will result” from the Draft Permit. (Letter from R. Horner to J. Robertus (Jan. 24, 2008), at 1.) By contrast, Dr. Horner—who is currently a member of a National Academy of Sciences panel on the control of urban runoff—states that a “critical element of any successful program to implement LID and hydromodification in a NPDES MS4 permit context is the specification of a clear permit standard.” (*Id.*)

Further, the findings in the Fact Sheet do not support the failure to include an objective performance standard. Notably, lack of specificity in previous permits has been found to be directly related to lack of permit compliance and, in turn, water quality violations. (Fact Sheet, at 8.) This Draft Permit purports to fix this problem by striking “a balance between flexibility and enforceability.” (Fact Sheet, at 12.) Clearly, the Draft Permit treads well beyond appropriate flexibility to the effect that it would essentially be impossible to measure compliance with, or enforce, the Draft Permit. “[F]lexibility should not be built into the program to such an extent that all municipalities do not face essentially the same responsibilities and commitment for achieving the goals of the CWA.” (55 Fed. Reg. at 48,038.)

Even in 2002, when last permit was adopted, studies had shown that the “level of imperviousness in an area strongly correlates with the quality of nearby receiving waters.” (Fact Sheet, at 31, 51.) As discussed above, more recent research can pinpoint a specific threshold above which water quality degradation and the effects of hydromodification can be seen. In light of the well-documented connection between impervious surface quantity and receiving water quality, the Draft Permit’s refusal to set any maximum EIA for new development and redevelopment projects all but endorses biological and chemical degradation.

**F. The Lack of Clear Control Measures Unlawfully Precludes Meaningful Review by the Board and Public.**

The failure to include an objective performance standard or clear requirements for site design and Low Impact Development further violates the Clean Water Act by precluding required agency and public review of permit conditions. Notably, the Draft Permit not only fails to support that review now, but it does not even require it later: while Copermitees must update permit documents to include site design criteria, the updated SUSMPs are not required to come back to the Board or public for review. (Draft Permit ¶ D.1.d.(9-10).)

The Ninth Circuit has emphasized that a storm water management plan, which “contain[s] the substantive information about how the operator of a small MS4 will reduce discharges to the maximum extent practicable,” is an inherent part of the storm water permit. (*Environmental Defense Center v. EPA*, 344 F.3d 832, 857-58 (9th Cir. 2003; *see also*

*Waterkeeper Alliance v. U.S. EPA*, 399 F.3d 486, 500 (2d Cir. 2005).) The Regional Board's role in ensuring this is achieved is critical:

[S]torm water management programs that are designed by regulated parties must, in every instance, be subject to meaningful review by an appropriate regulating entity to ensure that each such program reduce the discharge of pollutants to the maximum extent practicable.

(*EDC*, 344 F.3d at 856; *Waterkeeper Alliance*, 399 F.3d at 501-502 (discussing importance of review of management plans for concentrated animal feeding operations).) Meaningful review must mean *ensuring* that the MS4 permits are *in fact* designed to reduce pollutants in stormwater to the MEP. (33 U.S.C. § 1342(b) (States are allowed to issue NPDES permits only where, *inter alia*, the state permitting programs “*apply, and insure compliance with, any applicable [effluent limitations and standards].*”)) The Fact Sheet acknowledges that, “The final determination regarding whether a municipality has reduced pollutants to the MEP can only be made by the Regional Board or the State Board, and not by the municipal discharger.” (Fact Sheet, at 38.) Without this regulatory oversight to ensure that the program contains specificity to meet legal requirements, the program amounts to “impermissible self-regulation.” (*EDC*, 344 F.3d at 843.)

Here, the combination of vague permit terms that do not meet MEP, and cannot be meaningfully reviewed, and the failure to require review of any specific measures later developed to implement the concepts contained in the Draft Permit, amounts to the *de facto* creation of an impermissible self-regulatory program. There is nothing to stop a Copermittee from “misunderstanding or misrepresenting its own stormwater situation and proposing a set of minimum measures for itself that would reduce discharges by far less than the maximum extent practicable.” (*EDC*, 344 F.3d at 855.) Indeed, the record indicates that there is every reason to suspect that this is precisely what will happen. According to staff, in the past “Copermittees have generally approved low removal efficiency treatment control BMPs without justification or evidence that use of higher efficiency treatment BMPs was considered and found to be infeasible. . . . Specifically, it has been found during audits of the Copermittees’ SUSMP programs that many SUSMP reports do not adequately describe the selection of treatment control BMPs.” (Fact Sheet, at 95.) Clearly, these findings do not support the open-ended and vague structure of the Draft Permit, which fails to allow for adequate review by the Regional Board or the public, now or in the future.

Remarkably, the Fact Sheet also downplays the importance of urban runoff management plans due to the alleged specificity of the Permit. “Urban runoff management plans are not necessary for ensuring compliance with the Order because the Order itself contains sufficient detailed requirements to ensure that compliance with discharge prohibitions, receiving water limits, and the narrative standard of MEP are achieved.” (Fact Sheet, at 42). As explained above, the Draft Permit in fact does not contain sufficiently detailed requirements—it lacks objective performance standards such that compliance can be

objectively measured. Accordingly, the law and the facts show that the adoption of the Draft Permit as structured would unlawfully establish a self-regulatory program.

### **III. The Hydromodification Provision Suffers the Same Flaws as the Site Design Requirements.**

The Draft Permit provides for “management measures within each Priority Development Project to protect downstream beneficial uses and prevent adverse physical changes to downstream stream channels.” (Draft Permit ¶ D.1.h.(3).) Like the site design requirements, this section suffers the fatal flaw of being too vague to meet the MEP standard, or to ensure compliance with water quality standards.

The vague direction to “protect” beneficial uses and “prevent” adverse physical changes does not specify the actions a Copermittee must take to actually meet the MEP standard. (Draft Permit ¶ D.1.h.(3).) By contrast, this same Regional Board recently approved the San Diego Permit which requires an objective performance standard for hydromodification. That permit requires that a hydromodification plan be implemented so that “post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations.” (Order R9-2007-0001, at ¶ D.1.g.) Thus, there is a baseline level (pre-project runoff) that can be objectively measured. “Matching pre- and post-development rates and volumes from relatively small to relatively large storms is important for two reasons: (1) even relatively small elevated flows, as well as large ones, erode stream channels, adding sediment load and destroying habitat and riparian vegetation; and (2) adding volume adds pollutant loading, since loading is the multiple of pollutant concentration and water volume.” (Letter from R. Horner to J. Robertus (Jan. 24, 2008), at 1.)

The Draft Permit also requires each Copermittee to revise its SUSMP/WQMP to implement updated hydromodification criteria within three years. Yet, like the site design requirements, Copermittees are not required to submit the updated criteria to the Board or public for review. Similarly, the standard against which the criteria are to be judged is a yet-to-be released study conducted by a third party, one that has not been reviewed by staff or other stakeholders and whose ultimate form and conclusions cannot be known at this time. (See Draft Permit ¶ D.1.h.(4) (“Criteria must be based upon findings from hydromodification publications produced by the Stormwater Monitoring Coalition (SMC) and Southern California Coastal Water Research Project (SCCWRP).”) For the same reasons discussed in Section II(E), this flaw amounts to an impermissible self-regulatory program which renders the Draft Permit illegal. It further suffers from each of the other legal flaws described above.

### **IV. Other Permit Provisions Suffer the Same Flaws as the Site Design Requirements and Hydromodification Provision.**

The impermissible vagueness of the site design requirements and hydromodification provision is not limited to these two sections of the Draft Permit; rather, the problem

manifests itself throughout the entire document. Each of the legal problems identified above, therefore, applies and is incorporated by reference here.

The Draft Permit essentially directs Copermittees to develop their own permit, which will not be subject to public review or Board oversight. In this way, the provisions represent a “plan to develop a plan,” rather than any form of plan in itself. Examples of offending sections include:

- Approval Process Criteria and Requirements for all Development Projects;<sup>24</sup>
  - The Copermittee must implement source control BMPs that “reduce storm water pollutants of concern in urban runoff” and result in the “minimization of irrigation runoff”; site design BMPs to “...maximize infiltration, provide retention, slow runoff, minimize impervious footprint...”; infiltration and groundwater protection treatment control BMPs that are “appropriate to protect groundwater quality”; and to develop a mechanism for the long term maintenance of structural post-construction BMPs.
- SUSMPs - Approval Process Criteria and Requirements for Priority Development Projects;<sup>25</sup>
- BMP Implementation for the Construction Component;<sup>26</sup>
- General BMP Implementation for Existing Municipal Developments;<sup>27</sup>
  - The section instructs Copermittees to implement “pollution prevention methods,” designate minimum BMPs that are “area or activity specific as appropriate,” and, designate enhanced measures for 303(d) impaired water bodies or construction sites within, adjacent to, or discharging to coastal lagoons, the ocean, or other receiving waters in environmentally sensitive areas.
- BMP Implementation for Management of Pesticides, Herbicides, and Fertilizers;<sup>28</sup>
  - Copermittees must “reduce the contribution of pollutants associated with the application, storage, and disposal of pesticides, herbicides, and fertilizers” by an unspecified amount. The section additionally calls for the development of schedules for irrigation and chemical application. While an explicit “schedule

---

<sup>24</sup> Draft Permit ¶ D.1.c.

<sup>25</sup> Draft Permit ¶ D.1.d.

<sup>26</sup> Draft Permit ¶ D.2.d.(1).

<sup>27</sup> Draft Permit ¶ D.3.a.(2).

<sup>28</sup> Draft Permit ¶ D.3.a.(3).

of compliance” meets the definition of a BMP under 40 C.F.R. § 122.2, this conditionless requirement to develop a schedule does not constitute a BMP.

- BMP Implementation for Flood Control Structures;<sup>29</sup>
- BMP Implementation for Sweeping of Municipal Areas;<sup>30</sup>
  - Directs the Copermittee to “optimize pickup of trash and debris” based on various factors.
- General BMP Implementation for Existing Commercial/Industrial Developments;<sup>31</sup>
- BMP Implementation for Mobile Businesses;<sup>32</sup>
- BMP Implementation for a Residential Program;<sup>33</sup>
- Common Interest Areas (CIA) / Homeowner Association (HOA) Areas;<sup>34</sup>
- Prevent and Detect Illicit Discharges and Connections;<sup>35</sup>
- Public Participation Component;<sup>36</sup>
  - Provides only that “the Copermittee must incorporate a mechanism for public participation.”
- Watershed Strategy: Evaluation and Selection of Management Options;<sup>37</sup>
- BMP Implementation and Assessment for the Watershed Urban Management Program.<sup>38</sup>

---

<sup>29</sup> Draft Permit ¶ D.3.a.(4).

<sup>30</sup> Draft Permit ¶ D.3.a.(5).

<sup>31</sup> Draft Permit ¶ D.3.b.(2).

<sup>32</sup> Draft Permit ¶ D.3.b.(3).

<sup>33</sup> Draft Permit ¶ D.3.c.(2).

<sup>34</sup> Draft Permit ¶ D.3.c.(5).

<sup>35</sup> Draft Permit ¶ D.4.a.

<sup>36</sup> Draft Permit ¶ D.5.

<sup>37</sup> Draft Permit ¶ E.1.d.

<sup>38</sup> Draft Permit ¶ E.1.e.

**V. The Failure to Include Provisions That Are Required in Other Permits, Without Adequate Explanation, Is a Failure to Meet MEP.**

**A. Similarities Between San Diego County and South Orange County Raises the Presumption that BMPs Included in the San Diego Permit are Applicable in the Draft Permit.**

The Fact Sheet for the Draft Permit explains that,

To achieve the MEP standard, municipalities must employ whatever BMPs are technically feasible (i.e., are likely to be effective) and are not cost prohibitive. The major emphasis is on technical feasibility. Reducing pollutants to the MEP means choosing effective BMPs, and rejecting applicable BMPs only where other effective BMPs will serve the same purpose, or the BMPs would not be technically feasible, or the cost would be prohibitive.

(Fact Sheet, at 37; *see also* SWRCB Water Quality Order No. 2000-11, at 20.) Yet, the Draft Permit fails to require feasible, cost-effective, applicable BMPs that have been recently adopted by this same Regional Board in neighboring San Diego County. (See Table 1.) These critical omissions mean the Draft Permit clearly fails to meet the MEP standard.

South Orange County and San Diego County are substantially similar to the extent that the applicability of BMPs in the San Diego permit raises the presumption that those BMPs are applicable in South Orange County. The two regions are located along the southern California coastline, separated only by the Camp Pendleton Marine Base. Both are Phase I regions regulated by the San Diego Regional Water Board, which issued previous MS4 permits for both regions. According to the San Diego Basin Plan, the San Diego Region, including South Orange County, is typified by a coastal low-lying band about 10 miles wide giving way in the east to foothills, then mountains. (Basin Plan, at 1-3.) Both areas share the same mild, semi-arid climate with the same rainfall, and thus runoff, patterns. (*Id.*)

Orange and San Diego Counties have virtually the exact same populations: the state of California estimates Orange County's population as of 2007 to be 3,098,121 people, behind San Diego County by 148 people. (State of California, Department of Finance, *E-1 Population Estimates for Cities, Counties and the State with Annual Percent Change — January 1, 2006 and 2007* (May 2007).)<sup>39</sup> Both areas have high projected growth and development rates; for example North San Diego County "has one of the highest present and

---

<sup>39</sup> Available at <http://www.dof.ca.gov/HTML/DEMOGRAP/ReportsPapers/Estimates/E1/E-1text.php>.

projected growth rates in the [San Diego] County,” while similarly neighboring South Orange County experiences a “more rapid rate of increase [in housing inventory]” due to the “availability of large tracts of vacant land for development in the South Orange County submarket.” (Compare San Diego County Grand Jury 2001-2002, *Transportation in North County* (June 11, 2002), at EWP2-1, with U.S. Dept. of Housing and Urban Development, *Analysis of the Orange County, California, Housing Market* (Jan. 1, 2004), at 7.)<sup>40</sup>

Further, both regions have documented, and generally similar, water quality impairments, and in both cases stormwater runoff is a leading, or the leading, source of impairment. (Compare Fact Sheet, at 10, with Fact Sheet for Order No. R9-2007-0001, at 8 (stating that significant urban runoff challenges remain in both regions).) For example, like in Orange County, urbanization and development in San Diego County has resulted in the degradation of many stream channels. (Development of Interim Hydromodification Criteria Pursuant to Order R9-2007-0001 (Oct. 30, 2007), at 1-2.)<sup>41</sup> Bioassessment data reveals “Poor to Very Poor Index of Biotic Integrity” ratings for channels and streams in both regions. (Compare Fact Sheet, at 10, with Fact Sheet for Order No. R9-2007-0001, at 61.) These similarities raise a presumption that all BMPs that were included in the San Diego Permit are also applicable in South Orange County.

Yet, important BMPs relating to LID and hydromodification that were included in San Diego have been omitted from the Draft Permit. In this sense, the Draft Permit is not just *different* than the San Diego Permit, it is demonstrably *weaker* than the San Diego Permit. First, the Draft Permit fails to include a provision that is in the San Diego Permit that requires that the Copermittees to update their SUSMPs to “maximize the use of LID practices and principles . . . as a means of reducing stormwater runoff.” (Order No. R9-2007-0001, at ¶ D.1.d.(8).) This is an important difference. Although both Counties’ permits have similar *minimum* site design, or LID, BMP requirements, only San Diego includes this additional provision designed to *maximize* the use of LID. The Draft Permit does not explain how this BMP is not applicable, nor does it explain why it is not justified in South Orange County. Thus, the Draft Permit fails to meet even its own articulation of the MEP standard.

Second, the Draft Permit allows for an optional “LID Site Design BMP Substitution Program,” whereby a Copermittee may substitute LID BMPs for treatment control BMPs. It is unclear why San Diego explicitly requires LID BMPs while the Draft Permit offers an optional LID program. The fact that the Draft Permit distinguishes between the required

---

<sup>40</sup> Available at <http://co.san-diego.ca.us/cnty/cntydepts/safety/grand/northtrans.doc>;  
<http://www.huduser.org/Publications/PDF/OrangeCtyCAComp-2.pdf>.

<sup>41</sup> Available at  
[http://www.projectcleanwater.org/pdf/susmp/interim\\_hydromodification\\_criteria\\_10-30-07.pdf](http://www.projectcleanwater.org/pdf/susmp/interim_hydromodification_criteria_10-30-07.pdf).

“site design” BMPs and the optional “LID” BMPs, but while only defining the term “LID,”<sup>42</sup> makes it clear that Draft Permit does not actually require LID. Further, one requirement of the substitution program is that it must “clearly exhibit that it will achieve equal or better runoff quality from each Priority Development Project which participates in the program.” (Draft Permit ¶ D.1.d.(8).) It is also unclear why this type of quantifiable standard is a requirement in the San Diego Permit, but is only included in the optional program in the Draft Permit. This difference also emphasizes that the Draft Permit does not require performance equal to that suggested by Dr. Horner.

Third, San Diego requires that Copermittees develop and implement a Hydromodification Plan (HMP). The goal of the HMP is to ensure that, for all Priority Development Projects, “post-project runoff discharge rates and durations shall not exceed estimated pre-project rates and durations where the increased discharge rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the discharge rates and durations.” (Order No. R9-2007-2001, at ¶ D.1.g.) This hydromodification criteria is included in the San Diego Permit despite the fact that hydromodification resulting from development and urbanization has already affected San Diego stream channels. (See Fact Sheet for Order No. R9-2007-0001, at 61.) Indeed, hydromodification criteria was deemed an important part of the San Diego permit in part “due to the ongoing high level of development in San Diego County.” (*Id.* at 62.) Because of similar development growth in South Orange County, (*see* Sections I, IV, *infra*) a comparable hydromodification standard is equally applicable in that region.

Yet, inexplicably, the Draft Permit does not require the development of an HMP. More importantly, the same type of quantifiable standard as is required in the San Diego Permit is not included in the Draft Permit. Rather, the Draft Permit requires only that Copermittees develop and apply requirements to Priority Development Projects “so that runoff discharge rates, durations, and velocities from Priority Development Projects are controlled to maintain or reduce downstream erosion conditions and protect stream habitat.” (Draft Permit ¶ D.1.h.) As discussed in Section III herein, this vague standard fails to ensure that MEP or water quality standards will be met. The failure to include the same objective performance standard that was included in the San Diego Permit, without explanation or justification, presents *per se* evidence that the Draft Permit does not meet the MEP standard.

---

<sup>42</sup> The Draft Permit defines LID as, “A storm water management and land development strategy that emphasizes conservation and the use of on-site natural features integrated with engineered, small-scale hydrologic controls to more closely reflect pre-development hydrologic functions.” “Site design BMP” is not defined.

Table 1. Significant differences between San Diego Permit and South Orange County Draft Permit, Site Design Requirements and Hydromodification.

San Diego Final Permit	Southern Orange County Draft Permit
“Establish minimum standards to maximize the use of LID practices and principles . . . as a means of reducing stormwater runoff.” (D.1.d.(8))	Not required
Submit for review an updated Model SUSMP to add LID and source control BMPs that meet or exceed the Permit requirements. (D.1.d.(7-8))	Not required
“Promote” infiltration at Priority Development Projects (D.1.d.(4))	Not required
Develop a Hydromodification Plan with a stated and clear minimum standard. (D.1.g.)	Not required
Establish a HMP standard that will protect beneficial uses: ensure that “post-project runoff discharge rates and durations shall not exceed estimated pre-project rates and durations where the increased discharge rates and durations will result in increased potential for erosion or other significant adverse impacts to beneficial uses, attributable to changes in the discharge rates and durations.” (D.1.g.)	Not required

In addition to the significant differences discussed above, the Draft Permit inexplicably eliminates a host of other BMPs that were in the San Diego Permit. For example:

- Construction Inventory: “The new San Diego Permit requires monthly updates.”
- Construction Reporting: “The new San Diego Permit reporting requirements include more focus on confirming Permit compliance.”
- Municipal Inventory: “The new San Diego Permit requires annual updates.”

- Sweeping of Municipal Areas: "The new San Diego Permit requires that a sweeping program be implemented and specifies frequencies based on local priority determinations."
- Commercial/Industrial Inspections: "The new San Diego Permit requires that inspections be conducted annually at 100 percent of high priority sites and that inspections of other sites increase to 25 percent after the first year."
- Annual Reporting: "The new San Diego Permit reporting requirements include more focus on confirming Permit compliance."
- Reporting: "The new San Diego Permit includes reporting on TMDL implementation. It also requires that more specific details be reported regarding BMP implementation."
- Reporting: "The new San Diego Permit requires reports on Regional Urban Runoff Management Programs."

(MS4 Permit Comparison chart.)

#### **B. The Presumption of Applicability Has Not Been Rebutted by the Board.**

According to the Board's own definition of MEP, these applicable BMPs can only be rejected where other effective BMPs will serve the same purpose, the BMPs are not technically feasible, or the cost is prohibitive. There are in fact some BMPs that are included in the Draft Permit that were not in the San Diego permit, but these BMPs are primarily limited to Section F (Fiscal Analysis) and Section G (Program Effectiveness Assessment). (See MS4 Permit Comparison chart.) They are not BMPs designed to address LID or hydromodification, and therefore do not serve the same purpose as the omitted BMPs.

Further, there is no evidence that the BMPs are not technically feasible or cost prohibitive or otherwise inapplicable based on supportable factual differences. There are no findings in the Draft Permit or statements in the Fact Sheet to that effect, that even attempt to justify failing to include these applicable BMPs: Thus, the Draft Permit blatantly fails to meet the Board's own description for reducing pollutants to the MEP.

#### **VI. The Regional Board Has Failed to Follow Public Participation Regulations.**

Throughout the entire drafting process for the Draft Permit, Board staff has not fulfilled its obligation to review and respond to public comment, resulting in an abrogation of the Board's public participation responsibilities.

State agencies carrying out activities under the NPDES permit program "shall provide for, encourage, and assist the participation of the public." (40 C.F.R § 25.3(a).) State agencies are required to engage the public in order to assure that "the public has the

opportunity to understand official programs and proposed actions” and that “government action is as responsive as possible to public concerns”; to “encourage public involvement in implementing environmental laws”; and to “foster a spirit of openness and mutual trust among EPA, States, substate agencies and the public.” (40 C.F.R. § 25.3(e).) In particular, state agencies are charged with “seeking input from . . . the public, assimilating public viewpoints and preferences, and demonstrating that those viewpoints have been considered by the decision-making official.” (40 C.F.R. § 25.3(b).) In order to ensure that public viewpoints are given due consideration, the agency responding to public comment must:

summarize the public’s views, significant comments, criticisms and suggestions; and set forth the agency’s specific responses in terms of modifications of the proposed action or an explanation for the rejection of proposals made by the public.

(40 C.F.R. § 25.8.)

As we noted in our letter to the Board dated August 22, 2007, no justification or explanation has been provided for staff’s decision to eliminate the LID practices that were included by it in the San Diego Permit. Moreover, NRDC provided the Board with overwhelming evidence establishing that specific performance standards, like the 3% maximum allowable EIA, are the most effective in reducing the discharge of pollutants in stormwater; NRDC sent the Board over 100 reports and articles on June 20, 2006, in connection with our comments on the San Diego Permit, that discussed the benefits of LID. And, again as we noted previously, Board staff failed nearly wholesale to acknowledge NRDC’s and Defend the Bay’s extensive comments to the first draft of this Permit, or submitted technical materials and reports. In its first Response to Comments, staff acknowledged NRDC and Defend the Bay’s comments only one time in a cursory fashion, and nowhere did staff address, or even make reference to, our comments on LID. Worse, when NRDC subsequently submitted an expert report by Dr. Richard Horner in combination with our August 22 letter, both were for all intents and purposes disregarded by Board staff.

Staff’s failure to meaningfully consider and respond to comments submitted by environmental public interest organizations, which included technically sophisticated comments submitted by urban runoff expert Dr. Horner, violates the law and diminishes public confidence in the Regional Board. By failing to address these comments and the supplemental materials provided, the Board fails to assure that “government action is as responsive as possible to public concerns” or to promote a sense of trust between the Board and the public it ostensibly serves. These failings serve instead to create an atmosphere of distrust and cynicism in the public, fomenting public antipathy towards, rather than collaboration with, Board action.

**VII. Conclusion**

As these comments indicate, the Draft Permit requires significant improvements before it is approved. NRDC and Defend the Bay are opposed to its approval in its current form. We would welcome a discussion with staff regarding changes to the Draft Permit that would allow us to support it. Please feel free to contact us at 310-434-2300.

Sincerely,



David S. Beckman  
Natural Resources Defense Council



Robert Caustin  
Defend the Bay



Michelle Mehta  
Natural Resources Defense Council

cc: Alexis Strauss, Director, Water Division, EPA Region IX

**RICHARD R. HORNER, PH.D**

230 NW 55<sup>TH</sup> STREET  
SEATTLE, WASHINGTON 98107

TELEPHONE: (206) 782-7400  
FACSIMILE: (206) 781-9584  
E-MAIL: rhorner@msn.com

January 24, 2008

John Robertus, Executive Officer  
San Diego Regional Water Quality Control Board  
9174 Sky Park Court, Suite 100  
San Diego, CA 92123

Dear Mr. Robertus:

I have reviewed the Draft Permit language for South Orange County regarding Low Impact Development (referred to in the permit as "site design") and hydromodification. In my experience, a critical element of any successful program to implement LID and hydromodification in a NPDES MS4 permit context is the specification of a clear performance standard. The proposed language in the Draft Permit does not include this element nor does it provide any requirements for such performance standards to be promptly developed subject to review by the Regional Water Board and interested members of the public. Further, as noted in the study the Low Impact Development Center recently completed in cooperation with the State Water Resources Control Board, *A Review of Low Impact Development Policies: Removing Institutional Barriers to Adoption* (December 2007), the maximum extent practicable (MEP) standard lends itself to adoption of clear performance standards in these areas, making the absence of these standards particularly problematic. Based on the Draft Permit language regarding LID and hydromodification, and based on my expertise in this field, I am unable to discern what level of performance, and concomitant beneficial water resources impact, will result from these provisions, as proposed.

A specific performance standard is particularly important where, as in South Orange County, significant development with the potential to adversely impact downstream physical habitat and biological integrity is slated to occur. Due to the "availability of large tracts of vacant land for development in the South Orange County submarket," the region experiences a "more rapid rate of increase [in housing inventory]."<sup>1</sup> The County recently approved 14,000 new housing units for construction on 23,000 acres of previously undeveloped land (the Rancho Mission Viejo project), and

---

<sup>1</sup> U.S. Dept. of Housing and Urban Development, *Analysis of the Orange County, California, Housing Market* (Jan. 1, 2004), at 7, available at <http://www.huduser.org/Publications/PDF/OrangeCtyCAComp-2.pdf>.

a 4,000 home subdivision is planned near Irvine Ranch.<sup>2</sup> It is also projected that more than 35,000 housing units will be added in Orange County between 2005 and 2035.<sup>3</sup>

In order to avoid additional degradation of downstream channels, and to protect biological productivity, physical habitat, and other beneficial uses, effective impervious area should be capped at no more than three percent. An important southern California study shows that adverse effects to physical habitat and biological integrity of receiving waters are observed at two to three percent impervious cover in associated catchments, and are already pronounced by the point that impervious cover reaches five percent.<sup>4</sup> The results of this study reveal a threshold that is lower for the semi-arid region of southern California than for comparably-sized sites in more humid climates.<sup>5</sup> The study is applicable to the South Orange County region—there are 984 miles of ephemeral and intermittent streams in the San Juan Creek Watershed, the same type of stream sites that the study is based upon.<sup>6</sup> These southern California streams “appear to be more sensitive to changes in TIMP [total basin impervious cover] than streams in other areas.”<sup>7</sup> Moreover, a numeric threshold of three percent impervious cover has been noted in many studies throughout the United States as the threshold above which hydromodification and water quality impacts can occur.<sup>8</sup> Given the unique resources in South Orange County

---

<sup>2</sup> Rancho Mission Viejo, “The Ranch Plan,” available at <http://www.ranchomissionviejo.com/ranchplan/faqs.php>; The Irvine Company, “East of Orange,” available at <http://www.eastoforange.com/news/faqs.asp>.

<sup>3</sup> Center for Demographic Research, Orange County Profiles, *Orange County Projections 2006: Population, Housing and Employment Through 2035* (March 2007), available at <http://www.fullerton.edu/cdr/profilesv12n1.pdf>.

<sup>4</sup> Coleman, D., et al., *Effect of Increases in Peak Flows and Imperviousness on the Morphology of Southern California Streams*, Southern California Coastal Water Research Project Technical Report #450 (2005); Horner, R., *Investigation of the Feasibility and Benefits of Low-Impact Site Design Practices (“LID”) for Ventura County* (2007), Attachment A.

<sup>5</sup> Coleman, *supra* note 4, at 54.

<sup>6</sup> U.S. Army Corp of Engineers, *Draft EIR for San Juan Creek and Western San Mateo Creek Watersheds Special Area Management Plan (SAMP)* (2005), at 4.1-50.

<sup>7</sup> Coleman, *supra* note 4, at iv.

<sup>8</sup> See, e.g., Marshall, E., et al., *Urban development impacts on ecosystems* (2005), at 66; Conway, T., *Impervious surface as an indicator of pH and specific conductance in the urbanizing coastal zone of New Jersey, USA*; 85 *Journal of Environmental Management* 308-316 (2007); Eight Mile River Watershed Management Plan, at Appendix 9(i); Taylor, B., K. Ludwa, and R. Horner, *Urbanization Effects on Wetland Hydrology and Water Quality: Proceedings of the Third Puget Sound Research Meeting*, Puget Sound Water Quality Authority, Olympia, WA (1995).

John Robertus, Executive Officer

January 24, 2008

Page 3

and plans to develop currently open land areas in the region, adoption of an EIA standard that is the most protective of streams in southern California is crucial.

Aside from the utility of an EIA standard in protecting biological communities and physical habitat, my own investigations in southern California (San Diego and Ventura Counties) demonstrate that this level of on-site storm water management performs in a manner that is superior to traditional best management practices when it comes to water quality. This means that a permit that requires priority development projects to implement LID scaled to attain three percent EIA will reduce a greater quantity of pollutants of concern than will the existing "SUSMP" requirements contained in the Draft Permit. My investigations demonstrate that a three percent EIA standard is also feasible, as LID scaled to meet this standard can be implemented at a wide range of development projects in southern California. I understand that my San Diego and Ventura reports have been separately submitted for your review.

With respect to hydromodification, the standard should be that post-development peak flow rates and volumes shall not exceed the modeled peak flow rates and volumes with pre-European settlement native land cover for all storms from the channel-forming event to the 100-year frequency stream flow. Matching pre- and post-development rates and volumes from relatively small to relatively large storms is important for two reasons: (1) even relatively small elevated flows, as well as large ones, erode stream channels, adding sediment load and destroying habitat and riparian vegetation; and (2) adding volume adds pollutant loading, since loading is the multiple of pollutant concentration and water volume. Presently, the Draft Permit does not include this basic standard and it appears to postpone to the future the possibility of additional detail to manage the impacts of hydromodification.

Sincerely,



Dr. Richard R. Horner



**STATE ADDS ALMOST 470,000 IN 2006; 2007 POPULATION NEARS 37.7 MILLION**

FOR IMMEDIATE RELEASE:  
May 1, 2007

**CONTACT:** Daniel Shaya (City Estimates)  
Linda Gage (State & County Estimates)  
(916) 323-4086  
H.D. Faimer  
(916) 323-0648

**SACRAMENTO**— California's population approached 37.7 million persons as of January 1, 2007, according to new population estimates released today by the state Department of Finance.

California, the nation's most populous state, represents 12.5 percent – one out of every eight persons – of the United States population. The state's population grew almost 1.3 percent in 2006 – adding close to 470,000 residents – mirroring the growth pattern of 2005. The state has increased by nearly 3.8 million persons – 11.2 percent – since the last census on April 1, 2000.

The report shows preliminary January 2007, as well as revised January 2006, population data for the state, cities, and counties. Highlights include:

**California Cities:**

- The 2007 report lists 478 California cities, of which 407 gained population, 3 experienced no change, and the remaining 68 lost population. Compared to Finance's previous report, more cities gained population and fewer cities lost population.
- In calendar year 2006, California cities annexed 14,851 housing units from county unincorporated areas, compared to 7,358 annexed units the previous year. This provided additional population to these cities during a down cycle in housing construction. In the previous report, the state added 197,627 housing units compared to 172,068 housing units this year.
- The city of Beaumont in Riverside County experienced the state's fastest growth rate at 21.2 percent. Beaumont gained 2,077 housing units primarily from new construction, and now has a total population of 28,250.
- Substantial increases in both new housing unit construction and/or annexations contributed to the growth of other fast-growing cities. The City of Imperial in Imperial County (15.6 percent), Lake Elsinore in Riverside County (15.4 percent), Porterville in Tulare County (13.9 percent), Lathrop in San Joaquin County (12.7 percent), and Lincoln in Placer County (11.0 percent) were the fastest growing cities following Beaumont. Porterville annexed a large number of housing units last year.
- Large numeric increases include Fontana in San Bernardino County (16,281), San Jose in Santa Clara County (15,757), San Diego in San Diego County (11,212), Bakersfield in Kern County (11,126) and Santa Clarita in Los Angeles County (9,527). All cities in this group added a large number of newly constructed housing units; Bakersfield and San Jose had small annexation activity; while Fontana and Santa Clarita annexed a large number of units.
- Los Angeles - California's largest city - has for the first time surpassed the 4 million mark with a population of 4,018,080. Los Angeles experienced the state's largest numeric increase of 37,658, and added 10,239 housing units.
- Since the April 1, 2000 census, the top four fastest growing cities have been Lincoln in Placer County (233.9 percent), Beaumont and Murrieta in Riverside County (148.2 and 119.6 percent respectively), and Brentwood in Contra Costa County (109.9 percent).

Department of Finance  
Demographic Research Unit  
Population Estimates for California Cities

10 Largest Cities

City	Population January 1, 2007	Percent Change 2006-07
1. Los Angeles	4,018,080	0.9
2. San Diego	1,316,837	0.9
3. San Jose	973,672	1.6
4. San Francisco	808,844	1.1
5. Long Beach	492,912	0.4
6. Fresno	481,035	2.0
7. Sacramento	467,343	2.0
8. Oakland	415,492	1.0
9. Santa Ana	353,428	0.4
10. Anaheim	345,556	0.8

10 Fastest Growing Cities Based on Percent Change

City	Population January 1, 2007	Percent Change 2006-07
1. Beaumont	28,250	21.2
2. Imperial	11,852	16.6
3. Lake Elsinore	47,634	15.4
4. Porterville	51,467	13.9
5. Lathrop	16,479	12.7
6. Lincoln	37,410	11.0
7. Fontana	181,640	9.8
8. San Jacinto	34,345	9.8
9. Orange Cove	10,544	9.4
10. Adelanto	27,139	9.2

10 Fastest Growing Cities Under 300,000 Based on Numeric Population Change

City	Population January 1, 2007	Numeric Change 2006-07
1. Fontana	181,640	16,281
2. Santa Clarita	177,158	9,527
3. Irvine	202,079	7,953
4. Victorville	102,538	7,453
5. Visalia	117,744	6,710
6. Lake Elsinore	47,634	6,363
7. Porterville	51,467	6,297
8. Chico	84,396	5,743
9. Hesperia	85,876	5,658
10. Lancaster	143,818	5,256

**E-1: City/County/State Population Estimates with Annual Percent Change  
January 1, 2006 and 2007**

JURISDICTION	Total Population			JURISDICTION	Total Population		
	1/1/06	1/1/07	Percent Change		1/1/06	1/1/07	Percent Change
<b>California</b>	37,195,240	37,662,518	1.3	<b>Contra Costa (Cont.)</b>			
<b>Alameda</b>	1,509,981	1,526,148	1.1	Concord	123,969	123,519	-0.4
Alameda	74,551	75,254	0.9	Danville	42,719	42,601	-0.3
Albany	16,680	16,764	0.5	El Cerrito	23,289	23,194	-0.4
Berkeley	105,362	106,347	0.9	Hercules	23,647	23,975	1.4
Dublin	41,891	43,630	4.2	Lafayette	24,003	23,953	-0.2
Emeryville	8,538	9,163	7.3	Martinez	36,306	36,179	-0.3
Fremont	210,150	211,862	0.7	Moraga	16,223	16,165	-0.4
Hayward	146,391	147,845	1.0	Oakley	29,485	31,906	8.2
Livermore	81,442	82,845	1.7	Orinda	17,557	17,517	-0.2
Newark	43,486	43,693	0.5	Pincle	19,315	19,234	-0.4
Oakland	411,334	415,492	1.0	Pittsburg	62,492	63,004	0.8
Piedmont	10,998	11,055	0.5	Pleasant Hill	33,203	33,117	-0.3
Pleasanton	67,873	68,755	1.3	Richmond	102,676	103,828	1.1
San Leandro	81,071	81,466	0.5	San Pablo	30,977	30,965	0.0
Union City	71,151	72,297	1.6	San Ramon	58,505	58,035	2.7
Balance Of County	139,043	139,680	0.6	Walnut Creek	65,603	65,384	-0.3
				Balance Of County	165,785	169,927	2.5
<b>Alpine</b>	1,238	1,261	1.9	<b>Del Norte</b>	29,025	29,341	1.1
Balance Of County	1,238	1,261	1.9	Crescent City	7,682	7,762	1.0
				Balance Of County	21,343	21,579	1.1
<b>Amador</b>	38,142	38,435	0.8	<b>El Dorado</b>	176,637	178,674	1.2
Amador	214	214	0.0	Piacerville	10,197	10,237	0.4
Iron	7,616	7,842	3.0	South Lake Tahoe	23,652	23,704	0.2
Jackson	4,351	4,317	-0.8	Balance Of County	142,788	144,733	1.4
Plymouth	1,059	1,050	-0.8				
Sutter Creek	2,943	2,945	0.1	<b>Fresno</b>	899,872	917,515	2.0
Balance Of County	21,959	22,067	0.5	Clovis	89,947	92,269	2.6
				Coalinga	17,276	18,061	4.5
<b>Butte</b>	215,981	218,069	1.0	Firebaugh	6,713	6,692	-0.3
Biggs	1,766	1,769	0.1	Fowler	4,858	5,293	9.0
Chico	78,653	84,396	7.3	Fresno	471,599	481,035	2.0
Gridley	5,914	6,167	4.3	Huron	7,345	7,493	2.0
Croville	13,477	14,443	7.2	Kerman	12,637	13,591	7.5
Paradise	26,366	26,299	-0.3	Kingsburg	11,249	11,234	-0.1
Balance Of County	89,803	84,995	-5.4	Mendota	8,779	9,426	7.4
				Orange Cove	9,641	10,544	9.4
<b>Calaveras</b>	45,623	46,028	0.9	Parlier	12,899	13,080	1.4
Angels City	3,571	3,588	0.5	Reedley	23,348	24,909	6.7
Balance Of County	42,052	42,439	0.9	Sanger	23,326	23,289	-0.2
				San Joaquin	3,748	3,870	3.3
<b>Colusa</b>	21,501	21,951	2.1	Selma	22,937	23,194	1.1
Colusa	5,694	5,773	1.4	Balance Of County	173,570	173,535	0.0
Williams	5,083	5,255	3.4				
Balance Of County	10,724	10,923	1.9	<b>Glenn</b>	28,475	28,815	1.5
				Orland	6,949	7,189	3.5
<b>Contra Costa</b>	1,030,732	1,042,341	1.1	Willows	6,392	6,469	1.2
Antioch	100,183	100,150	0.0	Balance Of County	15,134	15,257	0.8
Brentwood	45,974	48,907	6.4				
Clayton	10,841	10,761	-0.6				

**E-1: City/County/State Population Estimates with Annual Percent Change  
January 1, 2006 and 2007**

JURISDICTION	Total Population			JURISDICTION	Total Population		
	1/1/06	1/1/07	Percent Change		1/1/06	1/1/07	Percent Change
<b>Los Angeles (Cont.)</b>				<b>Marin</b>	253,818	255,982	0.9
Lomita	21,091	21,127	0.2	Belvedere	2,141	2,149	0.4
Long Beach	490,798	492,912	0.4	Corte Madera	9,422	9,465	0.5
Los Angeles	3,980,422	4,018,080	0.9	Fairfax	7,345	7,375	0.4
Lynwood	73,137	73,171	0.0	Larkspur	12,070	12,121	0.4
Malibu	13,680	13,748	0.5	Mill Valley	13,770	13,822	0.4
Manhattan Beach	36,551	36,573	0.1	Novato	51,219	52,426	2.4
Maywood	29,583	29,957	1.3	Ross	2,362	2,379	0.7
Monrovia	39,058	39,309	0.6	San Anselmo	12,450	12,518	0.5
Montebello	85,508	85,686	0.3	San Rafael	57,480	58,047	1.0
Monterey Park	64,471	64,508	0.1	Sausalito	7,411	7,454	0.6
Norwalk	109,822	110,040	0.2	Tiburon	8,840	8,882	0.5
Palmdale	141,199	145,468	3.0	Balance Of County	69,298	69,344	0.1
Palos Verdes Estates	14,060	14,085	0.2	<b>Mariposa</b>	18,142	18,254	0.6
Paramount	57,881	58,087	0.4	Balance Of County	18,142	18,254	0.6
Pasadena	146,327	147,262	0.6	<b>Mendocino</b>	89,834	90,291	0.5
Pico Rivera	67,068	67,074	0.0	Fort Bragg	6,915	6,917	0.0
Pomona	162,055	162,140	0.1	Point Arena	497	496	-0.2
Rancho Palos Verdes	43,045	43,092	0.1	Ukiah	15,849	15,876	0.2
Redondo Beach	67,201	67,495	0.4	Willits	5,043	5,049	0.1
Rolling Hills	1,968	1,972	0.2	Balance Of County	61,530	61,953	0.7
Rolling Hills Estates	8,102	8,099	0.0	<b>Merced</b>	249,114	251,510	2.2
Rosemead	57,220	57,427	0.4	Atwater	27,176	27,618	1.6
San Dimas	36,911	37,011	0.3	Dos Palos	4,932	4,899	-0.7
San Fernando	25,068	25,145	0.3	Gustine	5,236	5,152	-1.6
San Gabriel	42,374	42,691	0.7	Livingston	12,553	13,287	5.8
San Marino	13,498	13,507	0.1	Los Banos	34,053	35,211	3.4
Santa Clarita	167,631	177,158	5.7	Merced	75,854	79,715	5.1
Santa Fe Springs	17,804	17,849	0.3	Balance Of County	86,310	85,628	-0.8
Santa Monica	90,665	91,124	0.3	<b>Modoc</b>	9,715	9,721	0.1
Sierra Madre	11,025	11,039	0.1	Afturas	2,830	2,827	-0.1
Signal Hill	11,105	11,229	1.1	Balance Of County	6,865	6,894	0.1
South El Monte	22,340	22,464	0.6	<b>Mono</b>	13,642	13,985	1.0
South Gate	101,779	102,233	0.4	Mammoth Lakes	7,495	7,560	0.9
South Pasadena	25,708	25,824	0.5	Balance Of County	6,347	6,425	1.2
Temple City	35,517	35,702	0.5	<b>Monterey</b>	423,048	425,960	0.7
Torrance	147,299	148,558	0.9	Carmel-By-The-Sea	4,057	4,053	-0.1
Vernon	95	95	0.0	Del Rey Oaks	1,630	1,626	-0.2
Walnut	32,189	32,297	0.3	Gonzales	8,495	8,737	2.8
West Covina	112,608	112,953	0.3	Greenfield	15,407	16,629	7.9
West Hollywood	37,594	37,653	0.2	King City	11,382	11,518	1.2
Westlake Village	8,872	8,893	0.2	Marina	18,910	18,958	0.3
Whittier	86,955	87,190	0.3	Monterey	30,129	30,121	0.0
Balance Of County	1,094,157	1,092,001	-0.2	Pacific Grove	15,375	15,444	0.4
<b>Madera</b>	145,198	148,721	2.4	Salinas	149,021	149,539	0.3
Chowchilla	17,145	17,827	4.0				
Madera	52,862	55,760	5.5				
Balance Of County	75,161	75,114	-0.1				

**E-1: City/County/State Population Estimates with Annual Percent Change  
January 1, 2006 and 2007**

JURISDICTION	Total Population 1/1/06	Total Population 1/1/07	Percent Change	JURISDICTION	Total Population 1/1/06	Total Population 1/1/07	Percent Change
<b>Sacramento (Cont.)</b>				<b>San Diego (Cont.)</b>			
Gait	23,017	23,459	2.0	Oceanside	174,986	176,644	0.9
Isleton	814	815	0.1	Poway	50,567	50,830	0.5
Rancho Cordova	56,470	59,056	4.6	San Diego	1,305,625	1,316,837	0.9
Sacramento	458,001	467,343	2.0	San Marcos	76,752	79,812	4.0
Balance Of County	561,826	561,951	0.0	Santee	54,727	55,158	0.8
				Soiana Beach	13,331	13,418	0.7
<b>San Benito</b>	57,513	57,803	0.5	Vista	94,473	94,962	0.5
Hollister	37,008	37,120	0.3	Balance Of County	473,658	481,216	1.6
San Juan Bautista	1,722	1,825	6.0				
Balance Of County	18,783	18,858	0.4	<b>San Francisco</b>	800,099	808,844	1.1
				San Francisco	800,099	808,844	1.1
<b>San Bernardino</b>	1,993,983	2,028,013	1.7				
Adelanto	24,863	27,139	9.2	<b>San Joaquin</b>	668,259	679,687	1.7
Apple Valley	67,465	70,297	4.2	Escaion	7,044	7,091	0.7
Barstow	23,710	23,943	1.0	Lathrop	14,827	16,479	12.7
Big Bear Lake	6,178	6,207	0.5	Lodi	62,828	63,395	0.9
Chino	79,709	81,224	1.9	Manteca	63,716	65,076	2.1
Chino Hills	77,920	78,668	1.0	Ripon	13,911	14,575	4.8
Colton	51,747	51,797	0.1	Stockton	285,968	289,789	1.3
Fontana	165,359	181,640	9.8	Tracy	80,477	80,505	0.0
Grand Terrace	12,374	12,380	0.0	Balance Of County	138,890	142,777	2.2
Hesperia	80,218	85,876	7.1				
Highland	51,459	52,186	1.4	<b>San Luis Obispo</b>	262,594	264,900	0.9
Loma Linda	21,896	22,451	2.5	Arroyo Grande	16,557	16,759	1.2
Montclair	35,624	36,622	2.8	Atascadero	27,589	27,778	0.7
Needles	5,876	5,759	1.5	El Paso De Robles	28,896	29,514	2.1
Ontario	171,008	172,701	1.0	Grover Beach	13,179	13,085	-0.7
Rancho Cucamonga	170,372	172,331	1.1	Morro Bay	10,483	10,436	-0.3
Redlands	71,043	71,375	0.5	Pismo Beach	8,597	8,545	-0.6
Rialto	99,130	99,064	-0.1	San Luis Obispo	44,326	44,239	-0.2
San Bernardino	201,899	205,010	1.6	Balance Of County	112,987	114,544	1.4
Twentynine Palms	27,431	24,830	-9.5				
Upland	74,053	75,169	1.5	<b>San Mateo</b>	726,336	733,496	1.0
Victorville	95,085	102,538	7.8	Atherton	7,284	7,423	1.9
Yucaipa	50,523	51,784	2.5	Belmont	25,725	25,897	0.7
Yucca Valley	20,522	21,044	2.5	Brisbane	3,753	3,789	1.0
Balance Of County	308,919	286,978	-4.2	Burlingame	28,408	28,667	0.9
				Coima	1,579	1,593	0.9
<b>San Diego</b>	3,064,113	3,098,269	1.1	Daly City	105,156	106,160	1.0
Carlsbad	98,641	101,337	2.7	East Palo Alto	32,183	32,630	1.4
Chula Vista	223,533	227,723	1.9	Foster City	29,993	30,269	0.9
Coronado	22,898	22,957	0.3	Half Moon Bay	12,775	12,912	1.1
Del Mar	4,525	4,548	0.5	Hillsborough	10,998	11,122	1.1
El Cajon	96,900	97,255	0.4	Menlo Park	30,842	31,146	1.0
Encinitas	62,836	63,259	0.7	Millbrae	20,797	20,965	0.8
Escondido	140,816	141,788	0.7	Pacifica	38,859	39,251	1.0
Imperial Beach	27,572	27,709	0.5	Portola Valley	4,566	4,618	1.1
La Mesa	55,779	56,250	0.8	Redwood City	76,322	77,025	0.9
Lemon Grove	25,371	25,451	0.3	San Bruno	41,645	42,145	1.2
National City	61,123	61,115	0.0	San Carlos	28,352	28,639	1.0

**E-1: City/County/State Population Estimates with Annual Percent Change  
January 1, 2006 and 2007**

JURISDICTION	Total Population			JURISDICTION	Total Population		
	1/1/06	1/1/07	Percent Change		1/1/06	1/1/07	Percent Change
<b>Tehama</b>	60,979	61,774	1.3	<b>Ventura</b>	817,315	825,512	1.0
Coming	7,154	7,179	0.3	Camarillo	64,075	65,601	2.4
Red Bluff	13,529	13,702	1.3	Fillmore	15,170	15,247	0.5
Tehama	434	427	-1.6	Moorpark	35,774	36,150	1.1
Balance Of County	39,862	40,466	1.5	Ojai	8,149	8,133	-0.2
<b>Trinity</b>	14,108	14,171	0.4	Oxnard	189,846	192,997	1.7
Balance Of County	14,108	14,171	0.4	Port Hueneme	22,390	22,347	-0.2
<b>Tulare</b>	420,131	429,006	2.1	San Buenaventura	106,629	107,490	0.8
Dinuba	19,555	20,002	2.3	Santa Paula	29,109	29,182	0.3
Exeter	10,620	10,730	1.0	Simi Valley	122,612	124,524	1.6
Farmersville	10,405	10,466	0.6	Thousand Oaks	127,545	127,739	0.2
Lindsay	11,173	11,174	0.0	Balance Of County	96,016	96,102	0.1
Porterville	45,170	51,467	13.9	<b>Yolo</b>	190,500	193,983	1.8
Tulare	51,417	55,935	8.8	Davis	64,638	64,938	0.5
Visalia	111,034	117,744	6.0	West Sacramento	43,219	44,928	4.0
Woodlake	7,293	7,394	1.4	Winters	6,874	6,885	0.2
Balance Of County	153,464	144,094	-6.1	Woodland	53,016	54,060	2.0
<b>Tuolumne</b>	57,039	57,223	0.3	Balance Of County	22,753	23,172	1.8
Sonora	4,703	4,750	1.0	<b>Yuba</b>	69,198	70,745	2.2
Balance Of County	52,336	52,473	0.3	Marysville	12,775	12,713	-0.5
				Wheatland	3,518	3,513	-0.1
				Balance Of County	52,905	54,519	3.1



**Dan Cloak  
Environmental**



133904.004

**TO:** Sara Agahi, County of San Diego

**CC:** Chris Herencia, Brown and Caldwell; Mike Flake, Brown and Caldwell; Tony Dubin, Brown and Caldwell; Dan Cloak, Dan Cloak Environmental Consulting; Andy Collison, PWA

**FROM:** Nancy Gardiner, Brown and Caldwell

**AUTHORS:** Christie Beeman and Andy Collison, PWA

**REVIEWER:** Tony Dubin, Brown and Caldwell

**DATE:** October 30, 2007

**SUBJECT:** Development of Interim Hydromodification Criteria

---

Regional Water Quality Control Board Order R9-2007-0001 Provision D.1.g (6) (Board Order) requires the County of San Diego and its NPDES Co-permittees to identify Interim Hydromodification Criteria (IHC) within 365 days of Order adoption (i.e., by January 24, 2008). The interim criteria will apply until the final Hydrograph Modification Management Plan (HMP) is implemented. The IHC is described in the order as "an interim range of runoff flow rates for which Priority Development Project post-project runoff flow rates and durations shall not exceed pre-project runoff flow rates and durations." The purpose of the IHC is to prevent development-related changes in stormwater runoff from causing, or further accelerating, stream channel erosion or other adverse impacts to beneficial stream uses. This memorandum provides background on fluvial geomorphology and hydrograph modification management, describes flow control criteria applied in other HMPs, and provides a recommendation for developing the San Diego IHC.

#### GEOMORPHIC CONTEXT

Stream channels form in response to the sediment and runoff delivered from the watershed, in combination with channel slope and underlying geology. In a stable stream channel, water and sediment are in balance so that the channel neither aggrades nor erodes over time, though the channel may adjust dynamically to individual storm events. There are environmental influences that alter channel geomorphology including fire, landslides and tectonic uplift or subsidence. When these changes occur, stream channels adjust over time to achieve a new dynamic equilibrium under the altered conditions.

Anthropogenic land use changes have altered the balance of runoff and sediment supply in many Southern California watersheds, beginning with the introduction of cattle grazing in the 19<sup>th</sup> century. Modern land development tends to increase the rate and volume of runoff delivered to stream channels, due to the increase in impervious surfaces and drainage efficiency. In the Southern and Central coast regions of California, these anthropogenic changes have caused degradation of many

Plans that have been adopted in the Bay Area (Contra Costa, Santa Clara, Alameda) and approaches under consideration in other areas of California (Sacramento, Los Angeles, SCWRPPP) vary as to the emphasis placed on flow control versus other approaches. However, there is a general consensus that both the frequency and duration of flows must be controlled, necessitating the use of continuous simulation hydrologic modeling for evaluating potential impacts of development (as opposed to design storm methods typically used in flood control analysis). It is also generally accepted that events smaller than  $Q_{10}$  are the most critical for hydrograph modification management. The examples below illustrate how different regulatory approaches have led to different compliance criteria.

#### *Flow Control Approach*

Conventional flood control detention basins are designed to control peak flows for large events to pre-project levels and meter the excess runoff out over a longer period. This approach can increase the duration of small but still erosive flows and can cause extensive channel erosion (WA State Department of Ecology, 2001). More recently, detention basins for hydrograph modification management have employed multi-stage outlet works designed to match both the duration and magnitude of flows within a critical range. To avoid the erosive effect of extended low flows, the maximum rate at which excess water is eventually released is set below the erosive threshold. The Santa Clara (SCVURPPP) HMP focused on the use of detention basins for hydrograph modification management and therefore strongly emphasized the lower flow control limit for site runoff. SCVURPPP defined the lower flow control limit as the flow rate (expressed as a percentage of  $Q_2$ ) that generates the critical shear stress on a channel ( $Q_c$ ); that is, the minimum flow that could initiate erosion in the channel bed and banks. SCVURPPP estimated  $Q_c$  to be  $0.1Q_2$ , based on an estimate of bed and bank material shear resistance at selected cross sections in two creeks. As a result of this study, both the Santa Clara and Alameda HMPs adopted  $0.1Q_2$  as the lower limit for flow control regulation.

#### *Low Impact Development (LID) Approach*

The LID approach to hydrograph modification management relies on site design and best management practices to mitigate for hydrograph modification impacts. By minimizing directly connected impervious area and promoting infiltration, LID approaches mimic natural hydrologic conditions to counteract the hydrologic effects of development. Because more water is retained on-site and in distributed facilities, the lower discharge limit is less critical for LID facilities since different facilities will discharge into the stream system at different times. By contrast to the Santa Clara approach, the Contra Costa HMP strongly emphasized the use of LID for hydrograph modification management. The HMP is therefore targeted the range of flows most likely to cause erosion impacts (i.e., less than  $Q_{10}$ ), without defining a specific lower limit for flow control.

#### RECOMMENDATION

The Board Order specifically requires defining a "range of runoff flow rates" to be regulated under the IHC. Runoff flow rates are commonly understood as design storm peak flow rates such as  $Q_2$  or  $Q_{10}$ , and in fact the interim standard recently adopted by the County of Los Angeles consists of a single peak flow rate ( $Q_2$ ). This approach is appealing because it is very simple and can be evaluated using design storm models and methods commonly used for flood control analysis. However, it is widely recognized that the design storm approach is not adequate for characterizing the most critical hydrograph modification effects of development (i.e., increased duration and frequency of small runoff events).

The Order provides for exemptions from the IHC of development projects disturbing 50 acres or more when:

- “(a) The project would discharge into channels that are concrete-lined or significantly hardened (e.g., with rip-rap, sackcrete, etc.) downstream to their outfall in bays or the ocean;
- (b) The project would discharge into underground storm drains discharging directly to bays or the ocean; or
- (c) The project would discharge to a channel where the watershed areas below the project’s discharge points are highly impervious (e.g. >70%).”

In addition, we recommend adding another exemption criterion (currently not written in the permit) to provide some additional flexibility for applicants in complying with the Interim Hydromodification Criteria, as follows:

- (d) The applicant conducts an assessment incorporating sediment transport modeling across the range of geomorphically-significant flows that demonstrates to the permitting agencies satisfaction that the project flows and sediment reductions will not detrimentally affect the receiving water.