

MITIGATION OF STORM WATER IMPACTS FROM NEW DEVELOPMENT IN ENVIRONMENTALLY SENSITIVE AREAS

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INTRODUCTION

The California Regional Water Quality Control Board, Los Angeles Region (LA Regional Board) issued the final version of the Standard Urban Storm Water Mitigation Plan (SUSMP) for the County of Los Angeles and Cities in Los Angeles County on March 8, 2000. As adopted, the SUSMP included locations within or directly discharging to an environmentally sensitive area (EnvSA) as a development category to be subject to SUSMP requirements. The Building Industry Association, Western States Petroleum Association, and 32 cities filed an amended petition to the State Water Resources Control Board (State Board) to appeal certain aspects of the SUSMP. On October 5, 2000, the State Board issued its decision, *In Re: Bellflower et al.* ("SUSMP Decision").¹

Although the SUSMP decision upheld much of the Regional Board's action, it removed EnvSAs as a development category from the SUSMP. The State Board surmised that EnvSAs were not a developmental category, but rather a locational designation. Further, the State Board expressed some concern that no threshold size had been specified that would trigger SUSMP requirements², and that development in EnvSAs may already be extensively regulated. Although the LA Regional Board had proposed a threshold for development within, adjacent to or directly discharging to an EnvSA in its response, the State Board determined that adequate opportunity for discussion of the threshold by interested parties had not been provided.³ In setting aside the EnvSAs, the State Board explained the types of evidence and findings that

¹ SWRCB, 2000. State Board Order No. WQ 2000-11: In the matter of the petitions of the Cities of Bellflower, et al., the City of Arcadia, and Western States Petroleum Association,

² *Ibid.* at page 24.

³ SWRCB, 2000. State Board Order No. WQ 2000-11: In the matter of the petitions of the Cities of Bellflower, et al., the City of Arcadia, and Western States Petroleum Association, page 25.

Regional Boards must make for future inclusion of the category.⁴ The action to set aside EnvSAs was not to be interpreted as precedent setting.

The LA Regional Board intends to insure consistency among the requirements of the different municipal storm water permits it adopts. On July 27, 2000, the LA Regional Board adopted a renewed municipal storm water permit for Ventura County (Ventura County MS4 Permit) (Board Order No. 00-108). The Ventura County MS4 Permit included the Ventura Countywide Stormwater Quality Urban Impact Mitigation Plan (SQUIMP), which is analogous to the SUSMP for Los Angeles County. The Ventura County MS4 Permit requires that that new development controls be implemented for several development categories, including projects sited within, adjacent to or directly discharging to an EnvSA. Like the SUSMP, the SQUIMP requires a suite of water quality-related best management practices (BMPs) intended to minimize impacts from development.

Following issuance of the SUSMP decision, the Ventura County Co-permittees requested to have the language of the Ventura Permit and SQUIMP revised to conform to the changes made to the Los Angeles County SUSMP. In response, the LA Regional Board Executive Officer issued a letter, which changed portions of the Ventura County MS4 Permit language. However these changes did not modify the Ventura County MS4 Permit with respect to the EnvSA language or SQUIMP requirements. Three Ventura County MS4 Permittees petitioned the State Board against the actions of the LA Regional Board Executive Officer in making these changes to the Ventura County MS4 Permit. The State Board and LA Regional Board have held the appeals in abeyance pending the resolution of related issues during the renewal of the LA County MS4 Permit. Until these appeals are resolved, the Ventura County MS4 Permit remains in effect as adopted, including the requirements for projects in EnvSAs.

The California Regional Water Quality Control Board, San Diego Region (SD Regional Board) adopted a Municipal Storm Water Permit for San Diego County and Cities (SD County MS4 Permit) on February 28, 2001. The SD County MS4 Permit designated EnvSAs as a development category to be subject to SUSMPs, and included threshold development size and/or alteration criteria that will trigger the requirements. The threshold criteria were either the creation of 2,500 square feet of impervious surface or increasing the imperviousness of a proposed project site by ten percent above its natural condition.⁵

URBAN STORM WATER RUNOFF AND WATER QUALITY IMPACTS

Urban storm water contains pollutants that degrade water quality and adversely impact aquatic habitat. Pollutants found in storm water include suspended solids, heavy metals and a broad suite of organic compounds including pesticides, nutrients, petroleum compounds, pathogen indicators and other by-products of urban activities.^{6 7} Urban storm water has also been shown to alter water quality parameters such as pH, oxygen demand, specific

⁴ See Memorandum from Craig Wilson, Chief Counsel, State Board to Regional Board Executive Officers dated Dec. 26, 2000.

² California Regional Water Quality Control Board, San Diego Region, San Diego County Municipal Storm Water Permit, Order No. 2001-01, 52 pp.

⁶ Makepeace, D.K., Smith, D.W. and Stanley, S.J., 1995. Urban stormwater quality: summary of contaminant data. *Critical Reviews in Environmental Science and Technology*, 25(2): 93-139.

⁷ Ayers, M.A., Kennen, J.G. and Stackelberg, P.E., 2000. Water quality in the Long Island-New Jersey coastal drainages, New York and New Jersey, 1996-98. U.S. Geological Survey Circular 1201.

conductance, temperature and turbidity.⁸ Finally, urbanization modifies the hydrologic properties of a site, generally leading to increased volumes of runoff from a given amount of precipitation, and a more rapidly developing runoff peak.⁹

These pollutants and hydromodifications can directly result in negative impacts to biota and degrade ecosystems. Metals, organic compounds and other pollutants can have acute and/or chronic toxic effects to aquatic flora and fauna¹⁰, and flow modifications can directly degrade the physical conditions of a habitat through erosion and deposition of sediments.^{11 12} A growing body of research links urban storm water runoff to water quality impairments and habitat degradation.^{13 14} Rivers and tributary streams, lakes, wetlands, estuaries and near shore ocean waters are susceptible to storm water impacts.

Adjacent habitats may be indirectly impacted by the degradation of aquatic areas. Fauna in riparian habitats may be negatively impacted by water quality degradation through reduced aquatic food sources, alteration of reproductive environments and habitat alteration that fosters proliferation of non-native species.

FEDERAL STORM WATER REGULATIONS

Federal storm water regulations require MS4 permittees to control storm water pollution from new developments during and after construction. U.S.EPA guidance advocates preventative measures including development design, implementation and maintenance of structural and non-structural best management practices (BMPs), and adoption of post-construction runoff ordinances.¹⁵

In February 2001, the U.S.EPA issued a Memorandum of Agreement (MOA) between the U.S.EPA, U.S. Fish and Wildlife Service (USFW) and the National Marine Fisheries Service (NMFS). The MOA is designed to enhance coordination of protection of endangered and threatened species pursuant to the Endangered Species Act (ESA) and the Clean Water Act (CWA). EPA believes that a coordinated national approach will insure greater protection for listed species, enhance regulatory predictability, and increase the efficiency of ESA

⁸ Schueler, Tom, 1994. The importance of imperviousness. *Watershed Protection Techniques*, 1(3) 7 pages.

⁹ Booth, D. and Jackson, C.R., 1997. Urbanization of aquatic systems: degradation thresholds, stormwater detention, and the limits of mitigation. *Journal of the American Water Resources Association*, 33(5):1077-1090.

¹⁰ Field, R. and Pitt, R.E., 1990. Urban storm-induced discharge impacts: US Environmental Protection Agency research program review; *Water Science and Technology*, 22(10/11):1-7.

¹¹ Sovern, D.T. and P.M. Washington, 1996. Effects of urban growth on stream habitat. In Roesner, L., ed. Effects of watershed development and management on aquatic ecosystems. ASCE Conference, August 4-9, 1996, Snowbird, Utah.

¹² May, Christopher W.; Horner, Richard R.; Karr, James R.; Mar, Brian W.; Welch, Eugene B., 1997. Effects of urbanization on small streams in the Puget Sound Lowland ecoregion, *Watershed Protection Techniques* 2(4): 483-494.

¹³ Bay, S., Greenstein, D., Jirik, A. and A. Zellers, 1996. Toxicity of Stormwater from Ballona and Malibu Creeks, [Southern California Coastal Water Research Project, Annual Report 1996](#), p. 96-104.

¹⁴ U.S. General Accounting Office, 2001. Water Quality: Better data and Evaluation of Urban Runoff Programs Needed to Assess Effectiveness, USGAO, June 2001.

¹⁵ For a discussion see, Radulescu, D., Swamikannu, X. and P. Hammer, 2001. [Retail gasoline outlets: New development design standards for mitigation of storm water impacts](#). Technical Report, June 2001, California Regional Water Quality Control Board, Los Angeles Region.

consultations.¹⁶

Under the CWA, the Regional Board is responsible for “restoring and maintaining the chemical, physical and biological integrity of the Nation’s waters”. Clearly, the MOA contemplates cooperation and coordination of the Regional Board’s regulatory programs to enhance the relationship between the CWA and the ESA.

In issuing MS4 Permits, the Regional Boards are expected to ensure that all federal requirements are met. New developments that occur in EnvSAs should be required to incorporate into development design and long-term maintenance planning, storm water pollution prevention methods and appropriate BMPs.

ENVIRONMENTALLY SENSITIVE AREAS

California Public Resources Code defines EnvSAs as follows:

"Environmentally sensitive area means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and Development."¹⁷

In the proposed LA County MS4 Permit these include:

- (i) Significant Ecological Areas (SEAs), designated by the County of Los Angeles;
- (ii) Significant Natural Areas (SNAs) designated by the California Department of Fish and Game (CDFG);
- (iii) Rare, Threatened, or Endangered Species (RARE) beneficial use areas listed in the Regional Board Basin Plan, designated by the LA Regional Board; and

For the Ventura County MS4 Permit, the SEA category is substituted with the following because the Ventura County Planning Agency has not performed an equivalent designation,

- (iv) Other Areas identified by the Permittees as environmentally sensitive for water quality purposes.

EnvSAs in the LA County MS4 Permit have been designated through a public process by their designating agencies. SEAs provide a habitat for rare, endangered, or threatened plant and animal species; biotic communities, vegetative associations, and species that are either one of a kind, or are restricted in distribution. These habitats often serve as concentrated breeding, feeding, or resting, or migrating grounds, and is limited in availability. They contain biotic resources that are of scientific interest. Some of these areas are important as game species habitat or fisheries; provide for the preservation of examples of relatively undisturbed natural biotic communities; and areas that are special for other reasons.¹⁸ SNAs are areas that may

¹⁶ USEPA, 2001. Fact Sheet: Memorandum of Agreement between the Environmental Protection Agency, Fish and Wildlife Service and National Marine Fisheries Service regarding enhanced coordination under the Clean Water Act and Endangered Species Act. EPA-823-F-01-003.

¹⁷ See, Cal. Pub Res. Code 30107.5

¹⁸ Los Angeles County Department of Regional Planning, 2000. Los Angeles County Significant Ecological Area update study 2000, Background Report. Prepared for Los Angeles County by PCR Services, Frank Hovore & Associates, and FORMA Systems.

support extremely rare species or habitats, support associations or concentrations of rare species or habitats, or exhibit the best examples of rare species and habitats in California.¹⁹ The RARE beneficial use designation is assigned to “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.

Since most of the selection criteria for EnvSAs involve rare, endangered or threatened species and associated habitat, any negative impact to such areas acquires a higher degree of severity. In these areas, recovery from impacts is inhibited by inherently smaller populations, restricted habitat boundaries, habitat fragmentation, and boundary effects. So, for a given negative stimulus, EnvSAs will experience a potentially greater and less reversible negative response than areas with more abundant and less sensitive species or biotic assemblages. Due to this sensitivity these areas are more easily degraded, therefore they merit a higher standard of protection.

RELATED ENVIRONMENTAL PROTECTION

Selected areas in California already merit a higher standard of protection from development impacts because of location. The California Ocean Plan prohibits the discharge of “waste” to Areas of Special Biological Significance (ASBS), and requires discharges to be located far enough away to allow maintenance of natural water quality conditions in ASBS.²⁰ The State Board recently issued a decision regarding storm water discharges where it determined that discharges to ASBS are prohibited.²¹

In the late 1980s the Sierra Club brought a petition against the County of Los Angeles alleging a failure to conduct an environmental review of a proposed project in a protected habitat area prior to granting project approval, as specified by the Malibu Local Coastal Plan (LCP). The trial court ruling in this case resulted in the creation of an environmental review board (ERB) to regulate development in sensitive environmental resource areas.²² The function of the ERB is to advise decision-makers of the County of Los Angeles to insure that development within sensitive environmental resource areas is consistent with the environmental protection policies of the Malibu LCP. The ERB evaluates proposed projects, makes recommendations, and suggests mitigation measures or conditions to minimize adverse environmental impacts²³. Projects found not to be consistent with the Malibu LCP could presumably be denied a permit.

Relevant policies in the Malibu LCP include:

Policy 86:

¹⁹ Significant Natural Areas website: <http://www.dfg.ca.gov/whdab/html/moresna.html>.

²⁰ SWRCB, 1997. *California Ocean Plan: water quality control plan – ocean waters of California*. California Environmental Protection Agency, Sacramento, California.

²¹ SWRCB, 2001. In the matter of the Petition of California Department of Transportation (Cease and Desist Order No. 00-87 for Crystal Cove), issued by California Regional Water Quality Control Board, Santa Ana Region. SWRCB file A-1350.

²² Sierra Club, et al. , F.P. Angel, Counsel, Vs. County of Los Angeles and Board of Supervisors, C. Moore, Counsel, September 26, 1991, Ronald M. Sohigian, Judge.

²³ Los Angeles County Board of Supervisors, 1986. Malibu Local Coastal Program Land Use Plan.

“A drainage control system, including on-site retention or detention where appropriate, shall be incorporated into the site design of new developments to minimize the effects of runoff and erosion. Runoff control systems shall be designed to prevent any increase in site runoff over pre-existing peak flows. Impacts on downstream sensitive riparian habitats must be mitigated.”

Policy 96:

“Degradation of the water quality of groundwater basins, nearby streams, or wetlands shall not result from development of the site. Pollutants, such as chemicals, fuels, lubricants, raw sewage, and other harmful waste shall not be discharged into or alongside coastal streams or wetlands.”

The California Coastal Act contains provisions for an increased level of protection for resources defined as Environmentally Sensitive Habitat Areas (ESHAs). Cal. Pub. Res. Code § 30240.a states that:

“Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.”

On September 28, 2000, the California Coastal Commission (CCC) sent a letter to the State Board supporting the LA Regional Board’s action in extending SUSMP requirements to EnvSAs.²⁴ Recently in commenting on a draft of the LA County MS4 permit, the CCC reiterated its support for inclusion of EnvSAs.²⁵ The CCC explained that the inclusion of EnvSAs is an important action that would greatly assist the State’s efforts to protect the ecological integrity of land and coastal environments.

THRESHOLDS/EXEMPTIONS

The State Board in the SUSMP decision explained that Regional Boards might extend new development requirements to EnvSAs in the future if thresholds are established after full public discussion.

From a review of exemption criteria for developments in the literature, we note that CEQA uses the criterion of 2,500 square feet of impervious surface area for projects in EnvSAs as the threshold below which there is no environmental review. CEQA categorically exempts from environmental review: single-family residences or second dwelling unit in a residential zone; up to three single-family residences in an urbanized area; a duplex or similar structure in a residential area; apartments or similar structures designed for not more than six dwelling units in an urbanized area; stores, motels, offices or similar structures not using significant amounts of hazardous materials, and not exceeding 2,500 square feet in floor area.²⁶ The CEQA categorical exemption for up to four commercial buildings not exceeding 10,000 square feet of floor area, and not using significant amounts of hazardous materials, applies only if the

²⁴ California Coastal Commission, 2000. Letter dated September 28, 2000, to Craig Wilson, Chief Counsel, SWRCB, from Jaime Kooser, Deputy Director, Energy, Ocean Resources, and Water Quality.

²⁵ See Comment Letter from Jamie Kooser, Deputy Director, California Coastal Commission to Dennis Dickerson, Executive Officer, LA Regional Board dated July 25, 2001.

²⁶ Title 14. California Code of Regulations, Chapter 3. Guidelines for Implementation of the California Environmental Quality Act; Article 19. Categorical Exemptions.

surrounding area is not environmentally sensitive. Commercial facilities less than 10,000 square feet and surrounded by an area that is environmentally sensitive therefore are not exempt from CEQA requirements. The CCC exempts single family residences (subject to conditions for access, water supply, etc.) from requirements for a coastal development permit.²⁷ The SD Regional Board excludes the applicability of new development requirements for development in EnvSAs where the change in impervious surface area is less than ten percent from the natural condition.²⁸ States such as Maryland, Washington, Florida, and Virginia use a threshold of 4,000 square feet or 5,000 square feet of disturbed land area for new development requirements to apply, but do not have a separate threshold for projects in EnvSAs although they require a stricter performance standard.

Although, we were unable to find an express basis in the legislative record for the CEQA threshold of 2,500 square feet of impervious area, it is reasonable to assume that the threshold derives from the typical impervious surface footprint of a single-family residential home (less than 2,500 square feet). Similarly, the typical single family lot size (less than 5,000 square feet) may be the basis of the threshold for the application of new development controls in other States. The SD Regional Board's alternative criteria of ten percent change from the natural condition appears to be based on scientific studies in the Mid-West and Pacific-Northwest which demonstrated that a more than ten percent change in impervious cover of watershed resulted in visible change to the ecological health of streams. Highly urbanized watersheds such as those in Los Angeles County usually have more than 50 percent impervious cover.

From our review of the scientific and regulatory literature, it is clear that environmental law and policy on development controls have been often framed to avoid imposing regulatory obligations on the individual homebuilder and/ or homeowner. A threshold for development in EnvSAs based on a similar objective appears to be reasonable.

DESIGN STANDARDS

The SUSMP requires the implementation of a suite of BMPs for developments, to mitigate adverse environmental impacts due to storm water and urban runoff. The suggested BMPs are designed to reduce the pollutant load in runoff and impacts from increased runoff volume and flow rates. Examples of BMPs include design elements such as clustering development, preserving existing vegetated areas, covering exposed pollutant sources and minimizing impervious surfaces, and treatment devices including detention or retention basins, oil/water separators, and filter systems.

The SUSMP does not prescribe specific BMPs, but does provide flow-based and volume-based criteria for runoff treatment. The choice of BMP or combination of BMPs is left to local control as long as the Maximum Extent Practicable (MEP) standard is met.

²⁷ California Public Resources Code, 30610.1. (a) Prior to certification of the applicable local coastal program, no coastal development permit shall be required for the construction of a single-family residence on any vacant lot meeting the criteria set forth in subdivision (c) and located in a specified area designated by the commission pursuant to subdivision (b).

²⁸ SD County MS4 Permit (Board Order No. 2001-01) at p. 16

ECONOMIC CONSIDERATION

BMPs required as part of the implementation of the SUSMP and SQUIMP will have economic impacts. Some BMPs would be implemented in most developments even if they were not explicitly required by regulation, including protection of slopes and channels and covered and contained trash and material storage areas. Other BMPs will be implemented only because they are required, and therefore potentially have a greater economic impact.

Economic impact will be case-specific and will depend on many factors. Studies about storm water BMP cost show that the size, type of development, existing environment, geology, and climate can affect the choice of BMP and its cost.²⁹ For example, an infiltration basin may be appropriate if the substrate is permeable, and groundwater contamination is not likely, whereas a biofiltration system that releases to the surface may be appropriate if the substrate is impermeable, or if sensitive groundwater resources are close to the surface. However, by imposing water quality requirements on the development at the design stage, cost savings can be maximized.

Clustered housing may save money on infrastructure, while minimizing the addition of impervious surface. Cost savings from alternative residential development designs have been estimated to be from 39–63% over conventional designs.³⁰ Commercial developments may demand certain parking space requirements, but water quality requirements can be met by pervious pavement, vegetative treatment swales, or water quality basins. Construction costs for storm water treatment BMPs for a five-acre commercial development have been estimated to range from \$5,000 to \$60,000 depending on the selected BMP. If water quality requirements are factored into the initial planning and design phase, total cost can be minimized and water quality benefits maximized.

JUSTIFICATION

The State Board excluded developments sited within, adjacent to, or directly discharging to EnvSAs from SUSMP requirements primarily because, it may have been mis-categorized as developmental rather than “locational”, the absence of a threshold, the lack of adequate consideration by interested parties, and concerns of extensive regulation.

The LA Regional Board at this time, after nearly 12 months of public review for comment on three drafts, has provided ample opportunity for all interested parties to comment on the proposed criteria and its basis. By the nature of the designation of EnvSAs as a category to provide enhanced protection for, the basis is locational and identified as such under the Cal. Pub. Res. Code. § 30107.5. We propose a threshold of 2,500 square feet of impervious surface area or more as a threshold to trigger SUSMP requirements for projects in EnvSAs. On the issue of extensive regulation, we submit that most of the existing regulations regarding EnvSAs, are intended to exclude development entirely or limit allowed activities within the area but seldom for water quality protection. For developments that will be allowed, it is the responsibility of the State Board and Regional Boards to require effective mitigation of impacts from storm water and urban runoff and ensure at the same time that their actions do not harm

²⁹ Center for Watershed Protection, 1998. Cost and Benefits of Storm Water BMPs, Final Report 9/14/98, Prepared for Parsons Engineering Science, EPA Contract 68-C6-0001.

³⁰ *Ibid.*

the natural resources of California.

We recommend a threshold of 2,500 square feet or more to trigger the SUSMP requirements for developments in EnvSAs. Developments that create less than 2,500 square feet of impervious area will not require a SUSMP, developments that create 2,500 square feet of impervious surface or more will require a SUSMP. Staff also proposes that the redevelopment (i.e. creation, addition, and replacement) of single-family structures (including those in EnvSAs) be excluded from SUSMP requirements.³¹ Permittees may consider the threshold of altering the imperviousness cover to ten or more percent over the natural condition as an alternative approach when they submit a watershed or a regional plan for consideration by the Regional Board as a substitute for site-by-site SUSMP requirements.

CONCLUSION

EnvSAs are inherently sensitive habitats containing unique, rare, threatened or endangered species and/or assemblages of species. Their unique and sensitive nature merits a higher standard of environmental protection than more common areas with common and abundant species. Storm water and urban runoff are known to contain a wide range of pollutants and have demonstrated toxicity to plants and animals. Therefore it is necessary to mitigate impacts from storm water and urban runoff to the MEP for developments within or directly discharging to EnvSAs. Applying SUSMP requirements to these developments is feasible and can be accomplished by a range of BMPs that can be tailored to the size and type of a particular development. The recommended threshold of 2,500 square feet of impervious area for application of SUSMP requirements in EnvSAs is reasonable and consistent with current principles of environmental law and policy. The most effective and economic way to accomplish the mitigation of storm water pollution from new development is to identify and implement water quality control techniques at the planning and design stage rather than require post-construction retrofits.

³¹ State of Maryland exempts existing single family structures from new development/ re-development standards, Storm Water Design Manual 2000 at p 1.13